

Continuing Planning Process

State of Minnesota's
Water Quality Management Program



Minnesota Pollution Control Agency

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Introduction

The state of Minnesota has abundant water resources – more than 12,200 lakes and 105,000 miles of rivers and streams. There are eight major basins and 81 major watersheds. Minnesota is home to Lake Superior, the world's largest freshwater lake by surface area and Voyageurs National Park, the largest water-based park in the National Park System. Minnesota's waters flow outward in three directions: north to Hudson Bay in Canada, east to the Atlantic Ocean, and south to the Gulf of Mexico. Water recreation makes up a large part of the state's tourism revenue, with many opportunities for fishing, canoeing and kayaking, and visiting numerous federal and state parks.

The Minnesota Pollution Control Agency (MPCA), the State's environmental regulatory agency, is charged by the U.S. Environmental Protection Agency (EPA) to operate the State's water program and carry out the requirements of the Clean Water Act. Following a statewide water management process, the MPCA executes this charge by setting standards, monitoring water quality, developing restoration and protection strategies, and finally, permitting implementation activities and carrying out prevention and assistance activities.

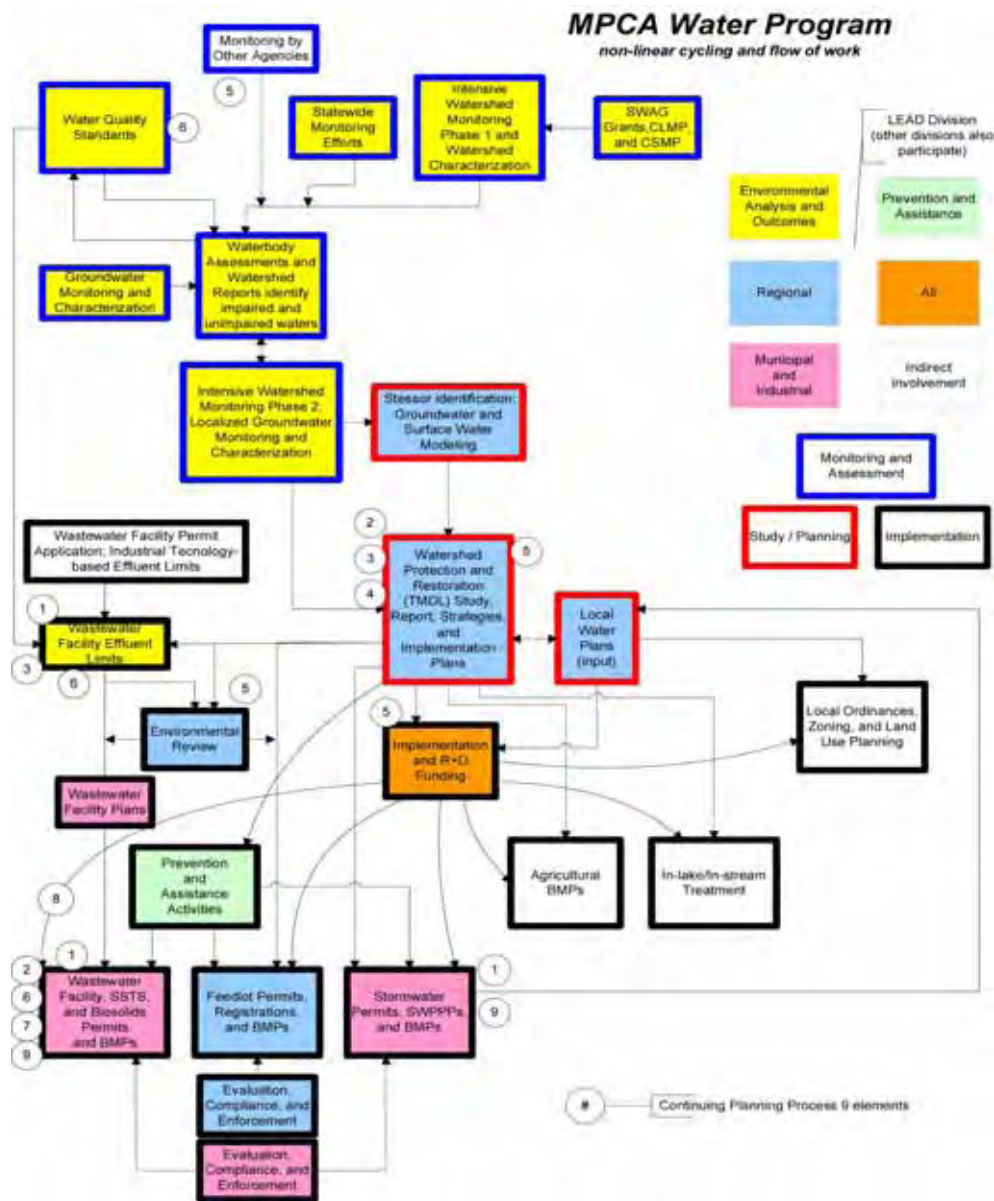
Continuing Planning Process

Section 303(e) of the Clean Water Act (CWA) requires each state to have a Continuing Planning Process (CPP) document describing the processes and procedures it uses in water quality planning. The objective of the state CPP is to establish a management program and provide a framework for establishing programmatic commitments and goals that will be contained in the Environmental Performance Partnership Agreement (EnPAA) and other plans prepared pursuant to the Clean Water Act. The purpose of the CPP is to document how the state will make its water quality management decisions. Nine specific processes must be addressed in each state's CPP. These nine processes are listed below:

1. A process for developing effluent limitations and schedules of compliance at least as stringent as those required by sections 301(b) (1) and (2), 306 and 307, and at least as stringent as any requirements contained in applicable water quality standards in effect under the authority of section 303 of the CWA.
2. A process for incorporating elements of any applicable area-wide waste treatment plans under section 208, and applicable basin plans under section 209 of the CWA.
3. A process for developing Total Maximum Daily Loads (TMDLs) and individual water quality-based effluent limitations for pollutants in accordance with section 303(d) of the CWA and section 40 CFR § 130.7(a).
4. A process for updating and maintaining Water Quality Management Plans, including schedules for revision.
5. A process for assuring adequate authority for intergovernmental cooperation in the implementation of the state Water Quality Management program.
6. A process for establishing and assuring adequate implementation of new or revised water quality standards, including schedules of compliance, under section 303(c) of the CWA.
7. A process for assuring adequate controls over the disposition of all residual waste from any water treatment processing.
8. A process for developing an inventory and ranking, in order of priority of needs for construction of waste treatment works required to meet the applicable requirements of sections 301 and 302 of the CWA.
9. A process for determining the priority of permit issuance.

This document is organized by the MPCA's non-linear cycling and flow of work, as illustrated below. Each of the nine processes can be found on the diagram, denoted throughout the narrative information in the document, and in a matrix in Appendix A.

The Minnesota Pollution Control Agency's (MPCA) Water Forum and Assistant Commissioner for Water Policy approved the CPP on December 16, 2010. The MPCA Citizens Board is to review the CPP in January 2011.



Minnesota Pollution Control Agency organization

Minnesota Pollution Control Agency's mission: Working with Minnesotans to protect, conserve and improve our environment and enhance our quality of life, the Minnesota Pollution Control Agency (MPCA) monitors environmental quality, offers technical and financial assistance, and enforces environmental regulations. Additionally, the MPCA works with many partners — citizens, communities, businesses, all levels of government, environmental groups, and educators — to prevent pollution and to conserve resources.

Agency structure

Approximately 900 staff work at eight offices throughout Minnesota in eight different divisions. All divisions include water program work:

- The Environmental Analysis and Outcomes Division (EAO) monitors and assesses the physical, chemical and biological conditions of Minnesota's environment, establishes water quality standards and sets effluent limits.
- The Regional Division manages watershed protection and restoration activities through planning, monitoring, modeling, community engagement, plan development and implementation. The division also manages the feedlot and environmental review programs.
- The Municipal Division works with cities, towns, counties and other jurisdictions to ensure proper management of wastewater, stormwater and solid waste. Work includes technical assistance, development of rules and policy, permitting, and compliance and enforcement.
- The Industrial Division operates the agency's core regulatory programs that work with larger industrial facilities to ensure they are in compliance with air quality, water quality and hazardous waste regulations.
- The Prevention and Assistance Division (PAD) focuses on voluntary, innovative environmental approaches, including pollution prevention, and technical and financial assistance, to develop comprehensive system-based approaches to environmental problems and supports the agency's information and knowledge management systems.
- The Remediation Division operates programs that clean up pollution including programs for Voluntary Investigation and Cleanup (VIC), Superfund, closed landfills, petroleum remediation, and the Emergency Response Team. The Brownfields Program cleans up abandoned land sites contaminated by industry so they can be safely redeveloped.
- The Data and Performance Management Division develops and implements the data and performance management systems of the agency.
- The Operational Support Division works to enable management of resources (people, dollars, and knowledge) toward the Agency's current and future priorities by providing a framework for linking resources to the vision.

An agency organizational chart can be found in Appendix B.

The MPCA employs an assistant commissioner for water policy who oversees the Water Forum, which reviews statewide water policy and operational issues. Other water teams include the Water Manager's Group, which coordinates the agency's water program activities; the Water Quality Monitoring Leadership Team; the Water Communications Team, which sponsors regular presentations for staff to learn about and to discuss water-related topics; and the Watershed Project Manager's Group, which provides information and training to staff and fosters discussion of various approaches and methods in carrying out watershed projects.

Agency governance

The MPCA receives operating guidance from the MPCA Citizens' Board, which makes decisions on certain environmental review and regulatory issues and the MPCA Commissioner, who directs the work of MPCA staff and serves as chair of the Citizens' Board. More information can be found at:

www.pca.state.mn.us/index.php/about-mpca/mpca-overview/mpca-citizens-board/mpca-citizens-board.html.

Regulatory authority

Authority for the MPCA's water quality programs and responsibilities is derived from numerous state and federal legislative mandates.

The major federal authority for the state's water quality programs are found in sections of the Clean Water Act (CWA). Many of these Clean Water Act mandates have been delegated by the U.S. Environmental Protection Agency (EPA) to the state.

The major authority for state water quality programs is found in both Minnesota statutes and the State of Minnesota Rules. Minnesota Statutes Chapters 115 and 116 established the Minnesota Pollution Control Agency and provide the agency with broad authorities to write rules, establish standards, enforce pollution laws and investigate waters of the state.

For a complete description of these mandates, see Appendix C.

Environmental Performance Partnership Agreement

The Environmental Performance Partnership Agreement (EnPPA) is an agreement between the MPCA and the EPA, Region 5. The agreement specifies how the two agencies will jointly protect Minnesota's environment. The objective of this initiative is to strengthen the protection of public health and the environment by directing scarce resources toward the most pressing environmental needs. It was also designed to provide states with flexibility in how they achieve environmental results and enhance their accountability in achieving environmental progress. The EnPPA sets specific goals, objectives, and outcome measures that the agencies will achieve together. For more information, visit: www.pca.state.mn.us/index.php/about-mpca/mpca-overview/agency-strategy/environmental-performance-partnership-agreement-enppa.html?menuid=&missing=0&redirect=1.

Strategic plan

The MPCA's strategic plan, last revised in 2008, charts the agency's direction for the next several years. It contains a balance of goals and objectives reflecting the agency's regulatory work (permitting, inspections, compliance, enforcement) and its nonregulatory work (monitoring and assessment, planning) as well as agency aspirations needed to better align results with its mission. The MPCA's vision for water is that Minnesota has clean, sustainable surface and groundwater. Specific goals to help reach this vision include:

- Assessing the condition of Minnesota's groundwater systems and providing information on the effectiveness of best management practices in preventing and reducing degradation of groundwater and supporting groundwater conservation.
- Assessing the chemical, physical and biological integrity of Minnesota's lakes, streams and wetlands to identify if designated uses are being met, and providing information on the condition of waters.
- Protecting and improving the chemical, physical and biological integrity of Minnesota's lakes, streams and wetlands.

Minnesota Pollution Control Agency's water program

The MPCA water program is a comprehensive program that integrates the work of all water protection, management and restoration functions within the MPCA. This comprehensive approach to water-related activities helps the agency prioritize and focus efforts to effectively manage water resources throughout the state.

A vision of clean, sustainable surface and groundwater is a key focus of the MPCA's strategic plan. To realize this objective, it is imperative that the agency coordinates work across functional areas in the most efficient way possible. The agency uses its water program to guide a holistic approach to developing and implementing appropriate water protection, management and restoration techniques.

The water program incorporates many functional areas from across the agency, including: adoption and management of water quality standards, water monitoring and assessment; restoration (Total Maximum Daily Load [TMDL]) and protection studies; regulation of wastewater, stormwater and feedlots; environmental review and pollution prevention. Programs outside of the water program that regulate storage, treatment, disposal, and clean-up of wastes and products also help protect and restore water resources; programs include management of hazardous waste and solid waste, site assessment and remediation, and regulation of storage tanks. Additionally, the MPCA conducts rulemaking activities that involve proposing new rules and rule changes. The rulemaking process involves the public and other interested parties for comments on proposed rules, specifically in the water program, permit related rules, fee rules, and Subsurface Sewage Treatment Systems Program (SSTS) rules.

Water program funding

The MPCA water program is funded through a variety of state and federal sources. In general, sources of funding for the MPCA FY2010-11 budget include:

- Appropriation from the General Fund is six percent.
- The Environmental Fund is the largest source of funding, at about 35 percent.
- The Remediation Fund is the second largest source of funding, at about 21 percent.
- Federal funds pay for 12 percent (includes Federal Stimulus funds).
- The Clean Water Fund covers 14 percent (Clean Water Amendment).
- Other sources cover 12 percent (includes Miscellaneous Special Revenue).

Many of the agency's priority programs fall in the water program area. An overview of the MPCA's water programs funding information can be found at: www.pca.state.mn.us/index.php/about-mpca/mpca-overview/agency-strategy/financial-transparency/financial-transparency-at-the-mpca.html.

Minnesota's Clean Water Legacy Act and the Clean Water, Land and Legacy Amendment

When the MPCA began addressing impaired waters in the late 1990s, only a small percentage of the state's waters had been monitored and assessed, though the list of impairments to the state's waters was already extensive and growing. The MPCA managers and its partners felt a growing concern that the agency's water budget would not be able to adequately address the Clean Water Act's requirement to assess all waters of the state, list waters that do not meet standards and conduct TMDL studies in order to set pollutant reduction goals needed to restore waters.

In January 2002, the Minnesota Legislative Auditor, in its program evaluation, *Minnesota Pollution Control Agency Funding*, recognized the existence of a significant under-funded Federal Clean Water Act requirement and recommended the agency report to the 2003 Legislature on "plans for implementing and financing 'total maximum daily load requirements.'"

In March 2003, the MPCA submitted this report to the Legislature entitled, *Minnesota's Impaired Waters*. The Legislature responded by requiring the MPCA to report back in February 2004 on the, "status of discussions with stakeholders on strategies to implement the impaired waters program and any specific recommendations on funding options to address the needs documented in the agency's 2003 report."

Minnesota's Governor also weighed in on the impaired waters issue. At a policy forum in June 2003, Governor Pawlenty unveiled his clean water vision for Minnesota, urging stakeholders to join together for the development of a new clean water initiative. He announced his administration's commitment to finding a long-term source of funding for these efforts.

Hearing the Legislature and Governor's recommendations, the MPCA initiated an impaired waters stakeholder process to bring agriculture, environmental, business, and local government representatives together, along with a number of state agencies. Their task was to develop policy and funding recommendations to address Minnesota's impaired waters. This group became known as the "Group of 16" or "G16." Key principles of their policy recommendations included:

- Focus resources on cleaning up pollution instead of expanding bureaucracy.
- Provide resources to existing organizations and programs rather than creating new ones.
- Encourage local leadership in implementation and accountability, along with state level coordination.
- Protect clean water while also restoring polluted waters.
- Guarantee that a diversity of perspectives is represented in the effort by creating the Clean Water Council.

In 2005, the Minnesota Court of Appeals reversed the MPCA's issuance of a permit for a new joint wastewater treatment plant for the Cities of Annandale and Maple Lake. The court based its decision on the fact that waters downstream of the new plant were impaired. The court of appeals' decision made dozens of other projects throughout Minnesota uncertain. Although the Minnesota Supreme Court ultimately reinstated the Annandale/Maple Lake permit, the court of appeals' decision sparked a new urgency around the impaired waters problem. In response, the stakeholders developed a draft "ramp-up" budget recommendation of \$40 million to launch Clean Water Legacy in FY2007, combined with an ongoing, annual \$80 million base appropriation.

Passage of the Clean Water Legacy Act

In 2006, Minnesota's Clean Water Legacy Act (CWLA) was passed and accelerated the State down a path toward addressing impaired waters by assessing the quality of lakes, rivers and streams, and increasing the number of Total Maximum Daily Load (TMDL) studies initiated as required by the Federal Clean Water Act. An initial appropriation for FY2007 was followed by a nearly \$54 million appropriation for FY2008-2009. These funds were intended to increase monitoring and assessment and start a new number of TMDL studies and restoration and protection projects. The MPCA received just over \$31 million of the overall appropriation, split between monitoring and assessment (\$12.6 million plus \$375,000 for an endocrine disruptor study) and TMDL development (\$18 million). The CWLA can be found at www.revisor.mn.gov/bin/getpub.php?pubtype=stat_chap&year=current&chapter=114d.

Additionally, the Clean Water Council was created to provide advice to the legislative and executive branches of government on the administration and implementation of the CWLA and to facilitate coordination between stakeholders. More information on the Clean Water Council can be found at www.pca.state.mn.us/index.php/about-mpca/mpca-overview/councils-and-forums/clean-water-council/clean-water-council.html?menuid=&missing=0&redirect=1.

Development and passage of the Clean Water, Land and Legacy Amendment

Following the passage of the CWLA, stakeholders wanted to ensure a long-term source of sustainable funding for restoring and protecting Minnesota's waters. A further campaign with additional stakeholders resulted in a ballot initiative to amend Minnesota's Constitution.

On November 4, 2008, Minnesota voters approved the Clean Water, Land and Legacy Amendment to *protect drinking water sources; to protect, enhance, and restore wetlands, prairies, forests, and fish, game, and wildlife habitat; to preserve arts and cultural heritage; to support parks and trails; and to protect, enhance, and restore lakes, rivers, streams, and groundwater.*

The Amendment *increased the sales and use tax rate by three-eighths of one percent on taxable sales, starting July 1, 2009, continuing through 2034.* Of those funds, approximately 33 percent is dedicated to a Clean Water Fund to protect, enhance, and restore water quality in lakes, rivers, streams, and groundwater, with at least five percent of the fund targeted to protect drinking water sources. In the 2009 Legislative session, the MPCA received approximately \$51.16 million for the FY2010-11 biennium from the newly-created Clean Water Fund.

Partnerships to protect Minnesota's waters¹

The MPCA and six other agency partners collaborate on Minnesota's water resource management activities under the Clean Water Fund:

- Minnesota Department of Natural Resources (www.dnr.state.mn.us/news/features/amendment.html)
- Minnesota Department of Agriculture (www.mda.state.mn.us/)
- Minnesota Department of Health (www.health.state.mn.us/divs/eh/cwf/index.html)
- Minnesota Board of Water and Soil Resources (www.bwsr.state.mn.us/cleanwaterfund/)

¹ **CPP Element 5:** A process for assuring adequate authority for intergovernmental cooperation in the implementation of the state Water Quality Management program.

- Minnesota Public Facilities Authority (www.deed.state.mn.us/Community/assistance/pfa.htm)
- Metropolitan Council (www.metrocouncil.org/environment/WaterSupply/cleanwaterfund.htm)

Additionally, these agencies collaborate with the University of Minnesota's Water Resources Center (<http://wrc.umn.edu/watersustainabilityframework/index.htm>) and other higher education water institutes and centers like the Water Resources Center at Minnesota State University, (Mankato), the Energy and Environment Resources Center at the University of North Dakota and the Natural Resources Research Institute and the University of Minnesota (Duluth). The agencies also coordinate with local units of government for conservation delivery on-the-ground.

Past funding from the CWLA further enabled state agencies to efficiently coordinate water-quality monitoring and assessment, TMDL development, and water restoration and protection projects. Partnerships continued to grow stronger when the agencies formed the Clean Water Fund Interagency Coordination Team, established for the purposes of:

- Coordinating state agency clean water activities to achieve Clean Water Fund outcomes.
- Coordinating and leveraging funding opportunities to achieve Clean Water Fund purposes.
- Enhancing institutional knowledge for future water management activities.
- Providing consistent Clean Water Fund information for public use, reporting and administrative procedures.

Coordination Team members represent the perspectives of their organization and serve as spokespersons for the coordination team within the agency/organization that they represent. The team employs systematic strategies for the 25-year life of the Amendment funding, using existing programs to avoid adding additional bureaucratic layers and to eliminate duplicating water management activities.

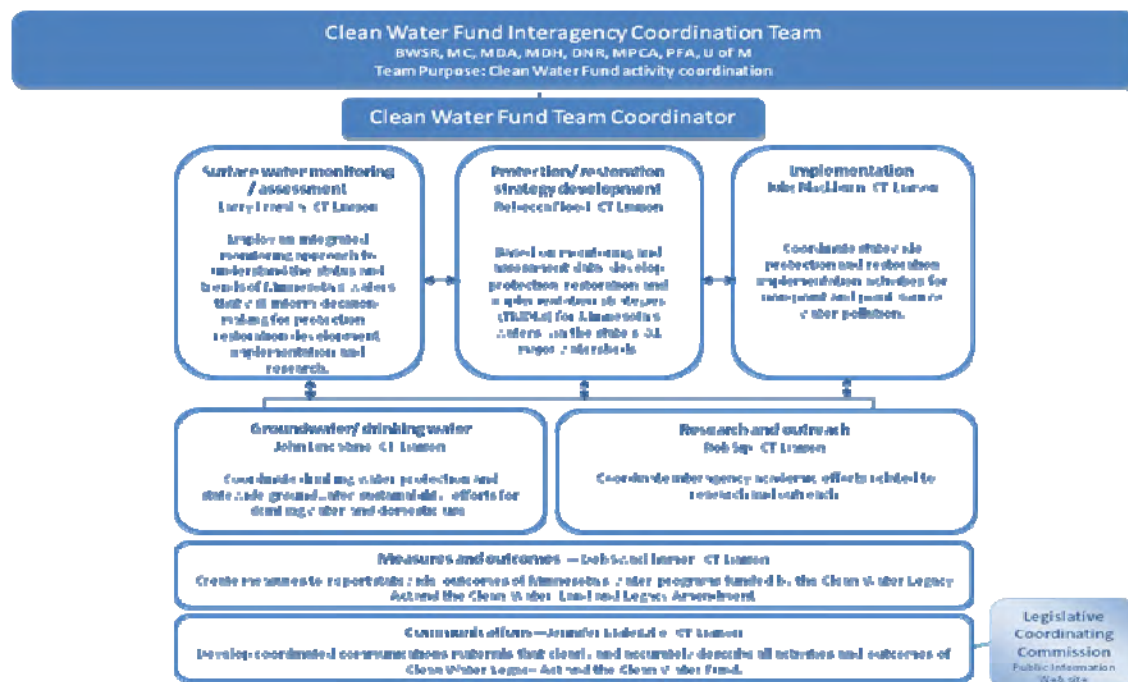
Additionally, the Coordination Team established the following interagency sub-teams (see **Figure 1**) to achieve sustainable management and protection of the State's surface water and groundwater resources:

- Surface water monitoring/assessment
- Protection/restoration strategy development
- Implementation
- Research
- Groundwater/drinking water
- Measures/outcomes
- Communications

An overall system expectation was established for each sub-team that they will be integrally linked to achieve the overall broad goal of protecting the State's public health, economic health and ecosystem health.

Protecting and restoring Minnesota's waters is a priority for all of the agencies that received a part of the Clean Water Fund. Despite unique agency missions, partnership and coordination around water quality management activities has been occurring for years. With the passage of the Amendment, this coordination has been further institutionalized into a system. Because the Clean Water Fund will exist for 25 years, agencies will employ adaptive management strategies throughout the life of the funding to ensure the best environmental outcomes are achieved.

Figure 1. Clean Water Fund Interagency Coordination Team, with sub-teams.



Moving to a watershed approach²

The MPCA established a goal to assess the condition of Minnesota's waters via a 10- year cycle, followed by development of protection and restoration strategies and implementation efforts. The key approach used in this strategy is that of the "major," or eight digit hydrologic unit code (HUC), watershed. There are 81 major watersheds in Minnesota. The MPCA and its partners began implementing this approach in 2007, following a pilot monitoring study conducted in the Snake River Watershed in 2006.

The watershed approach intensively monitors streams and lakes within a major watershed to determine the overall health of the water, identify impaired waters, and identify waters in need of additional protection efforts to prevent impairments. Follow-up monitoring is then done in impaired sub-watersheds to determine the cause(s) of the impairments (the "stressors" impacting the biological community) and to identify pollutant sources. Lastly, a restoration (TMDL) or protection strategy and implementation plan is written for the watershed so that partners can begin best management practice improvements.

Benefits of the watershed approach

The intensive nature of this monitoring (i.e., the good coverage of sites within the watershed) leads to one of the significant benefits of the approach – the identification of most, if not all, of the impairment problems and protection needs at one time. This allows for an opportunity to address needs in a watershed through a coordinated strategy development process. This is much different than past monitoring, when limited monitoring resources were not concentrated in defined areas. As a result, MPCA often identified some impairments in an area during one year, and additional impairments at the same site in later years, necessitating a separate TMDL study or slowing the progress of the one underway. The watershed approach will prevent this from occurring through more comprehensive monitoring and assessment, enabling the development of watershed-wide studies addressing both protection and restoration needs.

² **CPP Element 2:** A process for incorporating elements of any applicable area-wide waste treatment plans under section 208, and applicable basin plans under section 209 of the CWA.

The major watershed approach also provides predictability in the monitoring schedule. By establishing a schedule for monitoring all the state's major watersheds every 10 years, the State can accomplish the following:

- Provide advance notice to interested stakeholders, local governments and volunteers regarding monitoring plans.
- Assist local groups in ramping up their monitoring efforts to provide data in advance or in between agency monitoring efforts.
- Provide stakeholders a heads up as to when they can expect the TMDL study and protection strategy work to begin in their area.
- Ensure that comprehensive information on the status of water quality – and water quality management efforts – is collected, evaluated and provided to state and local partners at least once each decade.

These advantages simplify planning for all aspects in the implementation of the Federal Clean Water Act.

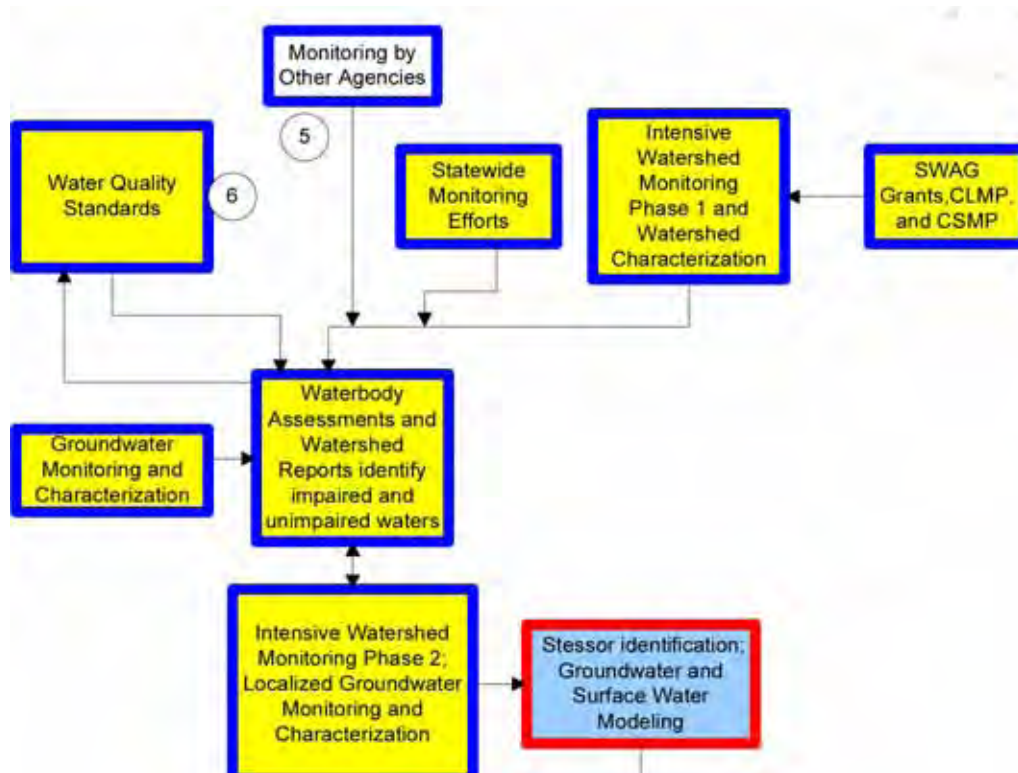
Adaptive management of the watershed approach

As the MPCA conducts its water program, it will use the watershed approach as an organizing principle, though there may be times when water management activities are better addressed at the basin, minor watershed or waterbody/segment levels.

Throughout this document, each section will illustrate how the watershed approach is being implemented and describe new or future activities that the MPCA plans to or is currently undertaking.

Because unique water management needs exist and change over time, the agency will use adaptive management principles to recognize the best approach to addressing these different water issues. Adaptive management entails a plan-do-check cycle whereby after implementation has proceeded for a time, re-assessment is performed and adaptations are made in the successive cycle to optimize actions and results. In the TMDL context, the agency will use adaptive management as part of its implementation process. Adaptive management will be used to ensure that implementation activities are focused on achieving the reductions necessary to achieve compliance with TMDL requirements as efficiently as possible. The MPCA believes that a flexible and focused approach to implementing TMDLs will ensure that impaired waters are restored as efficiently as possible.

Water Quality Standards, Monitoring and Assessment



Water quality standards (WQSs) are fundamental tools that help protect Minnesota's abundant and valuable water resources from pollution. After water quality condition monitoring is completed, the MPCA conducts a rigorous assessment process to determine if water bodies meet the water quality standards that protect beneficial uses.

Monitoring suggests that about 40 percent of Minnesota's lakes and streams are impaired for conventional pollutants, a rate comparable to what other states are finding. Impaired waters identified through the assessment process are placed on the MPCA's 303(d) Total Maximum Daily Load (TMDL) List.

Water quality standards

Beginning with Minnesota's first statewide water quality rule in 1967 and enhanced by requirements of the 1972 Federal Water Pollution Control Act (Clean Water Act, and subsequent amendments to the Act, water quality standards are the basis for protecting surface water and groundwater quality.

Foundation for water quality protection

Water Quality Standards (WQSs) consist of three elements (Minn. R. chs. 7050 and 7052):

1. Classifying waters with designated beneficial uses.
2. Narrative and numeric standards to protect those uses.
3. Nondegradation (antidegradation) policies to maintain and protect existing uses and high quality waters.

The term “water quality standards” is commonly used in both a broad and narrow sense. Broadly speaking, WQSs include all the three elements and legal requirements in water quality rules described above, including minimum wastewater treatment requirements and effluent limits for point source dischargers. In the more narrow sense, pollutant-specific numeric and narrative criteria when associated with a beneficial use classification are referred to as “standards”; both numeric and narrative criteria define acceptable conditions for the protection of the uses designated in waters of the state (Minn. Stat. ch. 115)³.

Designated beneficial use classifications

Waters of the state are classified under a multiple-use classification system. Once a waterbody has been classified, a specific set of standards apply to protect those uses. Minnesota's WQS rules contain the following use classifications:

- **Class 1 waters – domestic consumption:** Define protection for potable water use, including as a source to supply drinking and culinary or food processing use. All groundwater and specifically designated surface waters are Class 1 waters.
- **Class 2 waters – aquatic life and recreation:** Centered on protection of healthy communities of aquatic plants and animals and their habitats, aquatic recreation, and fish consumption. Class 2 waters are further divided into four subclasses based on aquatic life and waterbody characteristics and drinking water use designations.
- **Class 3 waters – industrial consumption:** Classifies waters for industrial uses, except food processing.
- **Class 4 waters – agriculture and wildlife:** Provide for irrigation and use by livestock and wildlife for watering.
- **Class 5 waters – aesthetic enjoyment and navigation**
- **Class 6 waters – other uses**
- **Class 7 waters – limited resource value waters**

Minnesota Rule 7050.0470 is a listing, by major watershed, of individual waters and their associated use classifications. Only a limited subset of all waters is listed in Minn. R. 7050.0470. For example, waters that are individually listed include trout waters, surface waters protected for drinking, outstanding resource value waters, and limited resource value waters. All waters not listed in Minn. R. 7050.0470 are assigned multiple beneficial uses by “default,” including aquatic life and recreation, under Minn. R. 7050.0425 and 7050.0430 (Class 2, and Classes 3, 4A, 4B, 5 and 6).

³ Minn. Stat. § 115.01, subd. 22 defines “waters of the state” as all streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, reservoirs, aquifers, irrigation systems, drainage systems and all other bodies or accumulations of water, surface or underground, natural or artificial, public or private, which are contained within, flow through, or border upon the state or any portion thereof.

Minnesota's water quality rules chapters 7050 and 7052, including links to specific parts or subparts of the rules, can be accessed through the Minnesota's Office of the Revisor of Statutes webpage at www.revisor.mn.gov/rules/?agency=167.

Numeric and narrative standards

A narrative WQS is a statement that prohibits unacceptable conditions in or upon the water, such as floating solids, scums, visible oil film, or nuisance algae blooms. Narrative standards are sometimes called “free froms” because they help keep surface waters *free from* visible and basic types of water pollution. Narrative standards set the protection level goals and include general definitions to specific methods to derive numeric standards (e.g., site-specific criteria for toxic pollutants). Most narrative standards are directed at providing protection for the aquatic life, recreation, fish consumption, or aesthetic beneficial uses.

Numeric WQSs represent safe concentrations in water that protect a specific beneficial use. Minn. R. ch. 7050, *Waters of the State*, lists numeric standards for groundwater and many of the surface water uses, particularly Class 2. Minn. R. ch. 7052 implements the Great Lakes Initiative in the Lake Superior Basin and has numeric standards primarily for bioaccumulative toxic pollutants for the protection of aquatic life, human health, and fish-eating wildlife. Minn. R. ch. 7052 also incorporates other WQSs from Minn. R. ch. 7050 by reference. As surface waters are protected for multiple uses, some pollutants have more than one applicable standard; in such cases the most restrictive WQS applies.

Class 2 WQSs play the largest role in surface water protection as they implement the main State and Clean Water Act (CWA) goals⁴ as stated in 7050.0140, subp. 3:

Class 2 waters, aquatic life and recreation: Aquatic life and recreation includes all waters of the state that support or may support fish, other aquatic life, bathing, boating, or other recreational purposes and for which quality control is or may be necessary to protect aquatic or terrestrial life or their habitats or the public health, safety, or welfare.

These goals are implemented in narrative standards for protection of human health and biological community integrity from pollutants and nuisance conditions. Numeric standards are developed from the narrative goals by MPCA to address acute (short-term) and chronic (long-term) effects to aquatic life from conventional (e.g., dissolved oxygen and phosphorus) and toxic pollutants. Biological and chemical monitoring examines if these WQSs are being met. Human health protection is incorporated in chronic standards and applied using primarily pollutant-specific water concentrations. More recently direct application of WQSs in fish tissue was included for mercury; other bioaccumulative toxics are assessed based on Minnesota Department of Health's Fish Consumption Advice (on-line at www.health.state.mn.us/divs/eh/fish/index.html).

Nondegradation provisions

The third element of WQSs in addition to beneficial uses and numeric or narrative standards is nondegradation (equivalent to the federal term “antidegradation”). Federal regulations establish three levels or tiers of protection used by states for nondegradation compliance and review.

Minnesota Rule 7050.0185 provides for the maintenance and protection of existing uses (Tier 1 protection) and high water quality (Tier 2 protection). Existing uses are defined in 40 CFR § 131.3(e) as those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the WQSs. Existing uses may not be removed. High water quality is that quality better than the criterion of the applicable standard, on a parameter by parameter basis. The lowering of high water quality is not allowed unless it is necessary for important social or economic development in the area in which the waters are located. Public participation and intergovernmental cooperation must be included in the decision to lower high water quality.

⁴ CWA goals: 1) wherever attainable, achieve a level of water quality that provides for the protection and propagation of fish, shellfish, and wildlife, and for recreation in and on the water, and take into consideration the use and value of public water supplies, and agricultural, industrial, and other purposes, including navigation (sections 101(a)(2) and 303(c) of the Act); 2) and restore and maintain the chemical, physical, and biological integrity of the Nation's waters (section 101(a)).

Minnesota waters of exceptional value, designated as Outstanding Resource Value Waters (ORVWs), are protected through Minn. R. 7050.0180. They are classified as such for their special characteristics such as high water quality, or as having exceptional recreational, cultural, aesthetic or scientific value. There are three categories of ORVWs; Prohibited, Restricted and Unlisted. Waters in the Prohibited category are the most pristine or sensitive ORVWs and are analogous to the federal Outstanding National Resource Waters or ONRWs (Tier 3 protection). By current state rule new or expanded discharges are prohibited to these waters. New or expanded discharges to Restricted ORVWs are not allowed unless an applicant can demonstrate there is not a prudent or feasible alternative to the discharge. New or expanded discharges to Unlisted ORVWs are prohibited or stringently controlled to preserve the existing high quality or the special characteristics that make the water an ORVW. The intent of this section is to allow for flexibility to include waters that are at a later time determined to possess the characteristics of an ORVW.

How water quality standards are used

Numeric and narrative WQSs have a variety of functions; they are used to:

1. Define maximum allowable levels of pollutants to protect beneficial uses.
2. Ascertain the quality of the state's water resources by comparing the standards to monitoring data.
3. Identify waters that do not meet WQSs as part of the Integrated Water Quality Assessment and CWA 303(d) Impaired Waters list process.
4. Help establish priorities for the allocation of treatment resources and cleanup efforts.
5. Set effluent limits and treatment requirements for dischargers.
6. Assess risks to surface water from groundwater contamination sites and help define remediation goals.

More details on Water Quality Standards (WQSs) are available at the MPCA's website at www.pca.state.mn.us/index.php/water/water-monitoring-and-reporting/water-quality-and-pollutants/water-quality-standards.html.

Water quality standard review and revision process⁵

Minnesota's WQSs must meet or be more stringent than federal requirements. Provisions in the Clean Water Act (CWA) require states to review and revise their WQSs at least once every three years and adopt standards that meet minimum national requirements and *reflect the latest* science, including addressing additional pollutants that may threaten beneficial uses. For some pollutants, the EPA publishes numeric criteria for states to use to adopt WQSs that protect aquatic life and human health. The MPCA can modify the criteria based on local data or develop their own. The EPA has final approval of all WQS revisions.

The MPCA completed the most recent Triennial Water Quality Rules Revisions (www.pca.state.mn.us/water/standards/rulechange08.html) in 2008 and has scoped and initiated technical work for the 2011 (www.pca.state.mn.us/water/standards/rulechange.html) revision cycle. As described further in the next section, many of the recent and planned revisions stemmed from or were enhanced by Minnesota-specific monitoring data.

Current and future improvement activities and integration with the watershed approach

Recent statewide and legislative priorities have recognized the importance of Minnesota's water resources and the challenges facing them. These activities have meant an expansion of MPCA's water monitoring programs. Of particular relevance to WQSs is the implementation of the Intensive Watershed Monitoring (IWM) strategy.

⁵ **CPP Element 6:** A process for establishing and assuring adequate implementation of new or revised water quality standards, including schedules of compliance, under Section 303(c) of the CWA.

- As previously discussed, WQSs provide the goals for water quality against which MPCA can assess the quality of the state's waters and the success of ongoing pollution-prevention programs. As such, WQSs serve as the basis for determining the list of impaired waters required under Section 303(d) of the CWA; also approved by EPA.
- The goal of IWM is to obtain more robust, comprehensive data to better meet this requirement of determining if WQSs are being met and to generally document water quality conditions.
- For this reason, the WQS unit is working closely with the Water Monitoring Section on the redesign of the surface water assessment process and on the monitoring design (e.g., pollutants and frequency of monitoring).

Surface water monitoring data collected by the MPCA and its partners as part of the IWM design is also used as the foundation for new and revised WQSs. This helps the MPCA meet a key goal of WQSs: to use regional and local data rather than EPA national defaults.

- Recently adopted eutrophication standards for lakes and reservoirs were based on years of MPCA and citizen monitoring data. The parameters covered included phosphorus and chlorophyll-a concentrations, Secchi disc readings, and water user surveys.
- Chemical and aquatic biological data (fish and invertebrates) collected in Minnesota streams are providing the basis for new eutrophication standards by ecoregion for rivers as part of the next Triennial Water Quality Rules Revisions (2008-2011).
- Revised turbidity standards are also being developed based on Minnesota monitoring results and recognition of ecoregions and other underlying factors affecting turbidity in surface water.
- As part of improving assessment of water quality standards, an MPCA work group produced a new natural background guidance document that builds on the availability of more comprehensive localized monitoring data (www.pca.state.mn.us/index.php/view-document.html?gid=8603).
- On a site-specific basis, WQSs can be modified, which has been the case for some TMDLs; however, this process can be resource intensive and requires EPA approval.
- Information on pollutant stressors gained from the IWM could help prioritize future WQSs.

The IWM aquatic biology monitoring, supported by habitat reviews, is leading to future development of refined aquatic life use classifications on a watershed or individual river scale; this reclassification called Tiered Aquatic Life Uses (TALU) has been recommended by EPA to improve application of WQSs. TALU will more holistically address aquatic life protection on an appropriate scale (e.g., watershed) and in a manner consistent with the causes of impairments to better direct remedial efforts where meeting WQSs is a priority and achievable. TALU will also more accurately measure future degradation or improvements in aquatic communities. More discussion is available at the MPCA TALU webpage (www.pca.state.mn.us/index.php/water/water-monitoring-and-reporting/water-quality-and-pollutants/the-tiered-aquatic-life-use-talu-framework.html?menuid=&missing=0&redirect=1).

The WQSs unit is revising rules governing nondegradation (www.pca.state.mn.us/index.php/water/water-permits-and-rules/water-rulemaking/nondegradation-rulemaking.html?menuid=&missing=0&redirect=1). The last major changes to Minnesota's nondegradation policy and implementation procedures occurred in 1988. Since that time there have been many changes to the state and federal regulatory structure of water protection and the technical understanding of water quality protection. The rule revision will include the following:

- Broadening the scope of implementation to include other regulated activities such as National Pollutant Discharge Elimination System (NPDES) permitted stormwater discharges.
- Revised thresholds (triggers) used to require Tier 2 review (i.e. removal of a flow-based *de minimis* level).
- Revised procedures for public participation and intergovernmental cooperation.
- Implementation of nondegradation through the issuance of general permits; and greater emphasis on alternatives analysis.

Internal and external partners and stakeholders

The Water Quality Standards Unit in the Environmental Analysis and Outcomes Division is the lead for WQSs and rules (Minn. R. chs. 7050 and 7052). This unit works in cooperation with the Effluent Limit Unit and Regional Division on other activities that require EPA approval from developing site-specific modified WQS to TMDL approvals. WQSs unit also works closely with the Municipal and Industrial Divisions and Remediation Division.

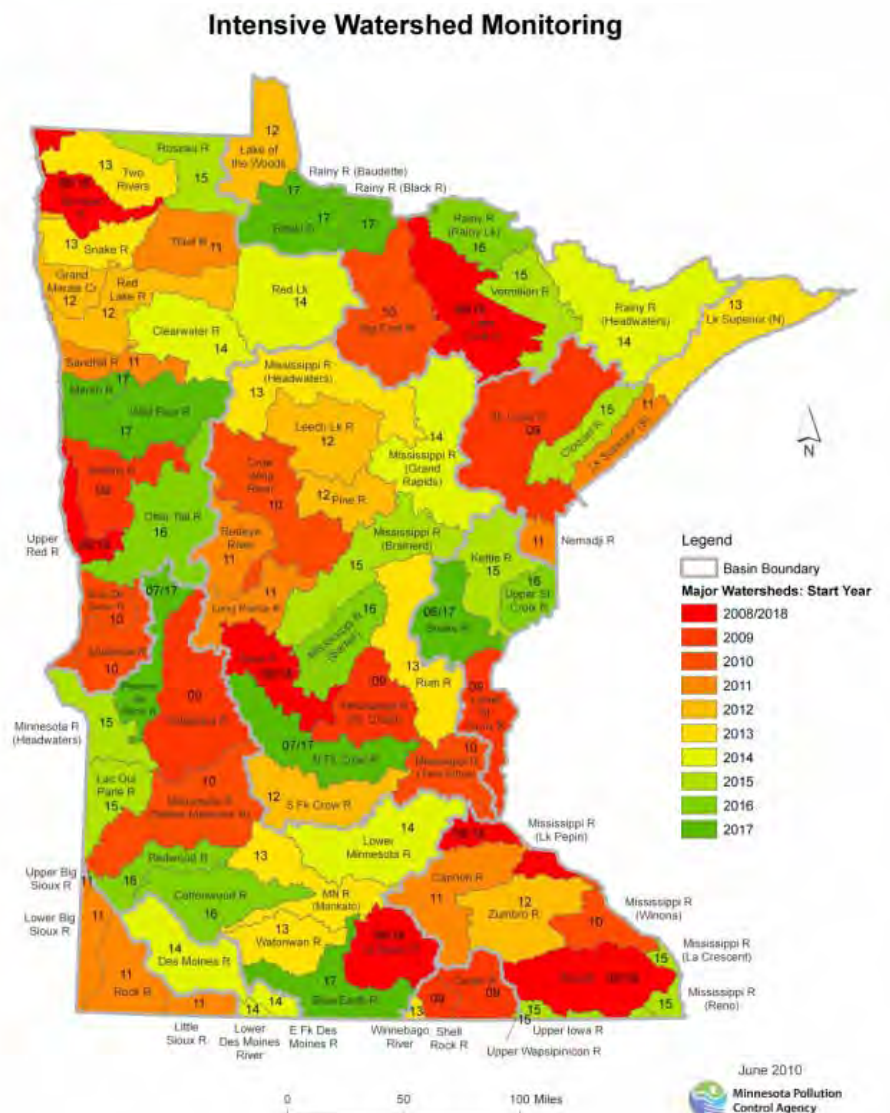
The MPCA receives support for human health risk assessment from the Minnesota Department of Health, and regularly discusses and supports work on pesticide issues with the Minnesota Department of Agriculture. The Minnesota Department of Natural Resources and Metropolitan Council are also contributing to a new project examining groundwater and drinking water rules administered by MPCA. The WQS Unit as lead for Triennial Revisions also communicates regularly with environmental advocacy groups and Minnesota citizens. Recent nondegradation rulemaking efforts have included extensive public and stakeholder participation.

Statewide monitoring activities

The Minnesota Pollution Control Agency (MPCA) conducts a variety of surface water and groundwater condition monitoring activities focused on providing critical information to assess the condition of Minnesota's water resources. This information also is used to assess potential and actual threats to water quality and to evaluate the effectiveness of management activities taken to address impairments and other threats to water quality. Monitoring conducted by other local, state, and federal agencies, citizen monitoring as well as remote sensing data are also used for this purpose.

The MPCA's primary condition monitoring activities are organized around Minnesota's "major" watersheds, of which there are 81. The MPCA has established a schedule for intensively monitoring each major watershed once every ten years, and the watershed outlets every year. An outcome of this monitoring is the identification of waters that are impaired (i.e., do not meet standards) and need restoration and waters in need of further protection to prevent impairment. In addition, the MPCA conducts probabilistic (random) surveys of Minnesota lakes, streams and wetlands to determine water quality condition and trends over time on a statewide, ecoregion or basin scale. These studies allow the MPCA and others to gather in-depth information on sites that are representative of the state, ecoregion or basin as a whole. Targeted monitoring is also employed to collect information about specific water resources.

Figure 2: Intensive Watershed Monitoring



Watershed condition monitoring

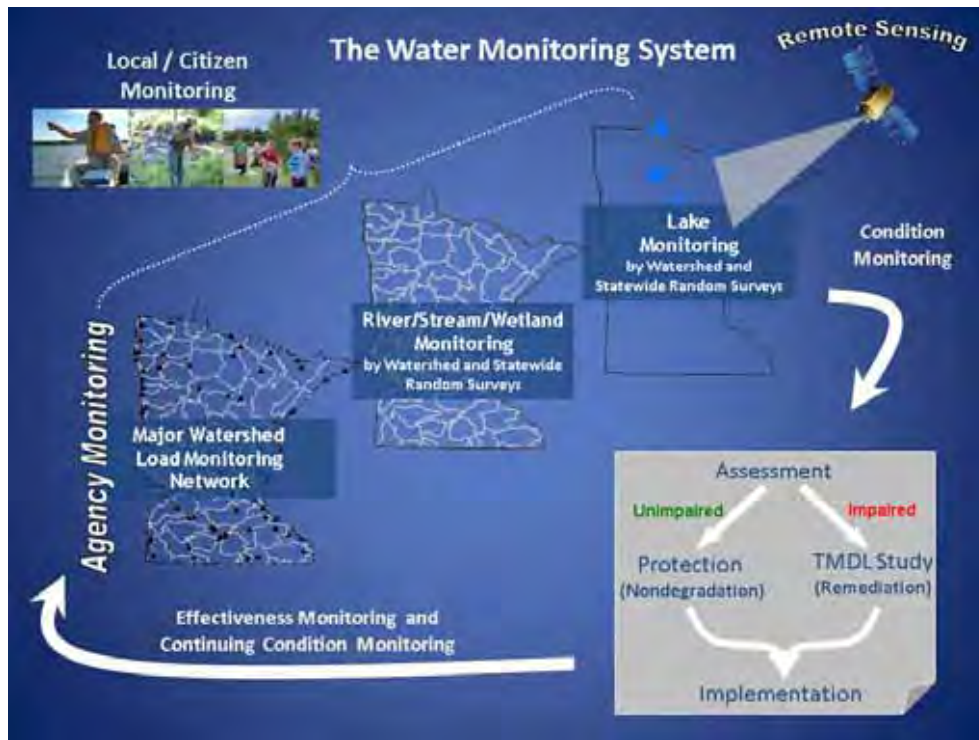
Water quality monitoring is the starting point in implementing the CWA-mandated process of assessing water quality, planning for water quality protection or restoration, implementation of protective or corrective measures, and follow-up effectiveness monitoring. Water quality monitoring results are used to determine whether a water body meets standards and whether water is impaired or unimpaired.

In 2006, the MPCA began organizing its statewide condition monitoring program around Minnesota's 81 major watersheds (i.e. 8-digit Hydrologic Unit Code or HUC level watershed), monitoring the condition of its rivers, streams and lakes on a watershed by watershed basis. Using this watershed approach, the MPCA conducts monitoring in 8 to 12 major watersheds each year, and will complete statewide monitoring over a ten-year period. The current ten-year schedule for watershed monitoring is located here:

www.pca.state.mn.us/index.php/water/water-monitoring-and-reporting/water-quality-and-pollutants/water-quality-condition-monitoring/water-quality-condition-monitoring.html. In addition, the MPCA conducts year-round contaminant load monitoring (integrating stream flow and analysis of stream chemistry from grab samples) at the outlets of all 81 major watersheds (8-digit HUCs).

A description of each monitoring component involved in the watershed approach, including the MPCA's efforts to incorporate wetland and groundwater monitoring activities, is provided below. The relationships between the monitoring components and how they inform watershed planning (including watershed protection and restoration plan development) and implementation activities are depicted in **Figure 3**.

Figure 3: Components of the MPCA's watershed-based monitoring approach



Monitoring rivers and streams of watersheds

A key feature of the MPCA's watershed approach is the intensive watershed monitoring (IWM) design for rivers and streams within the major watersheds. The IWM design incorporates sampling locations selected from the subwatershed (12-digit Hydrologic Unit Code or HUC) and "minor" (14-digit HUC) watersheds contained within the major (8-digit HUC) watershed, as well as at the major, subwatershed and minor watershed outlets (**Figure 4**). Combining information from the intermediate and minor watersheds within the major watershed provides a robust assessment of water quality without monitoring every single stream reach. The IWM approach improves the quality of the information about the water quality within a watershed, and also results in efficiency gains.

Figure 4: Intensive watershed monitoring design, Snake River Watershed



Two years of monitoring are conducted to provide the data needed for assessment purposes (referred to as Phase I monitoring.) Both stream chemistry and stream biological monitoring are conducted. In addition, fish tissue sampling is conducted at the watershed outlet to evaluate fish for human consumption concerns (aquatic consumption use).

Biological monitoring is an important component of the MPCA's monitoring approach. It is an effective tool for assessing water resource quality, regardless of whether the stressor impacting the stream reach is chemical, physical, or biological in nature. The biological community represented by biological samples (the number and variety of species present) provides an indication of overall stream health when compared to the index of biological integrity (IBI) appropriate for the particular stream. Biological monitoring is often able to detect water quality impairments that other monitoring methods may miss or underestimate. For more information about the MPCA's biological monitoring program, visit www.pca.state.mn.us/index.php/water/water-monitoring-and-reporting/biological-monitoring/biological-monitoring-of-water-in-minnesota.html.

In each major watershed, the monitoring schedule is as follows:

Year 1: Stream chemistry sampling is conducted; stream fish and invertebrate monitoring is conducted, including fish collection for tissue sampling

Year 2: Follow-up stream chemistry sampling is conducted as needed; invertebrate samples are identified by a contract laboratory

Note that biological sampling stations on occasion are different from the intensive water chemistry sampling locations, since they are selected on the basis of fish habitat and other criteria.

Watershed outlet load monitoring

Watershed load monitoring involves defining the amount of a parameter (e.g., phosphorus, nitrate, chloride) passing through a monitoring point in the watershed per unit time. Contaminant loads are calculated by integrating stream flow gauging data and stream chemistry data. Determination of loads at the watershed outlet makes it possible to compare watersheds to each other and in relation to the watershed characteristics.

Watershed loads can also be used to assess trends in the water quality of a specific watershed over time, and to see how data from a given year compare to the long term record for a watershed. This information is particularly helpful in putting the IWM data into a longer term context, given that intensive monitoring occurs in each watershed once every ten years. It is also critical for developing and monitoring the effectiveness of watershed restoration and protection plans at the broad watershed scale.

To obtain watershed load information, the MPCA has developed a major watershed load monitoring network that involves permanent flow and chemistry monitoring stations at the outlets of the state's 81 major (8-digit HUC) watersheds. The network is a partnership effort between the MPCA and the DNR, along with the U.S. Geological Survey and the Metropolitan Council. The load network provides the cornerstone to the watershed approach in that it involves continuous flow and water quality data collection, which enables computation of annual load for each watershed, each year. The major watershed load monitoring network operates year round and from year to year.

Watershed load monitoring stations are located at all of Minnesota's major watersheds except those draining landscapes contained primarily in neighboring states. Load monitoring sites are also located at various locations along Minnesota's major rivers including the Red, Minnesota, Mississippi, and Rainy (**Figure 5**). On average, the major watersheds have a drainage area of about 1400 square miles.

In addition to the primary watershed load monitoring conducted at the major watershed outlets, the MPCA is developing guidelines for selecting and operating temporary load monitoring stations at subwatershed (12-digit HUC level) watershed outlets located within the major watersheds. Subwatershed load monitoring stations are desirable to refine follow-on watershed studies, by providing finer scale data to calibrate numerical watershed flow models, to inform "stressor identification" efforts and to better define areas of concern. The MPCA anticipates that from three to eight subwatershed load monitoring stations may be sited within each major watershed. The actual number of stations will be based upon individual major watershed characteristics and conditions. Current plans assume the subwatershed load monitoring stations will be deployed for a period of three years, aligning with the IWM monitoring and ten year rotation. After the three years, the subwatershed load monitoring stations would in most cases be moved to other major watersheds that are just beginning the IWM monitoring. Plans for subwatershed load monitoring are preliminary at this time.

Lakes

Lake monitoring poses challenges that are different from rivers and streams. Minnesota has about 12,200 lakes greater than ten acres in size. Of those, about 2,300 are between 100 and 500 acres, and about 700 are 500 acres or larger. Since it would be prohibitively expensive to monitor all of Minnesota's lakes – just like it would be to sample every stream reach – the MPCA has developed a lakes sampling strategy.

Figure 5: Major watershed load monitoring sites



The MPCA's goal is to sample all lakes 500 acres or larger and at least 50 percent of lakes 100 to 500 acres in size over the ten-year IWM schedule. This translates to sampling about 100 lakes each year. As of 2010, MPCA lake monitoring has been synchronized with the IWM schedule.

The MPCA also monitors some smaller lakes, but typically only when the lakes can easily be worked into the monitoring schedule. The MPCA primarily relies on local partners funded through Surface Water Assessment Grants (SWAG) to sample lakes smaller than 100 acres in size, as well as additional lakes in the 100 to 500 acre size range.

The MPCA conducts two years of lake chemistry monitoring. Lakes are sampled on a monthly basis from May to September to obtain sufficient data for assessments. The MPCA also collects data on the lake physical parameters.

To obtain a snapshot of water quality in lakes that are not sampled and supplement the chemical and physical monitoring that is conducted on sampled lakes, the MPCA uses satellite remote sensing information and other indicators of lake water quality.

At the present time, the MPCA does not conduct biological monitoring in lakes. However, MPCA is collaborating with the Minnesota Department of Natural Resources (DNR) to develop lake IBIs for fish and plants. It is anticipated that development of lake IBIs will be completed in the next three to five years. For more information about monitoring of lakes, see www.pca.state.mn.us/index.php/water/water-types-and-programs/surface-water/lakes/lakes-and-lake-monitoring-in-minnesota.html.

Wetlands

At this time, the MPCA's wetland monitoring activities are not incorporated into the watershed approach. Integration of wetlands into the watershed approach is proceeding at a slow pace, in part because regulation of wetlands is complex and funding for wetland monitoring is much more limited than for lakes and streams.

How wetland monitoring will be incorporated into the watershed approach is still under development. However, it is clear that improving the quality and the quantity of wetlands within Minnesota's major watersheds will contribute to improvement of overall water quality within the watershed.

Local partner and volunteer citizen monitoring

Local partner and volunteer citizen monitoring are important components of the watershed approach. While the MPCA focuses its monitoring efforts on the major watersheds in their rotation through the ten-year schedule, the monitoring conducted by local partners and volunteer citizens provides additional data needed to complete assessments and evaluate the status and trends of water bodies in the years between the ten-year cycle.

Local partners have access to funding through the MPCA's Surface Water Assessment Grant program. The SWAG program is competitive; it is designed to provide funding to projects that will result in the collection of water quality data of the proper type, adequate frequency, and quality to determine the chemical, physical, and biological integrity of Minnesota lakes and streams, to identify if designated uses are being met.

Surface Water Assessment Grants

First funded in 2006 by the Minnesota Legislature, Surface Water Assessment Grants (SWAG) were designated to provide local organizations and citizen volunteers with funds to complete the monitoring needed to meet assessment requirements on Minnesota lakes and streams. The Minnesota Pollution Control Agency (MPCA) is the agency responsible for administering the grant program.

Since then, the following accomplishments have been made:

2007 – 12 grants, totaling \$1.01 million, were given out for monitoring at 84 lake sites and 98 stream sites. Projects had a volunteer rate of 92 percent

2008 – 41 grants, totaling just under \$2 million, were given out for monitoring at 467 lake sites and 325 stream sites. Projects had a volunteer rate of 90 percent.

2009 – 33 grants, totaling \$1.73 million, were given out for monitoring at 244 lake sites and 408 stream sites. Projects had a volunteer rate of 91 percent.

2010: 28 grants, totaling \$1.1 million, were given out for monitoring approximately 196 lake sites and 150 stream sites. Projects had a volunteer rate of 89 percent.

Information about the SWAG program is available at www.pca.state.mn.us/index.php/water/water-types-and-programs/surface-water/surface-water-assessment-grants.html

The SWAG program is also important because it engages local partners in the condition monitoring process. Long term and early engagement by local stakeholders in monitoring and assessing water resources is an important element in the successful implementation of watershed restoration and protection strategies.

The MPCA coordinates two statewide volunteer citizen monitoring programs: the Citizen Lake Monitoring Program (CLMP) and the Citizen Stream Monitoring Program (CSMP).

The CLMP was started in 1973 and is one of the nation's largest and longest running volunteer lake monitoring programs. Volunteers use Secchi disks to monitor lake clarity weekly at more than 2,200 sites throughout the open water months. CLMP Secchi disk data are used to support the lake assessment process, as well as to calculate water clarity trends on lakes where sufficient data have been collected. An advanced CLMP program (CLMP+) is available for lakes that lack assessment-level water quality data. CLMP+ trains volunteers to collect a suite of water quality parameters including temperature, dissolved oxygen, phosphorus and chlorophyll-a. CLMP+ data contribute directly to the assessment process.

The CSMP began in 1998. Volunteers monitor the clarity of their local streams and rivers weekly using a transparency tube. Data are recorded from April through October. Volunteers' also record daily rainfall amounts at their homes. CSMP-collected transparency tube data are used in the stream assessment process as well as in stream transparency trend analysis. More information about the MPCA's citizen volunteer monitoring programs is available at www.pca.state.mn.us/cmp.

The MPCA's move to the watershed approach has provided the citizen volunteer monitoring programs and the SWAG program with additional focus. For example, the MPCA prepares volunteer recruitment lists for lakes and streams for which condition data are desired to supplement Agency assessment monitoring; the goal is to retain the recruited volunteers to continue monitoring in the years between MPCA monitoring visits. In administering the SWAG program, the MPCA has revised the SWAG application materials to include priority and grant ranking criteria so that local stakeholder proposals for watersheds in which monitoring data are most needed receive higher scoring.

Monitoring and the watershed approach: looking to the future

Over time, the monitoring data collected via the ten year rotating cycle from the major watersheds and annually from the watershed outlets can be used to identify trends in water quality. Trend data help determine whether water quality conditions are improving or worsening, and also provides information to assess the effectiveness of management actions in improving the state's waters overall.

Targeted and probabilistic monitoring activities

In addition to the condition monitoring described above, the MPCA carries out several additional monitoring projects that provide additional information about the condition of the state's water resources. These other monitoring activities are set up for very specific purposes; however, they also contribute data that are captured in the assessment process.

The Minnesota Milestone Program

The Minnesota Milestone Program began in 1953 with the goal of developing long-term water quality data from a set of designated stream sites located across the state. When the Minnesota Pollution Control Agency (MPCA) was created in 1967, it was given responsibility for the Milestone Program. The Milestone program has been in continuous operation since this time, and the data provided by the program make it possible to develop an understanding of the overall health and long-term water quality trends of Minnesota's rivers.

The Milestone Program has evolved over time; the sampling plan and sites that are currently monitored were selected in 1994.

With the conclusion of the 2010 field monitoring season, the Milestone Program has been discontinued in favor of the new load monitoring approach. More information about the Milestone Program and the trends that have been identified using this long term data are available at www.pca.state.mn.us/index.php/water/water-types-and-programs/surface-water/streams-and-rivers/minnesota-milestone-river-monitoring-program.html?menuid=&missing=0&redirect=1.

Sentinel Lakes Monitoring Program

The Sentinel Lakes Program is part of a long-term, collaborative monitoring effort that is being led by the Minnesota Department of Natural Resources (DNR). The overall program, referred to as, “SLICE – Sustaining Lakes in a Changing Environment,” is designed to provide data that will help with understanding and predicting the consequences of land use and climate change on lake habitats.

The Sentinel Lakes monitoring program is Phase 1 of SLICE, and is slated to run from 2008 to 2012. The SLICE program will involve long-term monitoring of water chemistry, fisheries, habitat and other factors in these lakes as well as detailed assessment of watershed and related characteristics. The MPCA is a partner in this effort, and is primarily focused on collection and assessment of water quality data for these lakes. For more information, visit: www.dnr.state.mn.us/fisheries/slice/sentinel.html.

Ambient trace metal stream sampling

The MPCA conducted ambient trace metal sampling in Minnesota’s nine major river basins beginning in 1995 and ending in April 2009. Approximately ten sites were selected in each major river basin and sampled four to five times during a three-year period for trace level concentrations of metals (in the Lower Mississippi Basin, four samples were collected from each site during a one-year period). The purpose of the program was to evaluate the presence and extent of trace concentrations of metals at sites within and between river basins, and to assess the need for water quality standards or other policy changes to address the findings.

The results indicate that any future monitoring of streams for metals should focus on standard-level (not trace) concentrations. Further monitoring of metals at the trace level was deemed unnecessary and MPCA has discontinued this activity.

Minnesota comprehensive wetland assessment monitoring and mapping strategy

Wetlands in Minnesota are regulated by both federal and state statutes, by several state agencies (MPCA, DNR and Board of Water and Soil Resources) as well as local units of government. An interagency workgroup that included federal agency partners developed a comprehensive strategy for assessing wetlands in Minnesota in 2006. As part of this strategy, the MPCA is carrying out a multi-year, statewide, survey of wetland quality. For more information, see the Minnesota Comprehensive Wetland Assessment Monitoring and Mapping Strategy, www.pca.state.mn.us/index.php/water/water-types-and-programs/surface-water/wetlands/minnesota-comprehensive-wetland-assessment-monitoring-and-mapping.html.

Probabilistic monitoring

Probabilistic (or random) surveys have become an important tool for monitoring the condition of Minnesota’s water resources. These surveys provide data sets that yield statistically sound, unbiased estimates of the condition of the state’s water bodies, and are very helpful in determining trends in water resource condition over time.

The MPCA, with the assistance and/or funding provided by EPA, has conducted probabilistic surveys of Minnesota streams since 1996. Since that time, EPA has expanded its National Aquatic Resource Surveys (NARS) program (<http://water.epa.gov/type/watersheds/monitoring/nationalsurveys.cfm>). This has provided the MPCA with the opportunity to expand its state-based probabilistic survey project from streams to lakes and, soon, to wetlands. These surveys are expected to provide a wealth of information to guide Minnesota’s water protection and restoration policies.

The EPA’s NARS now includes the National Rivers and Streams Assessment (NRSA), the National Lakes Assessment Project (NLAP) and the National Wetland Condition Assessment (NWCA). The EPA plans to conduct these surveys on a national basis every five years. Brief background on each of these national surveys is provided below.

The EPA’s NRSA was conducted in Minnesota in 2004, at which time it included two separate surveys: the wadeable and non-wadeable stream surveys. Although the next NRSA for Minnesota was scheduled to take place in 2009 (five years after the 2004 survey), the NRSA sampling is being conducted in 2010. For the 2010 iteration EPA has revised the NRSA so that the wadeable and non-wadeable streams surveys are combined into one survey referred to as the flowing waters survey. Sampling for the 2010 EPA flowing waters survey in Minnesota will include 48 sites. A final report summarizing the results of the national survey is scheduled to

be released in 2011. More information about the EPA's NRSA is available at the MPCA's website: www.pca.state.mn.us/index.php/water/water-monitoring-and-reporting/water-quality-and-pollutants/water-quality-condition-monitoring/random-survey-of-the-nation-s-rivers-and-streams.html

The EPA's National Lakes Assessment Project (NLAP) survey was conducted in Minnesota in 2007. A total of 41 Minnesota lakes were randomly selected by EPA to provide a statistically sound data set for the national survey. More information about the NLAP survey and results is available at www.pca.state.mn.us/index.php/water/water-types-and-programs/surface-water/lakes/lake-water-quality/national-lakes-assessment-project-nlap.html?menuid=&missing=0&redirect=1.

Planning is currently taking place for the EPA's National Wetland Condition Assessment (NWCA), which will be the first ever national survey on the condition of the Nation's wetlands. It is presently anticipated that sampling for the NWCA will take place in Minnesota in 2011.

Note that for each waterbody type, the EPA National Aquatic Resource Surveys design focuses on obtaining statistically significant national results; the data collected in Minnesota do not, on their own, provide a statistically valid data set for Minnesota. More information about Minnesota's own random surveys and their relationship to the national surveys is provided below.

Minnesota random rivers and streams survey

The MPCA began using random surveys to assess rivers and streams throughout Minnesota in 1996. The organizing framework for the random surveys was the major river basins, with surveys typically conducted within the same summer index period for each basin. Beginning in 2010, however, the MPCA is planning a different approach to the random river and stream survey; the survey will now focus on providing eco-region and statewide estimates of condition. With this approach, 150 randomly selected monitoring sites that span the entire state will be sampled within the same year. The 150 sites will be aggregated from 50 randomly selected sites within each of Minnesota's three ecoregions. It is planned that the survey sampling will be conducted every five years.

The random survey includes sampling for biological indicators and general water chemistry, as well as a number of other parameters at a subset of sites. In addition, in 2010, the MPCA sampled for pharmaceuticals and personal care products (PPCPs) and water column total organic carbon from all 150 sites, and for pesticides from 100 sites.

The revised design for the Minnesota random rivers and streams survey will provide more frequent estimates of condition, and show more clearly whether conditions are improving or degrading throughout the state (i.e., trend detection). The new survey will also present results separately for each of Minnesota's three major ecoregions in addition to providing statewide estimates of condition for a number of indicators.

Despite the transition to a statewide assessment approach, results from the earlier basin surveys can still be utilized as a baseline data set from which to compare future survey results. Since these sites were randomly selected, the results can be combined to provide statewide estimates of condition as well as repartitioned to provide estimates for each eco-region.

More detail about the survey design and past results are available at: www.pca.state.mn.us/index.php/water/water-monitoring-and-reporting/water-quality-and-pollutants/water-quality-condition-monitoring/random-river-and-stream-surveys-in-minnesota.html.

Minnesota random lakes survey

The first Minnesota random lakes survey was conducted in 2007 in partnership with EPA's NLAP survey. The MPCA partnered with the DNR to take advantage of the opportunity presented by the EPA survey to add to Minnesota's base of knowledge about its lakes.

A total of 41 Minnesota lakes were randomly selected by EPA to provide a statistically sound data set for the national survey. To make the data set statistically valid on the scale of Minnesota, a total of 50 lakes were needed. The MPCA and DNR worked together to identify nine additional, randomly selected lakes so that the

resulting data set could be used to develop valid statistics about lakes in Minnesota. In addition, the MPCA and DNR contacted various groups around the state for other ideas on how to make use of this opportunity to gain additional, statistically sound data sets about Minnesota's lakes.

As a result, the following enhancements were added to the base-level program:

- Collaboration with U.S. Forest Service in sampling the Boundary Waters Canoe Area Wilderness.
- Near-shore assessments that included macrophyte identification and determination of maximum rooting depth of plants.
- Sampling in support of lake IBI development.
- Measurement of mercury in the lake water column.
- Measurement of pesticides in the lake water column in conjunction with an ongoing Minnesota Department of Agriculture Program.
- Measurement of contaminants in lake sediments to provide improved lake sediment baseline and spatial data.
- A region-wide assessment of the Prairie Pothole Region conducted in conjunction with North Dakota, South Dakota, Montana and Iowa.

More information is available at: www.pca.state.mn.us/index.php/water/water-types-and-programs/surface-water/lakes/lake-water-quality/national-lakes-assessment-project-nlap.html?menuid=&missing=0&redirect=1.

Minnesota random wetland survey

The MPCA has been involved in planning for the EPA National Aquatic Resource Survey of wetlands, and has been working with EPA to assist with protocol development and reviewing protocols. The EPA survey is designed to provide regional and national estimates of the ecological integrity and biological condition of wetlands.

The MPCA is planning to conduct data collection at Minnesota wetland survey sites in conjunction with the EPA National Wetland Condition Survey in 2011. The MPCA is also revising the protocols of the comprehensive wetland assessment monitoring and mapping survey (started in 2006 for quality and in 2007 for quantity) to better integrate with the EPA Survey.

More information about planning for the EPA National Wetland Condition Survey is available at: www.epa.gov/owow/wetlands/survey/.

Special studies monitoring

The MPCA plans to stay abreast of newly recognized environmental contaminants and other issues that have the potential to cause known or suspected adverse ecological or human health effects but are not well understood, to help inform lawmakers, regulators, the public and industry. The Legislature approved funding for some of these efforts in recent biennial budgets. Partnering with other scientists at universities, state agencies and federal agencies, the MPCA is conducting specific investigations of several key emerging issues of importance to Minnesota.

Pharmaceuticals, household and industrial-use products

The MPCA has been collaborating with researchers from the local and national U.S. Geological Survey (USGS) offices since 2000 and St. Cloud State University since 2004 to further monitor and define health effects associated with this suite of compounds in Minnesota's waters. The first state reconnaissance study by the USGS, the MPCA and the Minnesota Department of Health showed that industrial and household-use compounds and pharmaceuticals are present in streams, groundwater, wastewater and landfill effluents. Steroids, nonprescription drugs and insect repellents were the chemical groups most frequently detected, with detergent degradates and plasticizers measured in the highest concentrations. The complete report may be found at: <http://water.usgs.gov/pubs/sir/2004/5138/>.

In 2010, the MPCA will also sample 150 stream locations for about 25 pharmaceuticals and personal care products as part of the Minnesota random rivers and streams survey.

Endocrine disrupting compounds

Building on the results of the 2002 USGS survey of pharmaceuticals, household and industrial products in the aquatic environment described above, scientists from the USGS, St. Cloud State University (SCSU), the University of Minnesota, the University of St. Thomas, and the MPCA are continuing to investigate the significance, sources, and occurrence of compounds with endocrine-disrupting activity in Minnesota's waste streams and waters.

Endocrine disruption is a broad term referring to both natural and synthetic compounds that cause adverse effects in humans, fish, or wildlife by mimicking or altering the endocrine or hormone systems. Originally, studies of endocrine disrupting chemicals (EDCs) focused on those chemicals affecting the estrogenic, androgenic (testosterone), or thyroid systems of humans and wildlife. However, the scope of interest has expanded to include other signaling chemicals in humans and wildlife, such as neurochemicals.

In January 2008, the MPCA completed a report to the Minnesota Legislature titled *Endocrine Disrupting Compounds*. This report summarizes what is understood about the range of EDCs and their effects on humans, fish, and wildlife, as well as reviewing possibilities for preventing the release of EDCs to the environment and the options for treatment at wastewater treatment plants. The report is available at: www.pca.state.mn.us/index.php/about-mpca/legislative-issues/legislative-reports/legislative-reports.html?menuid=&missing=0&redirect=1.

Subsequently, with special funding from the Minnesota Legislature, the MPCA in cooperation with USGS and SCSU designed and conducted the Statewide EDC Study, which included the analysis of surface water and sediment in 12 Minnesota lakes and four rivers and streams. This study also included an analysis of effects in fish collected from the same locations. The study was completed in June 2009 and can be found at www.pca.state.mn.us/index.php/water/water-monitoring-and-reporting/water-quality-and-pollutants/endocrine-disrupting-compounds.html.

Currently, the MPCA is pursuing three projects focused on EDCs and organic wastewater compounds in the environment. The first study is a survey of 20 wastewater treatment plants across Minnesota, which includes chemical analysis of surface water and sediment as well as limited study of fish at those locations. Preliminary data from this study are available here:

www.pca.state.mn.us/index.php/water/water-monitoring-and-reporting/water-quality-and-pollutants/endocrine-disrupting-compounds.html, with a final report due June, 2011. The second study continues from the 2007-2009 Statewide EDC Study and will examine in more detail the presence and effects of EDCs on a single Minnesota lake from a variety of point and nonpoint sources. Results of the second study will also be reported in June 2011.

Finally, the MPCA is conducting a survey of groundwater in 2010 that will include the sampling of 35 wells in the ambient monitoring network and five wells that are located down gradient of landfills. Ambient wells will be selected in areas that reflect sewered residential, residential areas with septic systems, commercial and industrial land use. Groundwater samples will be analyzed for a suite of chemicals including hormones, pharmaceuticals, EDCs, and other chemicals associated with wastewater effluent.

These studies all pursue investigation of EDCs in the context of environmental protection using a multidisciplinary and collaborative approach, and build on national studies and perspectives.

Perfluorinated chemicals

Perfluorinated chemicals (PFCs) such as perfluorooctanesulfonic acid (PFOS), perfluorooctanic acid, (PFOA), perfluorobutyric acid (PFBA) and others, are manmade chemicals used to manufacture products that are heat and stain resistant and repel water. PFCs used in emulsifier and surfactant applications are found in fabric, carpet and paper coatings, floor polish, shampoos, fire-fighting foam and certain insecticides. PFCs are used to make fluoropolymers, which then are used in the production of many personal care products, textiles, non-stick surfaces and fire-fighting foam. PFCs are widespread and persistent in the environment and they have been found in animals and people all over the globe.

In Minnesota, 3M manufactured PFOS and PFOA from approximately 1950 until they were phased out in 2002. During that time, large volumes of PFCs were released into the Mississippi River in effluent from the 3M Cottage Grove wastewater treatment plant. In addition, four sites in Washington County were identified where 3M disposed of PFC wastes legally prior to the advent of modern solid and hazardous waste laws and regulations aimed at protecting groundwater.

In 2007, the MPCA and 3M entered into a Consent Order regarding the release and discharge of PFCs from certain sites. The consent decree sets forth specific remediation steps that 3M is required to take regarding PFC releases. A copy of the consent decree is available at:

www.pca.state.mn.us/index.php/view-document.html?gid=2860

MPCA investigations have detected PFOS at elevated concentrations in fish taken from the Mississippi River near the 3M Cottage Grove plant and downstream, as well as in metro area lakes with no known connection to 3M's manufacturing or waste disposal. Mississippi River Pool 2, which received 3M Cottage Grove effluent during the years of PFOS and PFOA manufacturing, is listed as impaired water, due to PFOS. This is based on fish tissue PFOS concentrations that prompted the MDH to issue a one-meal per month consumption advisory for certain species in that pool. Preliminary work in advance of a PFOS TMDL for Pool 2 also is underway, and TMDLs likely will be prepared for several PFOS-impaired lakes.

The Consent Order also provided 3M funds for the MPCA to investigate the broader presence of PFCs in the ambient environment and numerous studies are underway to do that. In addition to fish tissue, PFCs have been found in some shallow groundwater wells, in the influent, effluent and sludge of wastewater treatment plants, in ambient air, in blood of bald eagles, and in landfill leachate and gas. Several findings of elevated PFOS concentrations have been traced to chrome platers using legal PFOS-containing products in plating or for chrome mist suppression. The MPCA is working with EPA Region 5 and the local plating trade association on a pilot project to reduce or eliminate PFCs from these operations. The MPCA and the MDH continue to examine potential sources of exposure to PFCs. An extensive description of all MPCA and MDH activities, and links to many PFC-related reports and studies is available on the following webpages: www.pca.state.mn.us/cleanup/pfc/index.html and www.health.state.mn.us/divs/eh/hazardous/topics/pfcshealth.html.

Groundwater

MPCA's Ambient Groundwater Monitoring network is designed to characterize state-wide groundwater quality conditions and trends in non-agricultural areas of the State. Other MPCA groundwater monitoring is conducted for point-source issues through a variety of programs such as remediation programs, permitting programs and landfill programs.

The MPCA's statutory authority is the monitoring of non-agricultural chemicals. The Minnesota Department of Agriculture (MDA) has the statutory authority for monitoring agricultural chemicals. The Minnesota Department of Health monitors to ensure all Minnesotans have safe drinking water and to understand current contaminant levels and trends in water quality that may pose significant health concerns for those drinking it. The relationships and responsibilities for ambient groundwater monitoring among state agencies is outlined in the following document: "Agreement to Operate an Integrated Ground Water Quality Monitoring System for the State of Minnesota," available at www.pca.state.mn.us/water/groundwater/gwqm-agreement.html.

The MPCA ambient groundwater monitoring effort has two primary objectives: 1) to determine the status of groundwater resources and 2) to identify trends in groundwater quality over time. The monitoring effort focuses on assessing two aquifer types that are vulnerable to contamination: surficial sand and gravel aquifers and the Prairie du Chien-Jordan aquifer system. The effort focuses on monitoring urban and undeveloped parts of the state.

The groundwater portion of the Groundwater and Load Monitoring Unit of the Water Monitoring Section of the EAO Division leads ambient ground water monitoring activities at the MPCA. The MPCA is enhancing its monitoring well network on a statewide basis to obtain better information about relationships between land use and groundwater degradation.

Data collection and information storage

The monitoring data collected by the MPCA and others are stored and made available to scientists, citizens, and other interested parties in a variety of ways.

STORET and EQuIS

STORET (short for STOrage and RETrieval) is the EPA repository for water quality, biological and physical data. Until fall 2009, it was supported and maintained by EPA and used by Minnesota, as well as many other state environmental agencies to contain raw biological, chemical, and physical data on surface and groundwater collected by federal, state and local agencies, Indian tribes, volunteer groups, academics and others. The EPA will continue to provide a national warehouse for water quality data, but will no longer support the STORET database. Consequently, the MPCA has been planning for the transition to a new water quality data management system that will fully support Minnesota's needs. The planning process included meeting with internal and external stakeholders to obtain input on potential enhancements and improvements that could be considered in a new database.

The MPCA has selected a commercial software product called EQuIS, <http://www.earthsoft.com/>, to be the new database management system to replace STORET. The MPCA will complete its transition from STORET to EQuIS for surface water and groundwater data by early to mid-2011. More information about STORET is available here: www.pca.state.mn.us/index.php/water/water-monitoring-and-reporting/storet/storet-program.html. For more information about the transition from STORET to EQuIS, see: www.pca.state.mn.us/index.php/water/water-monitoring-and-reporting/storet/storet-redesign.html.

Environmental Data Access

Easily and readily accessible monitoring data help Minnesotans play an active role in protecting and improving their environment. Although the MPCA and other organizations collect large quantities of environmental data, much of it has been difficult to access. The MPCA's Environmental Data Access (EDA) system, available since 2003, allows users to view and download environmental data that are collected and stored by the agency and its partner organizations. EDA was initially set up to share surface water monitoring data, but now also contains groundwater and air quality data. The databases that support the interactive, web-based system are compatible with geographic information systems (GIS) so that monitoring locations can be displayed geographically.

The EDA's water quality section features data from surface water monitoring sites located around Minnesota using either a map or text-based search device. You can also view the conditions of lakes, rivers or streams that have been assessed.

Using EDA's tools, users can:

- quickly access statewide water quality data on a site-by-site basis
- display site-specific data by specifying the name of a lake, river, or other related location
- view the degree of impairment and how impairment affects the use of assessed lakes and streams on a map
- quickly access statewide groundwater quality data from the MPCA's ambient monitoring and closed landfill monitoring program
- access links to related groundwater resources

More information about EDA can be found here: www.pca.state.mn.us/index.php/topics/environmental-data/eda-environmental-data-access/eda-environmental-data-access-home.html.

HYDSTRA

Stream flow data are continuously collected from stations located at the outlets of each of the 81 major watersheds (8-digit HUCs). Stream flow is also collected from many of the intermediate watersheds. These time-series data are stored, managed and made available to agency staff, partners and citizens in HYDSTRA, a unique database and processing software package. The MPCA and DNR are partners in operating and maintaining the HYDSTRA system.

HYDSTRA is a collection of database management tools and hydrologic software packages which allows users to store and organize historical data, graphically analyze and edit hydrologic data, store and access digital photos, maps and other documents associated with stream files. HYDSTRA also offers various output formats, both graphical and tabular, to share stream data with others.

Stream flow, and flood forecast/warning system gage data are automatically downloaded into HYDSTRA via telemetry. Stream flow and stage data collected at DNR Waters' special project sites or reported to DNR Waters by hydropower facility operators are also stored in HYDSTRA. Stream flow and flood warning gage data can be accessed at the DNR/MPCA Cooperative Stream Gaging website at:

www.dnr.state.mn.us/waters/csg/index.html.

The DNR and MPCA are currently in the process of selecting a replacement and upgrade to Hydstra. The replacement time-series database system will be built on a modern platform which will be less complicated and easier to learn and use. The new system will allow for better user control, provide better security, and be more accessible to external data users.

Internal and external partners and stakeholders

Water quality condition monitoring is conducted by the Monitoring Section in the EAO Division of the MPCA.

Additionally, the MPCA partners with many other units of government who conduct monitoring in support of their own activities and operations.

Metropolitan Council Environmental Services

The Metropolitan Council Environmental Services (MCES) has responsibility for facilitating water resource planning in the seven-county Minneapolis/St. Paul metropolitan area, and for developing and implementing regional plans to control water pollution, for managing wastewater treatment, and for characterizing the condition of metropolitan area waters. In support of these responsibilities, MCES conducts extensive monitoring of metropolitan area rivers, streams, lakes, and wastewater treatment plants.

The MCES has been conducting ambient water quality monitoring of the major rivers (Mississippi, Minnesota, and St. Croix) in the seven-county metropolitan area since 1976. Beginning with a focus on conventional pollutants, MCES monitoring now includes biological monitoring; monitoring of toxic substances (metals and organics) in water and sediment; and load monitoring.

MCES added water quality monitoring of lakes to its program in 1980. MCES' lake monitoring program provides baseline water quality and trend information that it uses enhance management decision-making.

MCES has also assisted in the development of volunteer monitoring in the metropolitan area, by providing funding to Watershed Partners for development of a strategic plan and implementation of the Watershed Partners Volunteer Stream Monitoring Program; and in 1992 initiating a Citizen Assisted Monitoring Program (known as CAMP) to involve citizens, lake associations, and local watershed districts in the MCES' lake monitoring efforts.

The MCES also conducts a wastewater treatment plant monitoring program to evaluate the effectiveness of wastewater treatment at eight MCES facilities and to evaluate the need for wastewater treatment plant improvements.

United States Geological Survey

The United States Geological Survey (USGS) has been conducting National Water Quality Assessment (NAWQA) Program studies in the Red River of the North Basin and the Upper Mississippi River Basin. These studies include collection of water quality (chemistry) and aquatic-biological information. Assessment goals are to provide a comprehensive description of water quality conditions, to identify water quality trends, and to determine the factors that affect existing conditions. The Red River of the North study unit was discontinued in the late 1990's because of federal funding shortfalls.

The MPCA coordinates with USGS for ongoing surface water and groundwater quality and quantity monitoring efforts, often contracting with USGS.

The Board of Water and Soil Resources and the USGS are currently engaged in a joint monitoring project to evaluate the effects of retired (set aside) agricultural lands on the water quality and aquatic habitat of streams in the Minnesota River Basin.

Minnesota Department of Agriculture

The Minnesota Department of Agriculture (MDA) has maintained a surface water monitoring system consisting of automated sampling stations in the southern one-third of the state since 1991. The automated stations operate continuously and are set to automatically collect water samples during storm events. Resultant flow-weight composite samples are analyzed for a suite of various pesticides and nutrients. Grab samples (a single sample manually collected) are collected when the streams return to base flow conditions.

The MDA has collected grab samples for pesticide analysis from streams throughout the state since 1990. The department continues to maintain a list of more than 50 sites throughout the state where flow information is available and grab samples may be collected to augment the storm sampling program. Typically anywhere from 15 to 50 streams may be sampled multiple times in any given year depending on available resources. These stream samples are used to aid in extrapolation of information generated from the more rigorous automated sampling stations.

Local units of government

Many local units of government conduct monitoring of lakes, streams, or groundwater as part of the Local Comprehensive Water Management Planning process and other local efforts to manage land use to protect and improve water quality.

Watershed condition assessment

The Clean Water Act requires states to monitor and assess their waters to determine if they are attaining water quality standards. The MPCA collects water quality data from state, local and federal agencies, as well as citizens, and then conducts a rigorous process to complete this assessment.

Regulatory background

To identify and restore impaired waters, Section 303(d) of the Clean Water Act requires states to:

1. Assess all waters of the state to determine if they meet water quality standards (www.pca.state.mn.us/water/tmdl/tmdl-waterquality.html).
2. List waters that do not meet standards (also known as the 303d List) and update every even-numbered year (www.pca.state.mn.us/water/tmdl/tmdl-303dlist.html).
3. Conduct Total Maximum Daily Load (TMDL) studies in order to set pollutant reduction goals needed to restore waters (www.pca.state.mn.us/water/tmdl/tmdl-development.html).

Federal and state regulations and programs also require implementation of restoration measures to meet TMDLs.

The MPCA is the state agency responsible for performing assessment activities, listing impaired waters, and conducting TMDLs in Minnesota. The MPCA also coordinates closely with other state and local agencies on restoration activities.

Figure 6: Assessment data by year

The CWA also requires the MPCA to report to Congress on the condition of the waters of the State under Section 305(b) of the Clean Water Act (CWA). Since 2004, the MPCA has combined the reporting processes for both 305(b) and Section 303(d) into an integrated report, as requested by the EPA.

Aligning the MPCA's assessment process with the watershed approach

Through 2010, the MPCA assessed the condition of the state's waters using an every other year, statewide assessment process. The MPCA is currently revising its assessment process to align with the watershed approach. As described above, the watershed

approach involves intensive monitoring on a subset of major watersheds every year. An annual assessment approach is being designed to keep up with the monitoring work, and reflect the more detailed monitoring data available in the watersheds where intensive watershed monitoring has been completed.

The shift to an annual assessment process is critical to the MPCA's implementation of the overall watershed approach strategy. With assessments taking place immediately following completion of Phase I monitoring, the entire process of monitoring-assessment-restoration-protection can be completed within ten years, at which time the watershed comes up for monitoring again as part of the next scheduled ten-year rotation.

There are three key drivers in the proposed redesign in the assessment process:

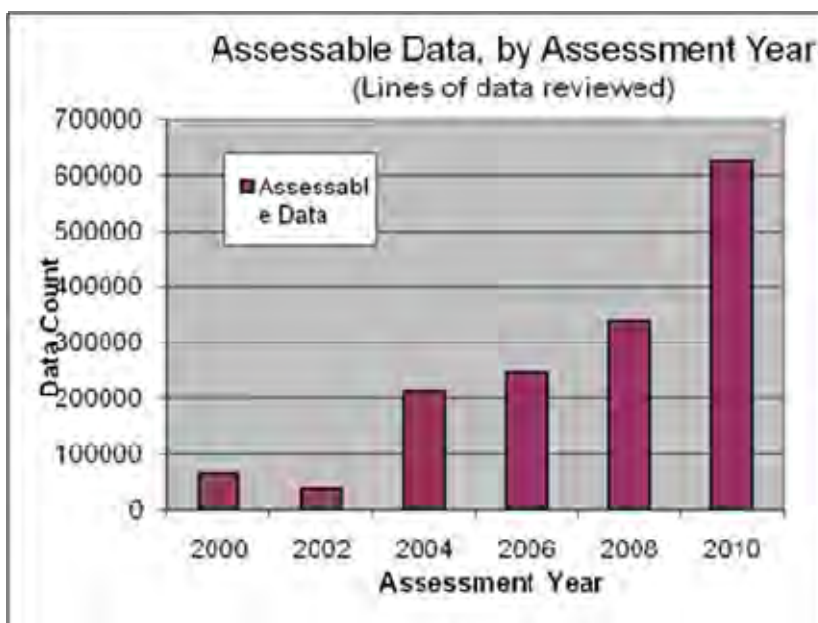
1. The Intensive Watershed Monitoring (IWM) approach and the completion of monitoring on six to eight major watersheds each year.
2. The exponential increase in data available for assessments that the IWM approach presents (see **Figure 6**).
3. The need to identify "unimpaired" waters in need of protection or enhancement, as well as impaired waters, to meet the goals of Minnesota's watershed approach and the state Clean Water Legacy Act (Minnesota Statutes Chapter 114D).

A key outcome of the assessment process redesign will be a more holistic and comprehensive evaluation of the condition of Minnesota's major watersheds, and the individual waterbodies within the watersheds. This information will be captured in the existing assessment database and transparency documents, as well as in a report for each watershed in which waterbodies needing restoration will be identified.

The redesign of the assessment process is a significant undertaking. The MPCA is taking advantage of the window of time that exists between the 2010 and 2012 TMDL List to develop, test and formalize an annual assessment process. Detailed guidance and methods are being developed as part of this redesign effort, and will be posted on the MPCA's assessment webpage as the design is finalized.

Watershed report

The watershed report will provide an accessible but technically focused summary of the monitoring and assessment results that can be used by MPCA staff and informed stakeholders as work proceeds towards watershed restoration and protection. It is currently planned that the watershed report will include background information about the intensive watershed monitoring approach and assessment methodology, and provide generalized information about the watershed, including geologic and hydrogeologic setting, population, land use, cover types, and groundwater quality and quantity concerns. The watershed report will then include a



section discussing the overall condition of the watershed, as indicated by the condition and quality of the lakes, streams, and wetlands determined by the assessment process. Finally, the watershed report will discuss the results from individual sub-watersheds, report on any trends data, and provide basic recommendations for next steps.

The format and content of the watershed report is expected to evolve as the revised assessment process is implemented and needs are more fully identified.

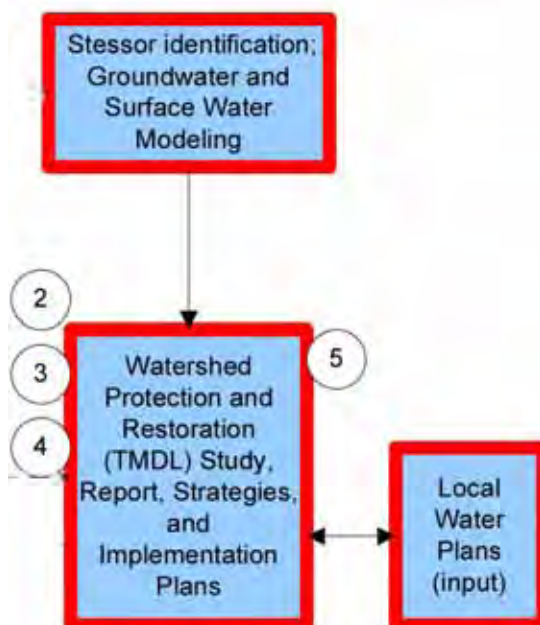
Internal and external partners and stakeholders

The assessment process is built upon the efforts of many different entities, including the MPCA, sister and regional agencies such as the DNR and Met Council, private organizations and citizens. Each of these entities collects data and contributes information from the major watersheds that are used in the assessment process (see Partners and stakeholders in Monitoring section).

The MPCA's shift to the watershed approach creates an opportunity for more MPCA staff and stakeholders to play a significant role in the assessment process. Previously, it was an ongoing challenge to engage local, state and federal partners who are typically focused on smaller management units in major basin or statewide assessments. By organizing assessment activities primarily at the scale of the major watershed, the MPCA is better able to engage these stakeholders and partners because the scale is relevant to them. This, in turn, allows the MPCA to benefit from the wealth of knowledge held by resource managers at the local and regional scale (such as regional fisheries staff, watershed district technicians, etc.).

The alignment of the assessment activities with the watershed schedule also provides partners with notice of when to expect assessment discussions to occur, allowing them to build that activity into their local water plans and other strategic planning efforts. The end result is more holistic assessments that are better understood by local, state and federal partners, and therefore provide a more solid platform from which to launch management activities, and ultimately achievement of water quality goals.

Restoration and Protection Strategy Development



After the TMDL List is developed, staff group impairments on the list into projects, scheduling when the projects are intended to start and end. Adapting to the watershed approach, the 2010 TMDL List (www.pca.state.mn.us/index.php/water/water-types-and-programs/minnesotas-impaired-waters-and-tmdls/assessment-and-listing/303d-list-of-impaired-waters.html?menuid=&missing=0&redirect=1) was grouped by major watershed into watershed projects. In the Twin Cities Metropolitan Area, impairments are grouped into subwatershed projects. This approach will continue out into the future.

The next stage of water resource management includes developing restoration and protection strategies for the state's 81 major watersheds. This work includes identifying what stressors are or may be polluting the waters, developing watershed protection and restoration (including TMDLs) strategies, and working with local partners on water management plans.

Developing watershed restoration (TMDL) and protection strategies and watershed implementation plans⁶

Once MPCA staff and management have selected which watershed projects will take place, MPCA watershed project managers work with consultants and local units of government on developing them. Other MPCA water program areas will participate in watershed restoration and protection strategy development to ensure that all available information is considered, and that implementation measures called for by the watershed project strategies are feasible and can be executed. Some program areas have added staff members who are responsible for better integrating watershed projects into their program areas (namely wastewater and stormwater). Funding for developing watershed studies is available from the Watershed Section-Regional Division. The Watershed Section-Regional Division coordinates MPCA approval of TMDL studies and submittal to EPA for final approval.

Overview

Since the early 2000s, TMDLs have been the focus of watershed planning efforts in Minnesota, and were typically either written for individual or very few lakes or stream segments and for single parameters of concern. Some TMDLs were conducted for regional impairments (Southeast Minnesota fecal coliform TMDL), major watersheds (such as the West Fork Des Moines Watershed TMDL), or for a specific pollutant (statewide Mercury TMDL).

As of September 2010, 43 TMDL studies addressing impaired waters listings have been approved by the U.S. Environmental Protection Agency (EPA). The number of impairments restored to attaining water quality standards due to implementation actions is 13—two lakes and 11 river impairments (see **Figure 7**).

All Minnesota TMDLs that have been approved by the EPA and implementation plans can be viewed on MPCA's website at: www.pca.state.mn.us/index.php/water/water-types-and-programs/minnesotas-impaired-waters-and-tmdls/tmdl-projects/approved-tmdls-and-implementation-plans.html.

Following the transition to the watershed approach, TMDLs will regularly be developed at the full watershed (or subwatershed in the metro area) scale. Additionally, instead of just addressing impairments, the studies will now address both impaired and unimpaired waters. As the agency evolves from developing individual lakes or stream segment TMDLs to watershed restoration and protection strategies, eventually one strategy will be

Figure 7: Impairments delisted due to implementation efforts



⁶ **CPP Element 3:** Process for developing Total Maximum Daily Loads (TMDLs) and individual water-quality based effluent limitations for pollutants in accordance with section 303(d) of the CWA and section 40 CFR § 130.7(a).

written for each of the 81 major watersheds. All watershed restoration and protection strategies should be implemented by 2025.

An interagency watershed protection and restoration strategy development team is working to ensure these new strategies meet TMDL requirements by using data from stressor identification and local studies, using ecosystem models and information, developing watershed models, and setting targets and goals including identification of priority management zones.

Further, watershed restoration and protection strategies will include the development of TMDL implementation plans which identify and document specific areas for BMPs and will include plans to engage citizens of the watershed in the process. Strategies will also take into account goals and objectives contained in existing local water and land use plans, and be advocated for inclusion in local water plan revisions.

Connecting local water management and state water quality programs

Because local water management and state water quality programs are so integrally linked, the MPCA and Board of Water and Soil Resources (BWSR) are pursuing ways to better connect local planning efforts with the new watershed-wide project approach the state is conducting.

The MPCA and BWSR are seeking to build on the depth of analysis required by TMDLs to achieve pollutant reduction or resource protection goals by advocating that the means, measures and mechanisms for reaching these goals be included in the Comprehensive Local Water Management Plans developed and adopted by local government units and subject to state approval. Information on this effort is provided at:

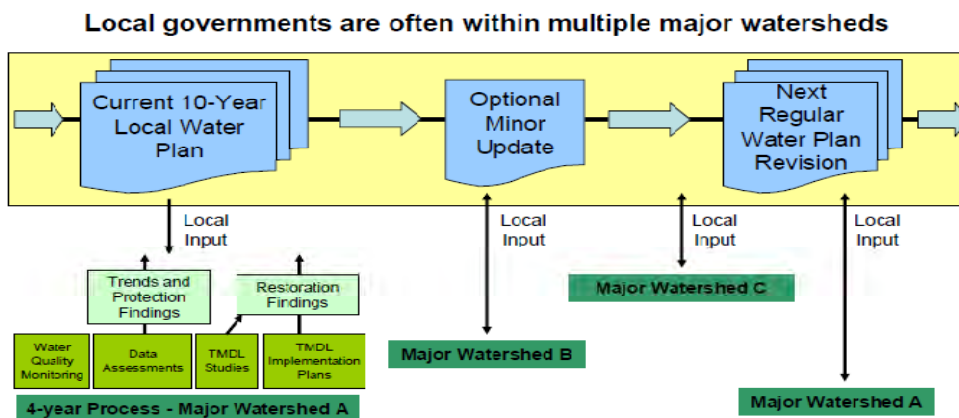
www.bwsr.state.mn.us/planning/PCA-BWSR_TMDL_Memo.pdf.

The MPCA, BWSR and others intend to work with local governments to (see **Figure 8**):

- Incorporate the findings from the water quality assessment into local programs and projects to protect unimpaired waters.
- Integrate the findings and translate the restoration goals from TMDL studies into the local water planning process and related land use programs.

MPCA and BWSR will advocate for incorporation of both restoration and protection findings and goals into the plans and allow local governments to concentrate on implementing measures to improve water quality.

Future adjustments to state programs will be developed to further enhance that state's local water management connection. MPCA and BWSR will continue to inform and update local partners in water planning as the



major watershed approach progresses further.

Figure 8: Local governments within multiple major watersheds

Watershed-wide restoration and protection strategies

The MPCA had already begun developing watershed-wide restoration and protection strategies. The first example was the West Fork Des Moines River Watershed, located in seven counties in southwestern Minnesota. This study focused on restoration of 32 impairments for excessive fecal coliform, turbidity and phosphorus.

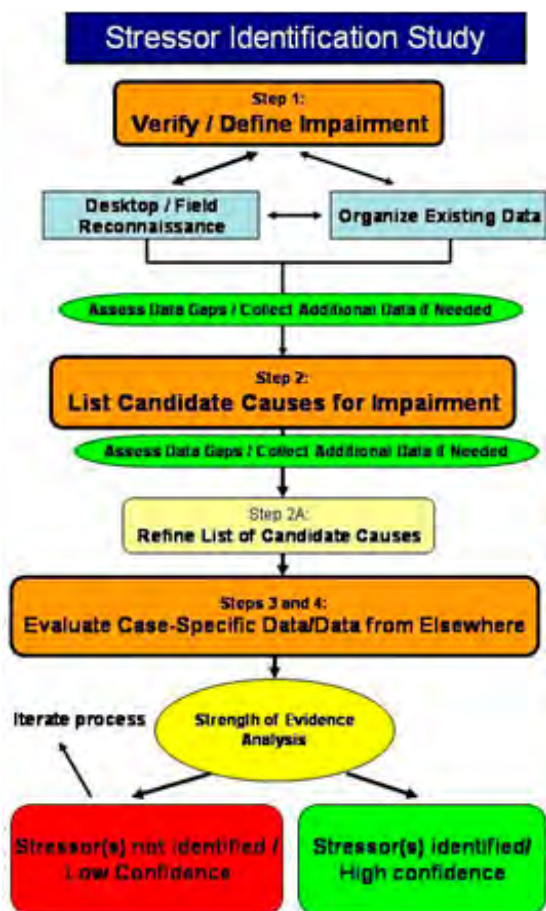
This project was approved by EPA in 2008 and a detailed implementation plan was developed through a process involving a broad range of stakeholders across the watershed. This plan has allowed for increased opportunity for the local stakeholders to apply for funds for various Best Management Practices (BMP) and other actions to restore the impaired waters.

The process of developing strategies

The first step after a waterbody has been identified by monitoring as impaired or in need of protection is to determine what is causing the impairment or threat (see **Figure 9**). This is done through stressor identification and watershed modeling. The activities associated with stressor identification and modeling follow the watershed assessment work of intensive watershed monitoring and are performed on a watershed basis for all impairments in the watershed.

Biological impairments and threats are commonly caused by stressors that are not considered conventional pollutants within water quality rules. These include stressors such as degraded habitat or altered hydrology.

Figure 9: Stressor identification study



Minnesota utilizes the process of stressor identification developed by the EPA to identify the dominant stressors. The process of stressor identification draws upon a broad variety of disciplines such as aquatic ecology, biology, geology, geomorphology, statistics, chemistry, environmental risk assessment, and toxicology. Additional data for this process are collected by MPCA monitoring staff (stressor identification, load monitoring and Regional Office staff) or consulting firms.

In determining impairment and stressors, and ultimately allocating pollutant loads and developing implementation strategies, natural background conditions must be considered, as distinguished from human induced condition. "Natural Background" is a term discussed and used in a number of federal and state water quality regulations, rules, and memoranda. While the exact language differs in various regulations and guidance, all definitions clearly state that natural background conditions are those that exist separate from human (anthropogenic) influences. The meaning of natural background in water quality programs has not changed appreciably over time.

Stressor identification is explained further in the MPCA biotic protocol: www.pca.state.mn.us/publications/wq-iw1-23.pdf or through the EPA stressor ID document: www.epa.gov/waterscience/biocriteria/stressors/stressorid.pdf.

In addition to stressor identification, watershed models will be developed for each of the state's 81 major watersheds. Model development incorporates precipitation, gauging records, and geomorphic cross sections to develop a model that is hydrologically balanced. In some situations, such as groundwater dominated

systems or watersheds with groundwater withdrawal, groundwater analyses will be performed to aid in the understanding of hydrological pathways and relation to the restoration and protection needs.

Watershed model development can begin early in the process (year 1 of 10 year cycle), as the watershed begins intensive watershed monitoring, and stressor identification proceeds after the biological data for the watershed are collected and assessed (year 2 or 3 of 10 year cycle). All watersheds of the state will have watershed models developed by 2020. Watershed modeling is used to develop TMDLs and to evaluate implementation scenarios.

Groundwater

Groundwater can be successfully and usefully investigated as an integral part of watershed restoration and protection strategies. Groundwater plays an important role in the process of identifying relevant TMDL impairment stressors to lakes and streams.

The hydrogeologic summaries in the watershed assessment reports (page 32) will identify whether or not any parts of the watershed are covered by county or regional geologic sensitivity maps. These maps help identify which parts of the watershed are particularly vulnerable to groundwater contamination. The MPCA plans to encourage local organizations to use these maps for planning and zoning activities and for public education. Through these activities, along with identifying and removing or neutralizing the local contamination sources that pose the greatest risk to groundwater, local organizations can substantially reduce the risk of contaminating their groundwater resources and the surface water bodies that are sustained by groundwater.

Geologic sensitivity maps can be used to delineate groundwater protection areas (GWPA) on maps in a manner similar to the way that drinking water supply management areas (DWSMAs) are delineated. This would allow local organizations to adapt and use existing information, guides and tools on the MDH's Source Water Protection program website and MDH's Wellhead Protection website. In addition, local organizations can draw from existing Source Water Protection Plans and Wellhead Protection plans which may already be available for cities in their watershed.

Groundwater and load monitoring unit staff have performed groundwater investigations for selected TMDL project teams to determine the contribution of groundwater to the watershed water balance. Groundwater investigations have been done in collaboration with staff from the MDNR, county and soil water conservation district offices and the University of Minnesota. Assistance has ranged from review of hydrologic datasets to the construction of groundwater models.

In a recent example, a groundwater model was used to identify altered flow of groundwater as a TMDL stressor at Little Rock Creek. Groundwater modeling may also be used at the Amity and Knife Rivers on the Lake Superior North Shore to evaluate proposals to increase groundwater infiltration as a means of reducing bank erosion and increasing baseflow. At Bonanza Valley, several groundwater models are under development, one of which is focused on determining the effect of irrigation pumping on the flows in the North Fork Crow River to determine if this pumping constitutes a TMDL stressor. Legislative funding was allocated for the 2010-11 biennium for four modeling projects to characterize groundwater-surface water interactions in representative areas across the state.

Restoration (TMDLs) and protection efforts

The results of stressor identification and modeling are used to determine the maximum amount of a pollutant a waterbody can receive and still meet water quality standards for that pollutant. For an impaired waterbody, this is the TMDL. The goal of a TMDL is to quantify the pollutant reductions needed to meet state water quality standards and to allocate those reductions among sources in a way that is technically and socially feasible. For an unimpaired waterbody, this analysis helps to set goals for preventing impairments from occurring. Stressor identification and modeling also identify all the sources of the pollutant causing impairment or impacting waterbodies and allocate necessary reductions among them. During this process, priority management zones (PMZs) are also identified – meaning areas that contribute disproportionately high amounts of pollution, based on environmental sensitivity of an area and pollution output by source(s) in the area.

This multi-year effort results in a pollution reduction approach and engages stakeholders and the general public. An approved TMDL is followed by implementation planning and activities for achieving the necessary reductions. Watershed protection strategies provide similar information and direction for unimpaired waters.

TMDL implementation plans and protection efforts provide strategies of management and conservation practices necessary for the watersheds to reach or maintain water quality standards. The activities and Best Management Practices (BMPs) identified should reflect agreements made among experts, citizens and stakeholders within a particular watershed. These agreements may take a number of months to reach through extensive dialogue and the consequences of various options. BMPs should target the priority management zones to be most efficient and to have the best chance at improving environmental conditions.

TMDL implementation plans must be completed within one year after the EPA approves a TMDL study. TMDL implementation plans and watershed protection strategies include EPA's nine elements of watershed plans, ensuring Section 319 eligibility for funding of implementation activities (water.epa.gov/pd/waste/nps/upload/2008_04_18_NPS_watershed-handbook_ch02.pdf).

An adaptive management approach will be taken in implementing watershed protection and restoration strategies to encourage continual evaluation and the re-examination of approaches and strategies over time. The implementation plan should be a living document revised periodically based on civic engagement, ongoing condition and effectiveness monitoring and ongoing tracking of BMP implementation progress.

As the transition to the watershed approach continues, the MPCA is working with other state agencies and local partners to determine how to best integrate watershed protection and restoration planning efforts and strategies into local water planning processes and plans.

Restoring Our Waters: A Starter Guide to TMDL Projects summarizes the TMDL process and is available at: www.pca.state.mn.us/index.php/water/water-types-and-programs/minnesotas-impaired-waters-and-tmdls/project-resources/tmdl-starter-guide.html.

Total Maximum Daily Load development protocols

The MPCA has produced five TMDL development protocols for the impaired waters listing parameters of low dissolved oxygen, turbidity, coliform bacteria, nutrients, and biota. The purposes of these protocols are: to provide clarity for the process of developing TMDLs; to enable TMDLs to be developed in a technically rigorous way to ensure their quality and enhance their implementation; and to promote consistency in the development of TMDLs.

The protocols are not rules, but are guidance to help facilitate TMDL development. These protocols reflect the current best knowledge about developing TMDLs. As more experience with TMDL development is gained, the protocols will be improved over time. They are technical documents intended for use by TMDL practitioners:

- Bacteria TMDL Protocols and Submittal Requirements: www.pca.state.mn.us/index.php/download-document.html?gid=8526
- Biota TMDL Protocols and Submittal Requirements Draft: www.pca.state.mn.us/index.php/download-document.html?gid=8524
- Dissolve Oxygen TMDL Protocols and Submittal Requirements: www.pca.state.mn.us/index.php/download-document.html?gid=8529
- Lake Nutrient TMDL Protocols and Submittal Requirements: www.pca.state.mn.us/index.php/download-document.html?gid=8069
- Turbidity TMDL Protocols and Submittal Requirements: www.pca.state.mn.us/index.php/download-document.html?gid=8525

Civic engagement

In the past, watershed studies and implementation plans were often developed with limited involvement from the public. Citizens and stakeholders were typically consulted at the end of the planning process when they could have little impact on proposed policies and strategies. This approach did not prove effective in encouraging local ownership of the plans or in increasing the number of citizens willing to implement BMPs and other behavior changes that would benefit water quality.

Hearing the call from the citizens of Minnesota who passed the Clean Water, Land, and Legacy Constitutional Amendment and from the members of the Clean Water Council, the MPCA recognized that a more deliberate and strategic approach must be developed to increase citizen involvement in restoring and protecting Minnesota waters and to empower citizens to become the agents of change in their communities. In doing so, the MPCA recognizes:

- Each watershed is a system, with dynamic relationships among human, biological and physical components
- Citizen and stakeholders need to be involved at every stage of the watershed planning process, supported by the relevant state and local agencies to ensure success.
- Special effort must be made to build and maintain trusting relationships among public officials and members of a watershed community, to ensure that there is a lasting foundation for watershed protection and community involvement.
- The burden must shift from reliance on government agencies to restore water quality, to citizens themselves taking charge and making progress using support and resources from the public agencies involved. The challenge involves defining more sharply the respective responsibilities of state agencies, local entities and citizens as this shift evolves.

In future years, civic engagement will receive greater emphasis within the context of watershed planning and management activities across the state. The amount of services and support provided to local agencies and organizations working with citizens will vary depending on the needs within a specific community, their existing staffing levels, and the experience and support they may already have.

Over the coming years, with the help of the citizens of Minnesota, MPCA intends to develop new approaches to encouraging civic engagement, support the development of community capacity in watersheds working to address pollution problems, and by developing and encouraging the use of these products and services:

- **A Civic Engagement Planning Cycle** - a strategic framework that can be used to create a civic engagement action plan in each watershed. This framework allows communities to create their own vision for empowering citizens and building the community capacity needed to support water quality problems over the long term, while also allowing projects to track and report successes and the challenges in doing so.
- An interactive, multimedia **Idea Bank** of stories, testimonials, best practices for civic engagement, sample documents, technologies, techniques and methods to help project teams think outside the box when engaging citizens.
- **A Specialist Network** which will provide watershed project teams access to experts in areas such as:
 - group process (facilitation, conflict management, communication strategies, etc.) and civic leadership development
 - technology and creative services (interactive kiosks, physical computing, on-line social networking, data visualization, etc.)
 - funding strategists and grant writers
 - evaluation and performance tracking tools
- **A Practitioners' Forum** to tap and allow for the sharing of collective knowledge and experience among people in the field, and connecting and optimizing resources, approaches and ideas.
- **A Performance Tracking Framework** that provides a means for local citizens and state/local government agencies to track progress in citizen involvement, to document real accomplishments, and communicate success to key sponsors and other stakeholders.

Restoration and protection funding

Funding is available for restoration and protection studies and strategy development through direct legislative appropriations of state dollars, with a large portion of the funds coming from the Clean Water, Land and Legacy Amendment Fund. Amendment funds are appropriated each fiscal biennium to several state environmental agencies for water protection efforts and are managed through interagency initiatives.

Internal and external partners and stakeholders

Model development and stressor identification is led by the Technical Assistance Unit in the Watershed Section along with other units in the Regional Offices and the Groundwater and Load Monitoring Unit of the Water Monitoring Section. Partners such as DNR and local units of government offer assistance in the stressor identification process incorporating their knowledge and skills. They offer assistance with watershed knowledge, past biota collection information, geomorphology knowledge, and technical skills.

The MPCA staff in the Regional Division leads the development of watershed restoration and protection strategies, with support from the EAO, Municipal and Industrial Divisions, and other state agencies. The MPCA typically contracts with local government units and with private contractors to carry out watershed studies and strategy development.

External partners primarily include Local Government Units, BWSR, MDA, DNR, MCES, and MDH.

Other water planning efforts⁷

Water planning efforts occur at all levels of government: federal, state and local. This section describes a short summary of other water planning efforts that are underway in Minnesota.

Federal: Minnesota's Nonpoint Source Management Program Plan

The Regional Division Watershed Section coordinates preparation of the Minnesota's Nonpoint Source Management Program Plan (NSMPP), which is a requirement for Section 319 nonpoint source funding through Section 319 of the US Clean Water Act. Section 319 funds are used for implementing completed TMDLs and watershed plans developed through the watershed approach, and for addressing research and development needs. The most recent update of Minnesota's NSMPP was approved by the EPA in 2008. The plan can be found at: www.pca.state.mn.us/water/nonpoint/mplan.html.

The Regional Division Watershed Section leads development of the NSMPP and coordinates 17 Technical Committees comprised of more than 200 individuals, representing more than 50 federal, state, and local governmental units, and public and private organizations.

State: Minnesota Water Plan

The Environmental Quality Board (EQB) brings together the Governor's Office (as chair), five citizens and the heads of nine state agencies that play a vital role in Minnesota's environment and development. The board develops policy, creates long-range plans and reviews proposed projects that would significantly influence Minnesota's environment.

Required by state law, the EQB coordinates a comprehensive long-range water resources State Water Plan every ten years. The 2010 draft State Water Plan presently open for public review was prepared in cooperation with EQB member agencies and is the latest in a long history of bringing together agencies and others with an interest in achieving sustainable water management. The many local, regional and state stakeholder efforts convened in recent years also were an important part of this effort. The draft plan was prepared with a long-term vision oriented to protecting Minnesota's water resources for generations to come. Information on Minnesota's Draft 2010-2020 State Water Plan is available at: www.eqb.state.mn.us/project.html?Id=19166.

⁷ **CPP Element 4.** Process for updating and maintaining Water Quality Management Plans, including schedules for revisions.

CPP Element 5: A process for assuring adequate authority for intergovernmental cooperation in the implementation of the state Water Quality Management program.

State: University of Minnesota – Minnesota Water Sustainability Framework

The goal of the Minnesota Water Sustainability Framework is to develop a 25-year comprehensive statewide sustainable water resources detailed framework to protect, conserve, and enhance the quantity and quality of the state's groundwater and surface water.

The University of Minnesota's Water Resources Center has been charged by the Minnesota State Legislature to develop the framework for sustainable water management, a set of recommendations that will protect and preserve Minnesota's lakes, streams, rivers and groundwater for the 21st century and beyond without compromising people's current needs, water quality or natural ecosystems.

The plan, titled "Minnesota Water Sustainability Framework," will be presented for recommendation to the legislature in January of 2011. Information on the Framework is available at:

<http://wrc.umn.edu/watersustainabilityframework/index.htm#why>.

Region: Specific planning and coordination efforts

As a geographically large and diverse state, Minnesota is home to many interstate, international and intrastate regional planning efforts. Groups and efforts the MPCA cooperates with include the Upper Mississippi River Basin Association, Great Lakes Initiative, International Joint Commission on the Rainy River, International Red River Board, Red River Watershed Management Board, St. Croix Basin Team, Basin Alliance for the Lower Mississippi in Minnesota, Red River Basin Commission and the Minnesota River Board.

Local: Water management programs

While the MPCA is charged with implementing the Clean Water Act and state water laws and rules, the agency also participates in local water plan development. Local water management planning is required by statute; the method for developing these plans is different in greater Minnesota than the seven-county Metropolitan area. Overall program coordination is performed by the Board of Water and Soil Resources (BWSR), though MPCA participates in the process by promoting the incorporation of information and findings from MPCA watershed work.

For local water management programs, the Regional Division Watershed Section and Regional Offices coordinate the greater Minnesota county effort and the Metro and St. Croix Unit coordinates the metro program.

Externally, state review agencies that have opportunities to provide input to the county for consideration in their Local Water Management (LWM) plan consist of: BWSR, the Minnesota Department of Agriculture (MDA), the Minnesota Department of Health (MDH), the Minnesota Department of Natural Resources (DNR) and other agencies granted state review status by a resolution of the BWSR.

Greater Minnesota counties

Eighty counties in greater Minnesota develop Local Water Management (LWM) plans on a five or ten year basis. The LWM planning processes follow a prescribed process:

LWM program phases	MPCA action
<p><i>Phase 1 Priority Concerns:</i></p> <p>Prior to developing their plans, the LWM plan authority sends a notice to local government units partially or wholly within the planning jurisdiction, adjacent counties, and state review agencies of their intent to revise the LWM Plan. At the MPCA, the Watershed Section-Regional Division coordinates the review process and works with Regional Offices and other water program areas to provide comments to the counties on nonpoint source pollution water quality concerns recommended to be addressed in the upcoming LWM Plan. Coordination with other program areas including feedlots, SSTS, storm water, and wetlands takes place through this process.</p>	<p>Review request for MPCA priority concerns and provide letter to the county expressing priority concerns the MPCA recommends be addressed in the LWM Plan.</p>
<p><i>Phase 2 Priority Concerns Scoping Documents (PCSD):</i></p> <p>PCSDs are submitted by the counties to state agencies for comment.</p>	<p>Review PCSD including the priority concerns the county recommends be addressed in the LWM Plan. Review includes evaluating how they were selected, and why some priority concerns weren't selected. MPCA provides letter to BWSR concurring with or requesting further consideration of priority concerns.</p>
<p><i>Phase 3 LWM Plan:</i></p> <p>Draft LWM Plans are submitted for review.</p>	<p>Review the LWM plan for legality regarding MPCA rules, and for general content. MPCA must inform BWSR that the LWM does or does not violate statutes or rules administered by MPCA. MPCA comments on any items recommended be changed or added to the plan. Comments also provide recommendations and information to assist the County over the life of the LWM Plan.</p>
<p><i>Phase 4 LWM Plan Amendments:</i></p> <p>BWSR's order granting approval of a 10-Year LWM Plan requires amending the Implementation Section (Goals, Objectives and Actions) within 5 years of approval.</p>	<p>Provide comments to the County providing recommendations to amend the LWM Plan for the second 5 year period of the 10-Year LWM Plan.</p>

Watershed districts – statewide

Watershed districts are local units of government that work to solve and prevent water-related problems. The boundaries of the districts follow those of a natural watershed (an area in which all water drains to one point). Minnesota has 46 watershed districts. Minnesota's watershed districts do not cover the entire state. They are created through a local petition process. Laws that affect watershed districts are in Minnesota Statutes 103D: www.revisor.leg.state.mn.us/stats/103D/.

Watershed districts deal with a wide variety of water-related concerns, including water quantity (flood damage reduction) and water quality, including wetlands and groundwater management. Many districts work cooperatively with other local organizations such as cities, counties, Soil and Water Conservation Districts, non-profit and private wildlife groups, and community organizations to work toward common water management goals. Watershed districts engage in varied water resources activities and projects, which differ by location, size, resources and land use. Some watershed district activities and projects include, but are not limited to:

- Streambank restoration
- Flood control structures
- Nutrient loading reduction
- Monitoring studies
- Dredging and channel excavation
- Internship programs
- Erosion control projects
- Stormwater management
- Wetland restoration
- Agricultural land buffering
- Hydrologic model development
- Aerial environmental surveys
- Natural resources inventories
- Public education and outreach
- Stormwater management
- Farmstead ring dikes
- Local cost-share programs
- Dam and ditch repair and assessment
- Ditch repair and assessment
- Feedlot pollution reduction
- Best management practices

Each watershed district is governed by a board of managers appointed by the county boards of commissioners with land in the watershed district. Each watershed district is also required to have a citizen advisory committee to provide input to the managers on projects and activities. Many watershed districts have paid, full-time staff; others rely on contract employees, primarily for engineering and legal services.

Watershed districts have been given broad authorities, including the authority to:

- Adopt rules with the power of law to regulate, conserve, and control the use of water resources within the district.
- Contract with units of government and private and public corporations to carry out water resource management projects.
- Hire staff and contract with consultants.
- Assess properties for benefits received and levy taxes to finance district administration.
- Accept grant funds, both public and private, and encumber debt.
- Acquire property needed for projects.
- Acquire, construct, and operate drainage systems, dams, dikes, reservoirs, and water supply systems.
- Enter upon lands within and without the district to make surveys and conduct investigations.

Minnesota Statutes 103D.405 requires 10-year revisions for local water plans. After ten years and six months from the date that BWSR approved a watershed management plan or the last revised plan, managers of the watershed district must adopt a revised watershed management plan outline and send a copy to the BWSR. BWSR adopts recommendations regarding the revised outline and sends recommendations to the watershed district. After receiving BWSR's recommendations regarding the revised outline, the watershed managers must complete the revised watershed management plan.

Revised Watershed Management Plans must be sent to BWSR, the county board and county auditor of each county affected by the watershed district, the director of Division of Waters of the DNR, the governing body of each municipality affected by the watershed district, soil and water conservation districts affected by the watershed district, and the Metropolitan Council, if the watershed district is within the 7-county Twin Cities (TCMA) metropolitan area.

Some watershed districts in the 80 counties outside the metropolitan area have voluntarily requested MPCA's review and comment on their watershed plans. MPCA responds to these requests by providing comments on draft plans.

Metro surface water management (Twin Cities Metro Area TCMA)

In 1982, the Minnesota Legislature approved the Metropolitan Area Surface Water Management Act (Minnesota Statutes 103B.201 to 255) requiring watershed districts or watershed management organizations

(WD/WMO) in the TCMA to prepare and implement comprehensive surface water management plans. WMOs are based on watershed boundaries, and can be organized in three ways:

- As a joint powers agreement between the cities and townships within the watershed.
- As a watershed district — a special unit of local government operating under Minnesota Statutes Chapter 103B, and concurrently operating under Minnesota Statutes Chapter 103D.
- As a function of county government, usually administered by the county planning department.

In 1992, BWSR developed Minnesota Rule Chapter 8410 to determine the Plan content. This rule also requires that Plans are revised every five to ten years.

In the TCMA, watershed planning is conducted at the minor watershed scale, aligned with the boundaries and planning efforts of the ~35 watershed districts and watershed management organizations in the TCMA. In participating in the local planning processes and reviewing and commenting on planning documents, MPCA Watershed Section staff coordinates reviews with staff of other program areas, including wetlands, stormwater, etc.

Watershed districts and Watershed Management Organizations have many similarities, including the requirement to conduct their activities according to an approved watershed management plan. In addition to plan requirements in statute, metro area watershed districts and watershed management organizations must also abide by Minnesota Rules Chapter 8410 www.revisor.leg.state.mn.us/arule/8410/, which spells out detailed plan requirements. Watershed management organizations differ from watershed districts in a number of ways:

- WMOs are mandatory, not voluntary.
- WMOs deal only with surface water; whereas watershed districts manage surface water and groundwater (metro area counties handle groundwater planning).
- WMOs do not have individual taxing authority, unless their joint powers agreement specifically grants this authority, and most are funded by the municipalities that make up their membership.
- WMOs are governed by a board appointed by the member municipalities and townships.

The local water management plan authority is required to send a notice to local government units (LGUs) of the intent to revise their existing Plans, allowing these LGUs to participate in the development and review of the Plan content. Notice of a Plan revision must include an invitation for all recipients to submit priority concerns they wish to see the Plan address. BWSR recommends that the Plan revision process begin at least 18 months prior to expiration of the existing Plan. The MPCA goal is to respond to concerns and participate early in the Plan development process. An opportunity to participate in the stakeholder process will ensure that all MPCA objectives will be incorporated in the final watershed management plan and the WDs/WMOs will be able to work more efficiently in their watershed management plan development process.

The following outline describes MPCA roles and responsibilities for participation in the watershed management plan development process in the metro area:

- Participate on Plan stakeholder and/or Advisory teams at the beginning of the process, as needed.
- Provide data/information to WDs/WMOs as needed to develop a complete Plan.
- Provide guidance to enable WDs/WMOs to identify MPCA goals early in the process.
- Provide guidance to WDs/WMOs so they will be able to access available data in their watershed district.
- Attend regularly scheduled stakeholder meetings, when appropriate.
- Review and provide comments on the final draft water management plan.
- Assure consistent approach for all WDs/WMOs water management plan.

Details on MPCA involvement in Metro Surface Water Management planning can be found at: www.pca.state.mn.us/water/basins/watershedplan.html.

Municipal comprehensive plans – TCMA local water plans

Watershed Plans are developed for watershed areas in the TCMA as required by Minnesota Statute 103B and implemented through Minnesota Rules 8410. In the TCMA, municipalities and townships develop Local Water Plans as part of their Comprehensive Plans required under MS 473.858. Local Water Plans are a component of the Comprehensive Plans and are required to reflect the requirements of Watershed Plans approved by the Board of Water and Soil Resources.

Details of these programs are provided at the Metropolitan Council website at:

www.metrocouncil.org/planning/environment/WRMPP/WRMPPMay2005_SurfaceWaterManagement.pdf

Metro groundwater plans

In 1987, TCMA counties were given the authority to prepare and adopt groundwater plans through Minnesota Statutes Chapter 473.8785 (now 103B.255). That provided a mechanism for counties to set priorities, address issues, and build local capacity for the protection and management of groundwater. This is an important issue in the TCMA. Counties in the area have a high reliance on their groundwater for their domestic, municipal, industrial, and agricultural water supplies.

The Board of Water and Soil Resources (BWSR) sent information and guidelines to counties for the metropolitan county groundwater plans in early 1990. BWSR awarded matching grants of \$15,600 to the six metropolitan counties preparing plans. Metropolitan counties with approved groundwater plans can use matching grants to implement items in their plans.

A number of successes have come out of this planning process. Every county in the TCMA has technical groundwater capacity at some level. Additional details, including a progress report on groundwater planning in seven metro area counties can be found on BWSR's Metro Groundwater Planning webpage:

www.bwsr.state.mn.us/planning/groundwater.html.

Source water protection plans

A Source Water Assessment is a document produced by MDH staff that is intended to provide basic information to public water suppliers and the general public regarding:

1. Where their drinking water comes from.
2. The degree to which it may be impacted by potential sources of contamination.

Specifically, a source water assessment includes the following:

- The status of a public water system's source water protection plan.
- A description of the water source(s) used by the public water system.
- A determination of the susceptibility of the water sources to contamination.
- A list of contaminants of concern for the water source(s) and potential contaminant sources that could impact the water supply.

The MDH has completed "source water assessments" for all of the approximately 7,000 public water systems in the state. Each assessment provides a concise summary of available information regarding the source(s) – such as a well, lake, or river - supplying a public water system. Additional information can be found on the MDH Source Water Assessments webpage www.health.state.mn.us/divs/eh/water/swp/swa/index.htm.

Wellhead protection plans

Wellhead protection is a way to prevent drinking water from becoming polluted by managing potential sources of contamination in the area which supplies water to a public well. Much can be done to prevent pollution, such as the wise use of land and chemicals. Public health is protected and expense of treating polluted water or drilling new wells is avoided through wellhead protection efforts. Wellhead protection plans are developed by the water system and its wellhead protection planning team.

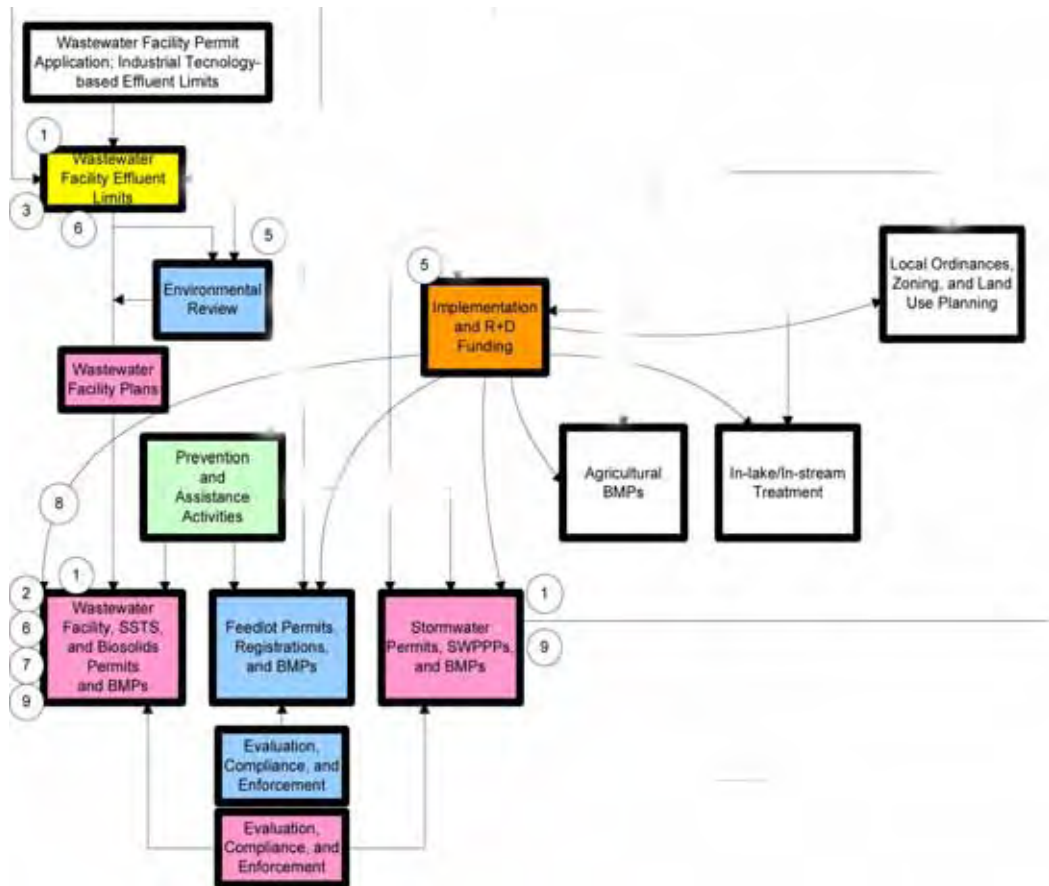
Wellhead protection is a means of protecting public water supply wells by preventing contaminants from entering the area that contributes water to the well or well field over a period of time. The wellhead protection area is determined by using geologic and hydrologic criteria, such as the physical characteristics of the aquifer and the effects which pumping has on the rate and direction of groundwater movement. A management plan is developed for the wellhead protection area that includes inventorying potential sources of groundwater contamination, monitoring for the presence of specific contaminants, and managing existing and future land and water uses that pose a threat to groundwater quality.

The long-term goals of wellhead protection are to:

- Reduce the use of costly treatment facilities.
- Avoid the drilling of new wells.
- Avoid the need to clean up contaminated groundwater.

The MDH wellhead protection webpage www.health.state.mn.us/divs/eh/water/swp/whp/index.htm includes additional information such as guidance, fact sheets and applicable rules and laws.

Implementation



After the completion of water quality monitoring and assessment, and the development of watershed restoration and protection strategies, implementation activities recommended in those strategies occur. The MPCA has regulatory authority for certain permitted activities, while other state and local entities work on non-permitted implementation activities. For regulated activities, certain statewide rules and statutes apply across the board, but where implementation is discretionary; the allocation of resources follows on planning that targets the highest priority implementation areas and activities.

Wastewater

The wastewater program area addresses MPCA's legislative requirements and the NPDES authorization agreement with EPA. These activities are described in MPCA Strategic Plan goals, EnPPA goals, and the annual Wastewater Point Source Plan goals. Ensuring that these goals are met is how the program area contributes to adequate implementation of water quality standards.⁸

Wastewater point source discharges enter lakes, streams, wetlands or other surface waters through a pipe, ditch, or other well defined point of release. All SSTS subsurface discharges greater than 10,000 gallons per day and all surface water discharges of any size are not allowed in Minnesota without a permit from the state (Minnesota Rules 7080). Permits are issued under the National Pollution Discharge Elimination System (NPDES) program, required by the Clean Water Act and delegated to Minnesota from EPA and/or under that State Disposal System (Minnesota Rules 7001).

The concentration and amount of each specific pollutant that may be discharged into the water is defined in the NPDES permit; this allowable amount is called an effluent limit. State Disposal System (SDS) permits regulate the construction and operation of wastewater disposal systems, including land treatment systems. Together, NPDES/SDS permits establish specific limits and requirements to protect Minnesota's surface and groundwater quality for a variety of uses, including drinking water, fishing and recreation and ensure water quality standards are met.

NPDES/SDS facility permit application

Any industrial, municipal or private entity point source that proposes to discharge treated wastewater to surface waters of the state must apply for the permit. An NPDES/SDS permit establishes the terms and conditions that must be met when a facility discharges wastewater to surface or groundwaters of the state.⁹

Individual permit requirements vary case by case, and information provided on the application helps the MPCA determine which regulatory requirements to apply in the permit. The application requests information on wastewater characteristics, design flows of the facility, the route which treated wastewater will travel to a surface water body, and a description of the existing treatment system or the system to be built. The application may also request information regarding the design influent concentrations for carbonaceous biochemical oxygen demand (CBOD), total suspended solids (TSS), total phosphorus and

Environmental review

The MPCA conducts environmental review for large wastewater treatment facility projects, collection system projects, feedlots and industrial projects which exceed thresholds contained in Minn. R. 4410.4300 [link here]. The primary document is an Environmental Assessment Worksheet (EAW), which is similar in scope and content to the Environmental Assessment required under NEPA (National Environmental Policy Act).

The EAW provides other governmental units and the public with usable and understandable information on the environmental impacts of the project and explains how the project and its water-based permits fit within the context of TMDL-related activities and water planning activities of local government units in the watershed. This helps to ensure that new projects and permits conform with and contribute to identified watershed goals and objectives, including efforts to achieve TMDLs and execute state-approved TMDL implementation plans. The preparation and public notice of permits and EAWs are done concurrently; however, the granting of permits or approvals by units of government is prohibited until the environmental review process is completed.

During the preparation of an EAW, the MPCA obtains information from project proposers, other governmental units and MPCA staff involved in permit development. Information is also obtained from agencies and the public as a result of comments received and responses given to them. Staff is knowledgeable in permits, planning and/or TMDL activities specific to the watershed in which the project is located. Environmental review project managers also maintain contacts with environmental staff at local governmental units. The EAW process concludes with a decision by the responsible governmental unit whether or not an Environmental Impact Statement (EIS) is needed to further assess impacts and identify additional mitigation measures.

In a typical year, 18 – 20 project EAWs are prepared by the MPCA, of which 6 – 8 are wastewater systems and 8 – 10 are feedlots. To see new and archived EAWs or EISs, visit: www.pca.state.mn.us/news/eaw/index.html.

⁸ **CPP Element 6:** A process for establishing and assuring adequate implementation of new or revised water quality standards, including schedules of compliance, under Section 303(c) of the CWA.

⁹ **CPP Element 5:** A process for assuring adequate authority for intergovernmental cooperation in the implementation of the state Water Quality Management program.

ammonia nitrogen, and a description of industrial flows to the treatment works. MPCA staff may contact the applicant during the process of reviewing and developing the permit to get additional information.

When all necessary information has been submitted with the permit application, the MPCA will determine if an environmental review process needs to occur.

Under Minnesota's environmental review rules (Minn. R. 4410.4300, subp. 18) an Environmental Assessment Worksheet (EAW) is required for the construction of a new municipal or industrial wastewater treatment facility with a design flow of 200,000 gallons per day or more, or the expansion of an existing wastewater treatment facility which increases its design flow by 50 percent or more and by at least 200,000 gallons per day. If a project triggers the EAW process, a 30-day comment period is provided. The public notice for the proposed permit is conducted concurrently. No permits can be issued until completion of a mandatory environmental review.

Comments received during this period may result in revisions to the draft permit. When all concerns are adequately addressed, a final permit is issued and its conditions become effective upon issuance. The process of permit application and public participation can be quite lengthy. To ensure timely permit issuance, applicants should contact the MPCA as early as possible to start the exchange of information.

Permits are also reviewed and updated as they expire every five years, allowing the MPCA to incorporate new information about the impacts of pollutants to the environment in subsequent permits. Permits are enforced through a combination of self-reporting (reports to the MPCA, EPA or both) and compliance monitoring.

Additionally, any time a wastewater facility discharges into an impaired water, or water that needs special protection, the wastewater program participates in restoration and protection strategy development. Implementation efforts ensure appropriate wastewater point source requirements are factored into the strategy development and the requirements are properly implemented according to the waste load allocations and schedule.

Facility types

There are two types of facilities: municipal and industrial. Municipal facilities that process primarily wastewater from domestic sources (sewage) are considered municipal facilities. These include city wastewater districts, sanitary districts, wayside rest areas, national or state parks, mobile home parks, and resorts. The discharges from public water supplies also fall under municipal permitting. Municipal permits can be "major," "minor," or "general," depending upon how much wastewater is discharged and what types of pollutants might be found in the wastewater.

Industrial facility permits may cover a number of different waste types and activities, including: industrial process wastewater, contact and non-contact cooling water, stormwater, contaminated groundwater pumpouts, water supply treatment backwash and wastewater treatment sludges. Several general NPDES/SDS permits also are available. NPDES/SDS permit requirements may include monitoring, limits, and management practices designed to protect surface and ground water quality and meet water quality rules and standards.

Effluent limits

Effluent limits establish the numeric pollutant limits and requirements that incorporate the many facets of the water quality rules and standards into permits including, TMDL wasteload allocations (WLAs), nondegradation reviews, and variance procedures.¹⁰

The MPCA develops NPDES and SDS effluent limits and compliance schedules for permittees in accordance with federal law and state statute and rules. Minnesota's water quality standards and the designated uses of

¹⁰ **CPP Element 2:** A process for incorporating elements of any applicable area-wide waste treatment plans under section 208, and applicable basin plans under section 209 of the CWA. **CPP Element 3:** Process for developing Total Maximum Daily Loads (TMDLs) and individual water-quality based effluent limitations for pollutants in accordance with section 303(d) of the CWA and section 40 CFR § 130.7(a).

waters of the state are specified in Minn. R. chs. 7050 and 7052, with additional point source requirements in Minn. R. ch. 7053 (www.revisor.mn.gov/rules/?agency=167).

The relevant state requirements are detailed in these rules and a number of MPCA and EPA publications (www.pca.state.mn.us/publications/wq-wwprm1-02.pdf; www.pca.state.mn.us/water/wastewater.html, and <http://cfpub.epa.gov/npdes>).

The purpose of an effluent limit (EL) review is to:

- Determine if a new or expanding wastewater NPDES applicant triggers nondegradation review.
- Develop limitations for new and reissued NPDES permits for wastewater discharges.
- Determine if new limits are needed or, alternatively, confirm whether existing limits (reissuance of NPDES permits every five years) are appropriate.
- Incorporate any new or revised WQSs or EPA guidance into ELs or monitoring requirements.
- Integrate other water programs into the review process (biological monitoring, wetland review, TMDLs, watershed planning).

Nondegradation reviews: The first step in the effluent limit process for new or expanding NPDES discharges is to determine if the facility triggers a nondegradation review. Nondegradation review is a critical aspect of WQSs for protecting high quality waters and existing designated uses. The outcome of this review informs the effluent limit setting process as well as the facility design process, NPDES permit approval, and future effluent limit requirements. MPCA nondegradation provisions are listed in Minn. R. 7050.0180, 7050.0185, and 7052.0300 to 7052.0330.

Development of effluent limits¹¹: Effluent limits are classified as either technology based or water quality based. In accordance with the CWA, effluent limit reviewers must first determine whether technology based effluent limits (TBELs) exist for a unique facility and whether the TBELs are protective of the designated uses. TBELs implement state and federal minimum treatment capabilities, such as requiring advanced secondary treatment. Minnesota Rules include a one mg/L limit for phosphorus applied to many facilities; rules also specify the process to determine the appropriate TBELs for industrial discharges (Minn. R. 7053.0215 to 7053.0225). The EPA has developed industrial effluent limit guidelines (ELGs) for about 50 specific industries from paper manufacturers to food processors. Minnesota's TBELs in Minn. R. 7053 and the EPA's ELGs are based on an analysis of best achievable technology categories, with the goal being to reduce pollutant concentrations associated with a specific industrial process.

In order to determine whether TBELs are protective of the unique receiving water and designated uses the effluent limit reviewer must determine whether a given discharge has a "reasonable potential to cause, or contribute" to an excursion of a WQS in ambient waters (40 CFR § 122.44[d]). The reasonable potential determination must be done for each pollutant present in the discharge for which there is a narrative or numeric WQSs and results in application of either a TBEL or development of water quality based effluent limit (WQBELs). WQBELs are numeric concentrations that convert WQSs to "end-of-pipe" limits. Developing a WQBEL includes consideration of receiving water flow and characteristics, averaging times, conventional pollutants versus toxics, and special use classifications (e.g., Lake Superior Basin and outstanding resource value waters). If TMDL WLAs are available for a specific discharge the WLA can be applied as, or translated to, a WQBEL.

There are multiple components to determining that the effluent limits are protecting water quality and the designated beneficial uses, including monitoring requirements and Whole Effluent Toxicity (WET) tests. Effluent limit scientists determine when these tests are needed and evaluate the results.

¹¹ **CPP Element 1:** A process for developing effluent limitations and schedules of compliance at least as stringent as those required by sections 301(b)(1) and (2), 306 and 307, and at least as stringent as any requirements contained in applicable water quality standards in effect under the authority of section 303 of the Clean Water Act (CWA). **CPP Element 3:** Process for developing Total Maximum Daily Loads (TMDLs) and individual water-quality based effluent limitations for pollutants in accordance with section 303(d) of the CWA and section 40 CFR § 130.7(a).

The outcomes of an effluent limit review may include:

- development of permit-specific effluent limits
- incorporation of general guidance and implementation and criteria into the MPCA Permit Writer's Manual
- oversight and technical support for variance reviews and processes
- coordination with WQSs and EPA on site-specific criteria and modified standards

Technical review

The technical review and approval process of wastewater treatment facilities (WWTF) provides the public with reasonable assurance that proposed WWTF projects will comply with applicable permits and rules, meet reliability criterion and comply with recognized engineering design practice.

The Municipal and Industrial Division engineers perform five major roles in the water program.

1. They are the permit writer for complex NPDES and/or SDS permits.
2. They provide technical support to the water program permit writers.
3. They provide technical support/assistance to the compliance staff in resolving noncompliance situations.
4. They review and approve engineering reports and plans and specifications for the purposes of providing reasonable assurance that the treatment works will meet water quality standards.
5. They are project managers for Public Facilities Authority (PFA) and Rural Development wastewater treatment projects.

Permit monitoring requirements

The permittee is required in the NPDES/SDS permit to monitor the treatment system and submit Discharge Monitoring Reports (DMR) to the MPCA. The MPCA is developing an electronic DMR submittal system to make reporting and use of the data more efficient. Other parameters which municipal permittees are frequently required to monitor include phosphorus and ammonia nitrogen.

Data management

The Data Analysis Unit serves the Point Source Program in the Industrial and Municipal Divisions. Staff employs advanced data analysis and GIS methods to evaluate compliance and environmental impacts for point source discharges, particularly impacts to impaired waters. The roles of this unit are to:

- Ensure that the data entered into DELTA are accurate, complete and timely.
- Develop and refine standards for ongoing data management and QA/QC.
- Provide timely, accurate and knowledgeable data management and interpretation assistance to program staff, database management staff, regulated facilities and their authorized agents.

Compliance and enforcement

Point source wastewater staff provides compliance and enforcement for both municipal and industrial wastewater facilities and their role is to ensure that these facilities are following permit and rule requirements. Reviews are typically conducted through a variety of site inspection methods and can include: a full facility review, a sampling inspection, pretreatment inspections, complaints, data reviews, and/or a combination of inspection types. A permit is often the main compliance document for both the regulated party and the MPCA. The regulated party benefits from knowing exactly how the MPCA defines the parameters of the activity being permitted, and the MPCA benefits by knowing how the regulated party is required to track and report its compliance status.

Other wastewater activities

There are many other activities that fall into the wastewater program, as briefly described below:

Wastewater operator certification and training: The primary purpose of the mandatory wastewater operator certification program is to ensure that the individuals who are responsible for the operation of Minnesota's municipal wastewater treatment facilities have demonstrated, by passing a written examination, that they have the knowledge necessary to properly operate a wastewater treatment facility. Properly operated wastewater treatment facilities are important for the protection of public health. Wastewater treatment facilities protect the public health by collecting and treating human waste and disposing of it safely. Wastewater operator certification include providing wastewater conferences and seminars, various course and workshop offerings, on-site technical assistance visits, responding to operation questions and requests for information, administering exams, maintaining the operator certification database and responding to operator certification needs. The municipal NPDES/SDS permit also requires that the permittee employ a certified operator to operate the treatment facility. The certification level required for the operator will depend on the complexity of the facility's operation. Proof that a certified operator is on board must be submitted to the MPCA.

Pretreatment program: The pretreatment program deals with industrial users of publicly owned treatment works (POTWs). The main pretreatment objective is to administer categorical pretreatment limits and to develop user agreements to prevent interference or pass-through at POTWs. Interference and pass-through are both defined in terms of violations of effluent limits water quality standards. All POTWs are responsible to control their Industrial Users (IUs) to prevent interference and pass-through. POTWs that do not have formally delegated pretreatment programs must notify the MPCA of any Significant Industrial User (SIU) within 30 days of identifying the IU as significant.

POTWs that have a design flow at or above five million gallons/day are also required to be delegated to administer categorical pretreatment limits. A delegated POTW pretreatment program requires substantial program development and a formal delegation process. There are currently nine delegated POTWs in Minnesota. All POTWs are responsible to control IUs to prevent interference and pass-through, and to

Compliance and enforcement

MPCA compliance and enforcement activities oversee water quality permit programs, feedlots, stormwater and wastewater to ensure these facilities are following permit and rule requirements. Reviews are typically conducted through a variety of site inspection methods and can include: a full facility review, a sampling inspection, pretreatment inspections, complaints and data reviews. Compliance reviews attempt to inspect a cross section of many different types of facilities throughout the MPCA's water program. The MPCA and EPA negotiate and coordinate water quality compliance and enforcement to ensure overall compliance and are part of the MPCA's Compliance Monitoring Strategy (CMS) which is documented in the MPCA EnPPA. The enforcement response plan (ERP) describes what tools MPCA water compliance staff can utilize as they return facilities back to compliance, and contains elements on determining compliance, what enforcement mechanisms are available and the use of penalties.

A permit is often the main compliance document for both for the regulated party and the MPCA. The regulated party benefits from knowing exactly how the MPCA defines the parameters of the activity being permitted and how the regulated party is required to track and report its compliance status to the MPCA. Compliance reviews help to provide the consistency of the agency permit requirements.

The MPCA uses enforcement actions to resolve noncompliance, including penalties. Oftentimes, compliance schedules are used in enforcement actions and these schedules can be integrated into permits. The schedule can allow a period of time during which the regulated party is required to take certain steps to return to compliance.

control SIUs. Delegated POTWs are also responsible to issue pretreatment permits and enforce national categorical pretreatment standards for IUs in their systems. Elsewhere MPCA enforces national categorical pretreatment standards through the use of MPCA issued pretreatment permits issued directly to the industry.

Biosolids and land application programs¹²: Biosolids are the nutrient-rich organic materials resulting from the treatment of sewage sludge (the name for the solid, semisolid or liquid untreated residue generated during the treatment of domestic sewage in a treatment facility). Facilities that generate biosolids have requirements incorporated in their NPDES permit. When treated and processed biosolids can be safely recycled and applied as fertilizer to sustainably improve and maintain productive soils and stimulate plant growth. This program component insures that human health risks are eliminated by assuring biosolids applications provide vector attraction reduction, pathogens reduction and minimized risks of groundwater and surface water contamination. The same is true for industrial by-products which are land applied via permit. In Minnesota, approximately 30 percent of the biosolids (dry tons) are land applied. The remaining is incinerated (54 percent in 2009) or landfilled (16 percent in 2009). Biosolids rules are found in Minn. R. ch. 7041. Information on land application of industrial by-products is found on this website: www.pca.state.mn.us/index.php/waste/waste-and-cleanup/cleanup-programs-and-topics/topics/land-application-of-industrial-by-products.html?menuid=&missing=0&redirect=1.

Subsurface Sewage Treatment System (SSTS) program: Commonly known as septic systems, SSTSs are regulated by Minn. Stat. §§ 115.55 and 115.56. These regulations detail:

- Minimum technical standards for individual and mid-size SSTS (Chapters 7080 and 7081).
- A framework for local administration of SSTS programs (Chapter 7082).
- Statewide licensing and certification of SSTS professionals, SSTS product review and registration, and establishment of the SSTS Advisory Committee (Chapter 7083).

The goal of the SSTS program is to protect the public health and the environment through adequate treatment and dispersal of domestic sewage from dwellings or other establishments generating volumes less than 10,000 gallons per day. The MPCA accomplishes these goals by making periodic revisions to Minnesota's SSTS code, providing ongoing assistance in interpreting Minnesota's SSTS code; and administering the statewide SSTS certification and licensing program. SSTS requirements are adopted and enforced locally. Requests for assistance are directed to the local unit of government.

Implementation of unsewered strategy: The activity addresses the needs of high priority unsewered (also referred to as small community needs) and under-sewered areas. An "unsewered" area is where no treatment of sewage occurs (i.e., straight pipes) and an "under-sewered" area is defined as an area where treatment is spotty or problematic. Areas served by compliant SSTS are considered "sewered."

Small communities face special challenges in finding solutions to wastewater treatment problems. In an effort to better understand the needs of these communities and find proactive ways to meet those needs, the MPCA has developed a Small Community Wastewater Strategy:

www.pca.state.mn.us/index.php/water/water-types-and-programs/wastewater/wastewater.html.

The main goal in this strategy is to eliminate straight pipe discharge of raw or partially settled sewage into surface waters or onto the land surface by December 31, 2014. The first step toward achieving this goal is to prioritize finding solutions for the following types of small communities:

- communities with a common straight pipe discharging to surface waters in both incorporated and unincorporated areas,
- communities with individual straight pipes discharging to surface waters or to the ground surface
- lake communities with some type of subsurface system, but containing poor soil conditions and lots too small for placement of effective individual onsite sewage-treatment systems

¹² **CPP Element 7:** A process for assuring adequate controls over the disposition of all residual waste from any water treatment processing.

- prioritization will also consider impaired waters, receiving environments, volume and strength of wastewater and local priorities

Current and future improvement activities and integration with the watershed approach

As the MPCA moves through the state's watersheds, the MPCA is investigating whether it is possible that wastewater permitting could shift to a watershed schedule.¹³ However, the following are critical factors that need to be considered as part of the investigation:

- five year permit terms
- compliance schedules
- commitments to EPA and other stakeholders
- applications received in the interim five years for new/expanded dischargers

Another consideration is the agency's commitment to EPA under the EnPPA to issue permits in a timely fashion. Priority permits must be issued within 180 days of receipt of permit applications. Priority permits include those that will expire in less than 10 years, permits that are expired or expiring in the current federal fiscal year and that must be modified to address waste load allocations from an approved TMDL and permits that are expired for less than 2 years are listed, but may be exempted for specific reasons.

All permits that meet the above criteria are listed and states commit to reissuing a certain number of those permits, but do not commit to reissuing specific permits. EPA asks states to commit to reissuing 20 percent of their lists.

A shift toward watershed permits may result in changes to the permit reissuance schedule and may also result in an increase to the permit backlog¹⁴.

Other new activities include recent effluent limit program development accomplishments (from 2003 to 2011):

- Issuance of the Minnesota River Basin Phosphorus General Permit (2005): The permit addressed cumulative point source phosphorus loading (www.pca.state.mn.us/water/basins/mnriver/mnriver-phosphoruspermit.html).
- Completion of the Mercury Implementation Strategy (2009): Final implementation step for statewide mercury TMDL (www.pca.state.mn.us/publications/wq-wwprm1-16.pdf).
- Improving Phosphorus Control: New promulgated ELs (2008) and future implementation of new Eutrophication WQS for rivers part of 2011 Triennial Water Quality Standards Revisions (see Water Quality Standards Section).
- New tools to reduce nitrate (2010): New 2010 Impaired Waters 303(d) Listings, new effluent monitoring requirements, and future promulgation of statewide nitrate WQSs for aquatic life (2011).
- Watershed permitting pilots (Sauk River and Root River).

Three new permitting programs have been developed (or are under development):

Pesticide NPDES Permit Program: The U.S. Environmental Protection Agency (EPA) is developing a Pesticide General Permit (PGP) per the courts recommendation that a Clean Water Act (CWA) National Pollutant Discharge Elimination System (NPDES) permit is necessary for the application of pesticides to, over or near waters of the United States. MPCA has been tracking this federal permit, and will be required to have an NPDES permit in place by April 9, 2011.

The Federal PGP intends to cover the following four categories of activities; MPCA's permit will follow suit:

¹³ **CPP Element 2:** A process for incorporating elements of any applicable area-wide waste treatment plans under section 208, and applicable basin plans under section 209 of the CWA.

¹⁴ **CPP Element 9:** A process for determining the priority of permit issuance.

- mosquito control
- control of aquatic weeds and algae
- area-wide pest control programs, such as gypsy moth and grasshopper control, often done over large areas and diverse habitats and requiring aerial application
- control of aquatic nuisance animals, like zebra mussels and Asian carp

Ballast water permitting: The MPCA issued a ballast water discharge general permit on September 24, 2008, covering the ballast water discharges of commercial vessels that transit the Minnesota waters of Lake Superior. The permit covers both seagoing and Great Lakes-only vessels. The Great Lakes water transportation industry is vitally important to Minnesota's economy. However, ballast water discharges from oceangoing and Great Lakes-only ("laker") vessels may contain aquatic invasive species. Aquatic invasive species compete with native species for food and habitat, alter aquatic ecosystems, and cause significant economic impact. The MPCA, working with other state, federal, tribal and international organizations, is taking steps to address this threat and intends to develop a regulatory program to control the introduction and spread of invasive species by ballast water.

Pre-TMDL trading development: The MPCA's initial attempts at Pre-TMDL trading met mixed reactions and reached the docket of the Minnesota Supreme Court in 2006. In a ruling released in May 2007, the court agreed with the MPCA's interpretation of the Clean Water Act and upheld a wastewater treatment facility permit issued to the cities of Annandale and Maple Lake. The court acknowledged that the MPCA made a "reasonable interpretation" of the law by allowing a reduction in phosphorus discharge at one facility to make up for an increase at the proposed Annandale-Maple Lake facility. The ruling provided significant guidance to the MPCA in developing Pre-TMDL Trading.

In September 2007, Pre-TMDL phosphorus trading was brought forward to the MPCA Citizens' Board as an informational item. Comments received were taken into account during the development of PTPT and the Draft Water Quality Trading Rules (currently under development). The Board approved Pre-TMDL Phosphorus Trading on June 24, 2008. For more information, see the following documents or webpage:

- Pre-TMDL Phosphorus Trading Permitting Strategy Board Item:
www.pca.state.mn.us/index.php?option=com_docman&task=doc_download&gid=8251&Itemid= Approval of Pre-TMDL Phosphorus Trading. Phosphorus trading as an interim permitting strategy for new or expanding wastewater treatment facilities discharging upstream of an EPA approved 303(d) listed nutrient (phosphorus) impaired water.
- Pre-TMDL Phosphorus Trading Permitting Strategy - Final Signature Document, June 27, 2008:
www.pca.state.mn.us/index.php?option=com_docman&task=doc_download&gid=10762&Itemid=
- Minnesota River Trading: www.pca.state.mn.us/index.php/water/water-types-and-programs/surface-water/basins-and-watersheds/minnesota-river-basin/minnesota-river-basin-general-phosphorus-permit-phase-1.html?menuid=&missing=0&redirect=1.

Internal and external partners

The wastewater point source program includes many program components that work together on a daily basis. The lead manager for the permitting program is the Municipal Wastewater Section Manager. The lead Division Directors are in the Municipal, Industrial, and EAO divisions.

Staff in the water quality point source program issue permits, monitor compliance with permits and water quality rules through data review and inspections, enforce the conditions of the permits and rules, review plans and specs, manage data, train operators, develop policy, review and set effluent limits, complete nondegradation reviews, set standards, provide environmental review, participate in TMDL development, coordinate wastewater financing programs, provide customer assistance, coordinate with the EPA and manage land application and biosolids and industrial by-product issues.

Hydrologists provide soils and hydro-geologic support for permitting new, expanding or existing wastewater systems that utilize a soil treatment and disposal unit as part of the system.

Staff conducting this work are located in Environmental Analysis and Outcomes Division (EAO), Industrial Division, Prevention and Assistance Division, Regional Division, and Municipal Division.

The partners MPCA works with to ensure that wastewater goals are met include municipal wastewater and water treatment facilities, industrial facilities that have a discharge from their facility process or wastewater treatment facility, industrial stormwater facilities, local units of government, EPA, other funding agencies and pumpers, installers, and inspectors of ISTS systems.

Stormwater

Stormwater activities consist of three stormwater regulatory program components; municipal separate storm sewer systems (MS4s), construction, and industrial; and the MPCA's efforts to promote green stormwater infrastructure (GSI) and low impact development (LID). The overall goal is to reduce or eliminate the environmental damage caused by stormwater runoff from MS4s, construction activity, and industrial facilities. The GSI program area works to achieve stormwater pollution prevention through conservation design and land use planning.

Stormwater program area activities include technical assistance; development of rules, permits, and policy; permitting; inspections and audits; compliance and enforcement; technical review; training, research and assessment, environmental review; participation in watershed strategy development and TMDLs; data management; and financial assistance. These activities are integrated with the MPCA's other water program work into several agency-wide plans which include the MPCA Strategic Plan, EnPPA and the Water Quality Integrated Report.

The MPCA's Stormwater webpage is available at: www.pca.state.mn.us/water/stormwater/index.html.

Regulatory authority

Section 402 of the Federal Clean Water Act (CWA) established the National Pollutant Discharge Elimination System (NPDES) permit program to specifically control the discharge of pollutants from point source dischargers to waters of the United States. A 1987 amendment to the CWA required stormwater discharges from municipal, construction, and industrial sources to be permitted under the NPDES permit program. The amendment was to be implemented in two phases: Phase I in the early 1990s and Phase II in March 2003.

The Phase I federal regulations required NPDES permits for two broad categories of stormwater discharges: 1) medium and large MS4s serving populations of 100,000 or more, and 2) eleven categories of industrial activity, including larger construction activities disturbing five or more acres of land. The Phase II federal regulations expanded the scope of the existing NPDES permitting program to include discharges of stormwater from smaller MS4s in urbanized areas, from construction activities that disturb between one and five acres, and from smaller municipally owned industrial activities.

The MPCA is authorized by the EPA to implement the stormwater regulatory program in Minnesota. The MPCA issues general and individual NPDES permits for each program area; municipal, construction, and industrial. At minimum, the state stormwater permits must be as stringent as the federal regulations. These permits require permittees to control discharges of polluted stormwater runoff by implementing, inspecting, and maintaining best management practices (BMPs), which are incorporated in the permittees' Stormwater Pollution Prevention Program or Plan (SWPPP). The permit term for both general and individual permits is five years.

Permit effluent limits are developed in accordance with state and federal regulations. Of the three stormwater general permits and two municipal stormwater individual permits, currently only the industrial stormwater multi-sector general permit contains effluent limit guidelines. The effluent monitoring requirements of the permit are required by federal regulation for certain activities, and for only 8 of the 29 sectors regulated under the permit. When the next construction stormwater general permit is reissued, the MPCA will need to comply

with the new federal regulations on *Effluent Guidelines for Discharges from Construction and Development Sites*: www.epa.gov/waterscience/guide/construction/.¹⁵

Development of stormwater general permits is an arduous and lengthy process that involves coordination between the three stormwater regulatory programs, the impaired waters program, and the pollution prevention program; obtaining stakeholder participation and input; internal and external (including EPA) review of the draft permit; providing public notice and opportunity for review and comment on draft permits; responding to public comments and hearing requests; and bringing the permit to the MPCA Citizens' Board for approval. The timeline for development and issuance of a stormwater general permit ranges from two to five years.

Stormwater permits and SWPPPs

Municipal stormwater

The Phase I NPDES/SDS municipal stormwater individual permits were issued to the cities of Minneapolis and Saint Paul to regulate the discharges of stormwater associated with these municipal storm sewer systems. Work is currently underway to reissue these existing expired permits. The draft permits were placed on public notice April 2010. The permits will require the permittee to develop, implement, and enforce a stormwater management program that, if properly designed and implemented, reduces the discharge of pollutants to the maximum extent practicable, protects water quality, and satisfies the appropriate water quality requirements of the Clean Water Act. These individual permits will also require tracking of work for many of the same MS4 general permit issues as the small MS4s; however, these permits include monitoring.

In implementing the Phase II requirements, the MPCA was directed by the Minnesota Court of Appeals to address Minnesota anti-degradation rules stemming from federal anti-degradation policy (40 CFR § 131.12), and to conduct review and provide opportunity for public comment and hearing on each permittee's individual SWPPPs in a general permit setting. The original Phase II small MS4 general permit (issued in 2002) was revised to meet the court remanded issues and became effective June 2006. Work is underway to reissue the existing MS4 general permit which will expire in May 2011. The general permit requires permittees to develop, implement, and enforce a SWPPP that includes BMPs for six minimum control measures that are set forth in federal regulations. The requirement to conduct review and public notice of all individual SWPPPs and applications under the MS4 general permit is, in effect, similar to issuing individual permits to all general permit applicants.

Construction stormwater

The Phase I NPDES/SDS general permit regulating larger construction activities disturbing five or more acres of land was issued in 1993 and reissued in 1998. In August 2003, the MPCA issued a revised construction stormwater general permit for construction activity over one acre of disturbance, incorporating both the Phase I and Phase II regulations for stormwater discharges associated with construction activity. In August 2008, the MPCA reissued the construction stormwater general permit with revisions that included new requirements for impaired waters covered by an EPA approved TMDL, revised requirements for change of permit coverage, and training.

The general permit provides coverage for all construction activity including clearing, grading and excavation, which disturb land of equal to or greater than one acre, including construction that is part of a common plan of development or sale disturbing one acre or more. The general permit requires permittees to develop and implement a SWPPP prior to construction activity to address the potential for discharge of sediment and/or other potential pollutants from the construction site. The general permit also includes requirements for a permanent stormwater management system; specifically, when a project replaces vegetation or other pervious surfaces with one or more acres of cumulative impervious surface, one-half of runoff from the new impervious surface must be treated by specific methods identified in the permit. The SWPPP must be completed prior to

¹⁵ **CPP Element 1:** A process for developing effluent limitations and schedules of compliance at least as stringent as those required by sections 301(b)(1) and (2), 306 and 307, and at least as stringent as any requirements contained in applicable water quality standards in effect under the authority of section 303 of the Clean Water Act (CWA).

application submittal. Staff conduct review of SWPPPs for projects that disturb 50 acres or greater and that have a discharge point on the project that is within one mile of and flows to a special water requiring additional protections or waters listed as impaired. With the current economic downturn, fewer larger construction projects are occurring, resulting in audits of more small sites.

The MPCA plans to reissue the existing permit with revisions before expiration in August 2013. The MPCA will need to comply with the EPA final rule on *Effluent Guidelines for Discharges from Construction and Development Sites* (www.epa.gov/waterscience/guide/construction/) (December 2009) with the next permit reissuance.

Industrial stormwater

The Phase I NPDES/SDS industrial stormwater general permit regulating ten categories of industrial activity was first issued in September 1992, and last expired in October 2002. With the need to address many issues regarding Phase II implementation, staff resources needed for other Phase II permit efforts and rule development, and pending completion of EPA's Industrial Multi-Sector General Permit; the MPCA put work on reissuance of the industrial stormwater general permit on hold.

In fall 2006, an industrial work group was formed to work with the MPCA to develop Minnesota's industrial stormwater multi-sector general permit and permit program using EPA's 2008 multi-sector general permit as a model. The new industrial stormwater multi-sector general permit became effective in April 2010.

The general permit requires permittees to develop, implement, and maintain a SWPPP that includes the type and objective of the BMP used for each of the stormwater control measures identified in the permit. The SWPPP must be completed prior to application submittal. The permit also requires permittees to conduct benchmark monitoring required for all sectors and effluent limit monitoring required for eight of the 29 covered sectors of industry. The purpose of benchmark monitoring is to guide adaptive management of stormwater discharge control measures; effluent limit monitoring to document compliance status with effluent limits. With implementation of the new industrial stormwater multi-sector general permit, staff will conduct review of SWPPPs as part of the facility inspection process.

Stormwater permit prioritization¹⁶

Currently, permit prioritization, as well as prioritization of permit related activities (e.g., review, audits, compliance and enforcement) generally occurs between the three program areas (municipal, construction, and industrial), with prioritization more limited within each program area. In the future, prioritizing activities will be based on a watershed approach (e.g., prioritized review, audits, etc. of municipal stormwater management programs that must address impaired waters and TMDL requirements for waste load allocations).

As stated previously, with the need to address Phase II implementation, staff resources were needed for multiple Phase II permit efforts and rule development. Determining priority of development and issuance of the three general permits depends on several factors including; permit expiration date, staff resources, and other competing stormwater priorities. Currently, the expiration date of the three general permits is somewhat staggered which aids in sharing of staff resources between the various permit efforts.

Generally, issuance of the construction stormwater general permit has been given the highest priority. This is due in large part to expiration of this permit potentially hindering economic development; a construction stormwater permit is needed for development and redevelopment projects, and linear projects such as roadways.

MS4 general permit

The Minnesota Court of Appeals ruling on the MS4 general permit directed the MPCA to provide public notice and opportunity for hearing on the individual proposed SWPPPs, and preliminary determination on permit coverage. Owners and operators of regulated small MS4s seeking coverage under the MS4 general permit are required to submit a complete permit application that includes a proposed SWPPP. Currently, no

¹⁶ **CPP Element 9:** A process for determining the priority of permit issuance.

need exists for a process for determining priority of issuing permit coverage. All regulated MS4s are required to submit a permit application by the date specified in the MS4 general permit. Review of applications and SWPPPs, and subsequent public notice of these documents is done by geographic area when possible, in part to accommodate municipalities that work cooperatively on stormwater management and implementing elements of their SWPPPs. The MPCA's final decision to issue permit coverage is based on staff review of the application and SWPPP, public notice of the application and SWPPP, comments received during the public notice period are addressed, and a determination has been made by the MPCA that the SWPPP is adequate.

Construction stormwater general permit

Currently, no need exists for a process for determining priority of permit coverage for the construction stormwater general permit. Permit applications are processed as they are submitted to the Agency and permit coverage is issued within two or seven calendar days, dependent on method of application submittal (i.e. online or hard copy). For certain larger projects disturbing 50 acres or more, permit coverage is issued within 30 days.

Industrial stormwater multi-sector general permit

The process for determining priority of permit coverage for the industrial stormwater multi-sector general permit is based on several factors. Staff considered the environmental risk of pollutants (i.e. pollutant level of risk is high, moderate, low), the number of facilities within the 29 covered sectors of industry, load of pollutants, and rate of compliance to come up with a total risk factor. Sectors were then divided into three phased application groups based on total risk factor. Facilities seeking coverage under the industrial stormwater multi-sector general permit are required to submit an application in accordance with the schedule for their sector as identified in the permit.

Stormwater permits and impaired waters

Stormwater is linked to the impaired waters program through TMDL requirements. Federal regulations require NPDES permits to be in compliance with TMDL waste load allocations (WLA). All stormwater covered under a NPDES permit is included in the point source loading or WLA in the TMDL. The WLA includes all permitted stormwater, permitted feedlots, and permitted municipal wastewater. When stormwater contributes significant pollutant loads to impaired waters, the three components of stormwater permitting--municipal, construction, and industrial--must be addressed separately in a TMDL so that the responsibilities of each are clear.

Stormwater TMDL implementation is an ongoing process that requires continued coordination between the Stormwater Program and the impaired waters/TMDL program housed in the Regional Division. The stormwater/TMDL liaison (Municipal Stormwater Unit, Municipal Division) works to continue integration of the three stormwater permit programs impacted by TMDL studies, with the greatest focus on municipal stormwater; and coordinates with Regional Division staff to provide review and comment on draft TMDLs and implementation plans with a stormwater component. The stormwater/TMDL liaison also works with staff in the Environmental Analysis and Outcomes Division; providing information and feedback from a stormwater perspective regarding water assessment and impaired waters listings. In the future, more exploration is needed on how stormwater integrates with other programs and prioritizing of activities such as TMDL implementation, and integration between programs (e.g., stormwater and wastewater).

Policy, guidance, and training materials designed to assist stormwater permittees, TMDL writers, and others working on stormwater/TMDL issues are available on the Stormwater Program and Impaired Waters website at: www.pca.state.mn.us/water/stormwater/impairedwaters.html.

Compliance and enforcement

The permit and the Stormwater Pollution Prevention Plan or Program (SWPPP) are the main compliance plans both for the regulated party and the MPCA. Regulated parties are responsible for developing, implementing, and maintaining their SWPPP. The permit requires the regulated party to track and report its compliance status to the MPCA. For all three program areas, this is done through a combination of schedules, reports, and

monitoring identified in the permits and SWPPPs. For industrial and municipal permittees, this includes submittal of an annual report; industrial and Phase I municipal permittees are also required to submit monitoring reports.

For municipal stormwater, the annual reports are also used as part of the audit process. The audit process is an opportunity to provide tailored guidance and technical assistance to permittees, and facilitate adaptive management for stormwater systems at the same time as evaluating compliance with rules, TMDLs, and the permit conditions. For construction stormwater, SWPPPs for projects greater than 50 acres discharging to identified special or listed impaired waters are reviewed or audited. These reviews and audits identify types of BMPs, projects, and permittees where problems are occurring; and develop outreach strategies/training content changes. The construction stormwater program area follows up on complaints, conducts inspections, and the compliance and enforcement process, and provides compliance assistance. With recent issuance of the industrial stormwater multi-sector general permit (April 2010); the industrial stormwater program area will focus on both the permit and program development, and the implementation of a compliance review program.

Current and future improvement activities

One of the key identified priorities and goals for the stormwater program area is to develop and implement the MPCA's watershed approach. As resources allow, the stormwater program area will work to identify how it participates in impaired waters activities, and how stormwater requirements and implementation approaches should be conducted differently if needed to support the three stages of the MPCA's watershed protection approach. Current and future program area efforts that relate to watershed management include:

- Exploring a watershed permit pilot project being advanced by EPA in response to the 2008 National Research Council Report on Urban Stormwater Management.
- Participation in the Minnesota Stormwater Steering Committee (SSC) Roadmap priority efforts for watershed-based statewide stormwater management and improving the efficiency of stormwater planning and processes.
- Developing policies, procedures, and guidance for TMDL and stormwater alignment.
- Developing Minimal Impact Design Standards or MIDS (i.e. performance standards, design standards, or other tools to enable and promote the implementation of LID, and other stormwater management techniques).

Other stormwater program area efforts that relate to watershed management include:

- Developing policies, procedures, and guidance for compliance with non-degradation and other permit requirements.
- Assisting with the non-degradation rulemaking effort.
- Conducting non-degradation determinations for Phase II municipal stormwater permits.
- Looking for additional opportunities to incorporate watershed management into stormwater permits, permit implementation, and special projects (as resources allow).

Additional activities were mandated in 2009 Legislation regarding coal tar-based asphalt sealants and PAH in stormwater ponds, inventory, and BMPs for treatment. The legislation directs the MPCA to study its environmental effects and develop management guidelines. Current and future program efforts to address requirements for PAH-contaminated stormwater pond sediments include development of a model ordinance for LGUs, provide grants to LGUs to implement best management practices (BMPs) to treat or clean-up contaminated sediments in stormwater ponds and other waters, and provide recommendations regarding coal tar product restrictions/bans.

Internal and external partners

The stormwater program area is an evolving program with ever increasing involvement with other Agency programs areas. It must also manage increased EPA attention to stormwater, resulting in large part from the 2008 National Research Council Report on Urban Stormwater Management in the United States:

www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf. This includes efforts to help shape or respond to stormwater program changes from EPA, such as EPA's currently proposed NPDES rulemaking to strengthen the stormwater program area.

Staff who conduct stormwater activities are located in the Municipal Division, Industrial Division, and Prevention and Assistance Division. The Stormwater Section, Municipal Division, conducts program development and coordination of the MPCA's stormwater program area; and carries out the Agency's municipal and construction stormwater regulatory responsibilities. The Industrial Division conducts activities related to implementation of the industrial stormwater requirements, including industrial stormwater general permit and program development, and compliance and enforcement of permitted industrial stormwater sites.

Staff in the Municipal Division also conducts activities related to stormwater management through GSI and LID. This work is primarily integrated into the municipal stormwater program area to achieve stormwater pollution prevention (P2) through innovative stormwater practices, conservation design, and land use planning. Pollution prevention is integrated into the work of the three stormwater program areas in order that the MPCA's work systematically balances prevention, management (i.e. stormwater BMPs), and remediation. Pollution prevention and technical assistance is provided by staff in the Prevention and Assistance Division (PAD).

Staff in the Stormwater Policy and Technical Assistance Unit, Municipal Division, conduct activities related to building and refining the foundational elements of the stormwater program area including; policy and program development, coordination with EPA, permit development (primary for construction stormwater permit program area providing overall coordination, planning, and technical assistance), rule development, program planning and Agency strategic planning/measures, data management, monitoring and research, and SSC and advisory group representation. The unit also provides overall coordination and planning, and technical assistance on MS4 general permit development; and assists with permit development and provides technical assistance on the industrial stormwater general permit.

Staff in the Municipal Stormwater Unit, Municipal Division, conducts activities related to implementation of the MS4 program area including; permitting, SWPPP and annual report review, audits, compliance and enforcement, TMDL compliance and education/outreach, and providing assistance to LGUs and communities on stormwater management through GSI and LID. The unit is the lead for the municipal stormwater permit program area and is the lead for development of the MS4 general permit, and the two municipal stormwater individual permits.

Staff in the Construction Stormwater Compliance and Enforcement Unit conduct activities related to compliance and enforcement of permitted construction stormwater sites including; site inspections and follow-up actions, technical assistance (e.g., on the construction stormwater permit, BMPs, stormwater management, water quality rules), and training.

Staff in the Water Quality Compliance and Enforcement Unit, Industrial Division, conduct activities related to the implementation of the industrial stormwater program area, and compliance and enforcement of permitted industrial stormwater sites including: industrial stormwater general permit and program development, site inspections and follow-up actions, technical assistance (e.g., on the industrial stormwater permit, BMPs, monitoring, stormwater management, water quality rules...), and training. The unit has been the lead for the industrial stormwater permit and lead for the industrial general permit development effort. However, industrial stormwater permit program implementation work is currently transitioning to another Industrial Division unit, allowing the WQ Compliance and Enforcement Unit to focus on completion and implementation of the compliance and enforcement strategy for industrial stormwater.

In general, the individuals or facilities MPCA staff works with include: owners/operators of MS4s; local units of government; developers, builders, transportation departments, and others conducting construction activity; facilities that discharge stormwater associated with industrial activity, and consultants.

In Minnesota, there are approximately 24,000 registered feedlots, ranging in size from small farms to large-scale commercial livestock operations. Agriculture, including livestock, comprises a major portion of the state's economy. Many organizations and programs work with livestock producers to ensure that we continue to have a healthy livestock industry and a healthy natural environment.

1. Ensuring that manure on a feedlot or manure storage area does not run into surface water or seep into groundwater.
2. Ensuring that nutrient-rich manure is applied to cropland at a rate, time and method that prevents nutrients and other possible contaminants from entering streams, lakes and groundwater.

- construction specifications that ensure the feedlot will properly contain the manure
- manure management plans for many medium and all large-sized feedlots
- requirements for the amount and placement of nutrients spread on fields
- management of animal mortalities
- emergency response planning

Delegated county feedlot program

Delegated counties receive state grants to help fund their programs. Funds are awarded based on the number of feedlots in the county with more than 50 AU (10 in shoreland) and the level of inspections completed. In recent years, annual grants statewide have totaled more than \$2 million.

Figure 10: County delegated feedlot program (green delegated, blue non-delegated)



2000 feedlot rule revision

In October 2000, a major revision of the feedlot rule (Minn. R. ch. 7020) went into effect. The main goals for the feedlot rule were:

- Register all feedlots capable of holding 50 or more animal units (10 in shoreland areas).
- Focus on animal feedlots and manure storage areas that have the greatest potential for environmental impact.
- Expand the role of delegated counties.
- Increase agency and delegated-county staff field presence.

The above goals have been met. In addition to maintaining registration, county program oversight, permitting, and construction oversight, emphases in recent years have been to ensure zero discharge at all Confined Animal Feeding Operations (CAFOs); ensure land application of manure rates and setbacks are met; and fixing open lot runoff problems. The feedlot rule does not specifically regulate pasture operations; however, they still must abide by Minnesota Rules chapter 7050 & 7060 prohibiting pollution of state waters. Typical examples include beef grazing and cow/calf operations.

Feedlot permits

Under Minnesota's environmental review rules (Minn. R. 4410.4300, subp. 29) an Environmental Assessment Worksheet is mandatory for the construction of a feedlot facility with the capacity to house 1,000 or more animal units, or 500 animal units if the facility is wholly or partially located in certain sensitive locations such as shoreland, flood plain, state or federally designated wild and scenic river district, the Minnesota River Project River bend area, the Mississippi headwaters area, or an area within a drinking water supply management area vulnerable to contamination. If a project triggers the EAW process, a 30-day comment period is provided. The public notice for the proposed permit is conducted concurrently. No permits can be issued until completion of the mandatory environmental review.

The revised feedlot rule eliminated the need for most smaller-sized feedlots to have permits. Most large feedlots operate with state and federal permits. The National Pollutant Discharge Elimination System (NPDES) permit and the State Disposal System (SDS) permit require specific conditions to comply with state law and the federal Clean Water Act. Of the approximately 1,200 feedlots currently operating with NPDES permits, about 1,160 have general permits and about 40 have individual permits. A general permit is a single document that can apply to all livestock facilities whose operations are similar. The feedlot general NPDES permit also includes stormwater requirements, so that a feedlot obtaining an NPDES feedlot permit does not need to obtain a separate NPDES stormwater permit.

The MPCA or delegated counties also issue permits for feedlot construction, and interim permits allowing feedlots with pollution problems to operate in a two-year period during which the problems are corrected.

Air quality

As some livestock operations have grown larger and more people are choosing to live near livestock farms, odor (particularly hydrogen sulfide) has become an issue. There are regulations for hydrogen sulfide and ammonia, which can be toxic at high levels. The MPCA does not regulate odor in general; however some local units of government may have restrictions related to odor.

The MPCA does regulate hydrogen sulfide emissions and requires the following:

- Requiring odor management plans to be included in the permits of large feedlots.
- Monitoring hydrogen sulfide emissions at feedlots where there is a high potential for emission violations based on complaints and short-term hydrogen sulfide measurements.

Compliance and enforcement

The Feedlot Program has inspection goals specified in both the EnPPA negotiated with EPA, as well as in the MPCA's strategic plan.

Current and future improvement activities and integration into the watershed approach

The feedlot program uses proximity to impaired waters as one of the criteria to select sites for land application inspections and facility inspections. When the staff from one of the watershed units identifies a non-compliant feedlot, the feedlot staff conducts a site visit or works with the appropriate county feedlot staff to investigate.

Internal and external partners

The MPCA feedlot staff of engineers, hydrologists, soil scientists and pollution control specialists are located in St. Paul and six regional offices: Brainerd, Detroit Lakes, Mankato, Marshall, Rochester, and Willmar. They work in the areas of land application of manure, permitting, data management, and compliance with feedlot rules.

The feedlot program area has several important internal and external partners, including:

- **MPCA Watershed Unit:** The Feedlot Program will continue to use proximity to impaired water as one of the criteria for selecting sites for land application inspections and facility inspections. In addition, the Feedlot Program will continue to provide feedlot data to the Watershed Units for use in TMDL report preparation.
- **County Feedlot Programs:** The feedlot program area conducts frequent training sessions for County Feedlot Officers, reviews their programs on an annual basis and meets with the County Feedlot Officers' board on a quarterly basis. The feedlot program envisions continuing a similar level of partnership in the future to help ensure the county feedlot program continues to deliver a high level of service to local feedlot producers and efficient use of resources toward protecting the State's air, water and land.
- **Feedlot producers and producer trade associations:** The feedlot program will continue to provide outreach/assistance, conduct inspections to assess compliance, and issue permits to ensure individual producers' facilities are properly constructed and operated. In addition, the feedlot program will continue to work with producers' respective trade associations to provide educational materials to their members.
- **Environmental groups:** The feedlot program will continue to be responsive to data requests from environmental groups and meet with them to discuss any areas of concern.
- **Other state and federal entities (MDA, BWSR, NRCS, U of M Extension):** The feedlot program will continue to work with MDA, and the U of M Extension to develop outreach and assistance information for feedlot owners. In addition, the feedlot program will continue to work with BWSR and NRCS to identify feedlot operators that would benefit from receiving financial assistance to mitigate pollution issues at their sites. BWSR also administers the Delegated County Feedlot Grant Program through its Natural Resources Block Grant Program.

Prevention and assistance activities

The MPCA looks for opportunities to partner with internal and external stakeholders to improve the water program with prevention and assistance activities. Opportunities are focused on the development and implementation of pollution prevention and technical assistance options to improve the impact of the water program.

Prevention and assistance MPCA water activities focus on:

- wastewater facility, SSTs, biosolids permits and BMPs
- prevention based stormwater permits and BMP assistance

Technical assistance is based on priority needs identified in water program areas related to pollution prevention, BMP development, training, stakeholder input, and regulated community outreach. Needs are identified through water program staff, prevention and assistance division staff or the pollution prevention technical team.

Technical assistance needs are prioritized based on the following factors: the amount of resources needed for the assistance; the priority of the assistance request with the water program; and the amount of environmental impact anticipated from the assistance.

The following examples illustrate the MPCA's current prevention and assistance activities.

Subsurface sewage treatment systems training and licensing program

A Subsurface Sewage Treatment Systems (SSTS) license is required to do business in Minnesota as an SSTS installer, maintainer, service provider, designer, advanced designer, inspector, or advanced inspector. Local governments cannot require additional local licenses for septic system professionals.

There are four requirements for a business license application:

- proof of an SSTS Surety Bond
- proof of general liability insurance
- \$200 fee for each license specialty area per year
- proof of employment of at least one SSTS Certified Individual per specialty area

The goal of the SSTS program is to protect the public health and the environment through adequate treatment and dispersal of domestic sewage from dwellings or other establishments generating volumes less than 10,000 gallons per day. The MPCA accomplishes these goals by making periodic revisions to Minnesota's SSTS code, providing ongoing assistance in interpreting Minnesota's SSTS code; and administering the statewide SSTS certification and licensing program. SSTS ordinances are adopted and enforced locally. Requests for technical assistance are directed to the local unit of government or the MPCA Municipal Division SSTS unit.

Prevention-based stormwater permits and Best Management Practice assistance

The MPCA manages and provides technical assistance to the road salt training and certification program. The purpose of this program is to train and certify private and public individuals who apply chloride containing materials to parking lots, sidewalks as well as local, county and state roads in an effort to reduce the amount of chlorides entering Minnesota lakes, streams and groundwater. The training is four hours and includes an overview of impact of chlorides on Minnesota's environment; training on the BMPs for road salt application; practical exercises to help attendees compare current application practices to best practices and the resulting chloride reductions; and test reinforcing BMPs learned in the training. An individual is given a voluntary certification if:

- attended voluntary training
- completed and passed the associated test
- agreed to voluntarily apply Best Management Practices to reduce chloride impacts

The road salt training and certification classes are ongoing and currently there have been 1,982 certifications issued through the MPCA. For more information and a list of certificate holders, visit:

www.pca.state.mn.us/programs/roadsalt.html.

In 2009, Prevention and Assistance Division (PAD) staff, in partnership with the Mississippi Watershed Management Organization, developed and piloted a summer turf maintenance training and certification program (patterned after the road salt maintenance program). The purpose of this program is to train and certify individuals who maintain lawns in an effort to reduce the amount of pollutants entering Minnesota lakes, streams and groundwater. The training is five hours, including an overview of the impact of lawn maintenance activities on the Minnesota environment; training on the BMPs for lawn maintenance activities; practical exercises to help attendees compare current practices to best practices and the resulting pollutant reductions; and test reinforcing BMPs learned in the training. An individual is given a voluntary certification if:

- attended voluntary training
- completed and passed the associated test

- agreed to voluntarily apply best management practices to reduce impacts from summer maintenance activities

The summer maintenance training and certification classes are ongoing and currently there have been 96 certifications issued through the MPCA. For more information and a list of certificate holders, visit: www.pca.state.mn.us/programs/summermaintenance.html.

Low impact development

PAD staff works with stormwater staff to provide assistance to businesses, local governments and communities on the use of LID approaches. An internal lateral team coordinates LID activities across multiple MPCA divisions.

Business technical assistance

The small business technical assistance team provides technical support and answers questions during the roll-out of major water program initiatives. For example, this team provided support in the outreach to individuals impacted by new stormwater regulations to provide information on application of the no exposure part of the rule. Technical assistance through this PAD team is provided based on priorities identified through the water programs or PAD management. Technical Assistance from this team is ongoing.

Current and future improvement activities

As the water program continues to evolve, the vision for prevention and assistance activities will become more clear. Where waters are impaired, the process to implement a TMDL approach is defined and resources are available. However, as the need for preventative strategies arise in the water program, it is clear that a strategy and resources will need to be identified. A new area of water program assistance PAD management is considering is a proposal to assist in watershed implementation plan development. This PAD assistance effort would help lead or support the development of prevention/protection strategies as they are identified under the watershed approach. PAD management is attempting to identify the priority and resource needs for participation in this new water prevention/protection strategy development effort.

Another new prevention and assistance activity starting in FY 2011 is wastewater treatment facility and SSTS assistance. In some areas of the state, rivers and lakes are exceeding water quality standards for chlorides. Sources of chloride impairments can be associated with roadway anti-icing/de-icing, while others are associated with industrial and municipal wastewater discharges. Sources in municipal wastewater include industrial sources, water treatment plants (using reverse osmosis), phosphorus removal (where ferric chloride is used) and residential water softening. To address these impairments, technical assistance will be provided in the development and implementation of a residential water softener chloride reduction project.

The purpose of the project is to reduce the amount of residential chlorides so municipal wastewater treatment plants will no longer be causing or contributing to an impairment and the water can be removed from the impaired waters list. The objective of this project will be to restore chloride impaired waters using prevention and reduction tools. If successful, the second objective will be to prevent residential chloride impairments of waters and finally, the third objective is to reduce the amount of salt currently discharged from wastewater treatment plants. The first pilot project is expected to be implemented in Marshall, Minnesota in FY 2011.

Internal and external partners

PAD staff partner with staff from stormwater, wastewater, SSTS, and TMDL programs areas. In addition, PAD staff partner with external partners including: nonprofit organizations, local units of government, watershed districts and private companies. All partnerships have the goal of enhancing environmental protection through agricultural interests, pollution prevention and technical assistance activities.

Implementation, research and development funding

Funding for water quality implementation and research and development comes from both federal and state sources. Funding has remained steady, with some significant increases over the past several years, but the work needing to be accomplished in both water restoration and protection continues to outpace funding. Minnesota's 2008 passage of the Clean Water, Land and Legacy Amendment will help to ensure funding is available for this important work well into the future. Implementation funding is passed through to LGU's, water organizations, and other groups to ensure the work is conducted at the local level where involvement is a key to success.

Implementation funding

Implementation funding is made available for key areas within the broader agency work of wastewater, stormwater, agricultural, TMDL, and prevention. State sources of funding include direct legislative appropriations of state dollars, with a large portion of the funds coming from the Clean Water, Land and Legacy Amendment Fund (Clean Water Fund).

Amendment funds are allotted each fiscal biennium to several state environmental agencies for water protection efforts and are managed through interagency initiatives. Federal funding is provided through Clean Water Act programs at the EPA, and from the USDA via several Farm Bill conservation programs.

Wastewater¹⁷

Funding for planning and construction of wastewater capital infrastructure projects is available in the form of grants and/or loans to municipal entities. For the State Revolving Fund (SRF), the Public Facilities Authority (PFA) prepares an annual Intended Use Plan (IUP) based on a Project Priority List (PPL) developed by the MPCA. The IUP describes the projects and activities eligible for funding during the state fiscal year. The PPL also provides funding priority order for other PFA funding programs including Wastewater Infrastructure Fund (WIF), TMDL Wastewater grants, Phosphorus Reduction grants, and the Small Community Wastewater Treatment grant and loan program. The purpose of this component is to continue effective development and management of wastewater (and stormwater) through financial assistance programs. More information can be found at: www.pca.state.mn.us/index.php/water/water-types-and-programs/wastewater/wastewater-financial-assistance/wastewater-and-stormwater-financial-assistance.html.

Funding programs

Clean Water Act Section 319 Grant program

EPA has been awarding Section 319 funds to the state of Minnesota for over two decades. The guidelines for this funding require it to be used to address nonpoint source (NPS) water quality demonstration and implementation efforts and must be linked to nonpoint source water pollution control goals as cited in the state Nonpoint Source Management Program Plan (NSMPP). MPCA passes about \$3M to LGUs through a competitive award process. Grant funds must be matched by entities receiving awards to ensure leveraging of dollars. More information can be found at: www.pca.state.mn.us/water/cwp-319.html.

Clean Water Partnership (CWP) Grant and Loan program

Started in 1989, CWP was designed to provide funds to LGUs for diagnostic and implementation water quality work. Current legislative revisions to the CWP funding priorities have shifted the focus to protection efforts. Grant funds are allocated to the MPCA by the state legislature from the general fund and the Clean Water Fund. MPCA passes these funds to LGUs through a competitive award process. Grant funds must be matched by entities receiving awards to ensure strong leveraging of dollars. More information can be found at: www.pca.state.mn.us/water/cwp-319.html.

Clean Water, Land and Legacy Amendment Fund (Clean Water Fund)

The 2008 passage of this state constitutional amendment secured long-term funding for water quality work. The state legislature allocates funds each fiscal biennium to multiple state agencies who conduct water quality protection and restoration. The MPCA utilizes their amendment funds for TMDL and protection strategy development, wastewater, and water monitoring and assessment work. Projects are selected using an internal set of agency criteria that reflect capacity and readiness of the local partner to undertake the work, as well as regional diversity in project activity and impact. For more information about Clean Water Fund initiatives, please visit: www.pca.state.mn.us/water/cleanwaterfund.html.

Clean Water Revolving Fund (also known as the State Revolving Loan Fund - SRF), including Green Project Reserve (GPR), TMDL Wastewater, Phosphorus Reduction grants, Wastewater Infrastructure Fund (WIF) and Small Community Wastewater Treatment grant and loan programs

Low interest loan dollars and potentially principal forgiveness are made available to eligible municipal entities for point source (wastewater and stormwater) and nonpoint source projects. Funding is administered jointly between the MPCA and the Public Facilities Authority (PFA.) Projects must be on the MPCA's Project Priority List (PPL) for consideration. At the time of this publication, a State Rule revision is underway for the SRF. This is intended to enhance stormwater projects' (especially prevention projects') ability to qualify for financial assistance by bringing them within the range of fundable projects. In addition, the MPCA is considering other changes that may enhance stormwater projects' ability to qualify for financial assistance and other minor changes that impact both stormwater and wastewater. For more information, visit: www.pca.state.mn.us/water/revolvingfund.html.

¹⁷ **CPP Element 8:** A process for developing an inventory and ranking in order of priority of needs for construction of waste treatment works required to meet the applicable requirements of sections 301 and 302 of the CWA.

Stormwater

Financial assistance is available through the Green Project Reserve and the federal Clean Water State Revolving Fund (SRF). The 2011 IUP included the implementation of the Green Project Reserve (GPR) which provided a six-month dedication of funds for Green Infrastructure. This category of funding targets resources at municipal stormwater activities such as restoration of natural hydrology using LID, green streets, and permeable pavement parking lots. Stormwater related financial assistance information is available at: www.pca.state.mn.us/index.php/water/water-types-and-programs/wastewater/wastewater-financial-assistance/wastewater-and-stormwater-financial-assistance.html and www.pca.state.mn.us/grants/index.html.

Agriculture/feedlot

Funding for implementation of agriculturally-related BMPs such as those that reduce runoff, erosion and over-application of nutrients and pesticides are available through grants. Minnesota also has a delegated county feedlot program that provides direct financial support to counties for management of feedlot-related issues. MPCA allocates funds to participating counties. The Minnesota Department of Agriculture maintains a Conservation Funding Advisor website that provides extensive information on financial assistance for agricultural producers: www2.mda.state.mn.us/webapp/cpdt/queryBuilder_new.jsp.

Total Maximum Daily Load

Funding for TMDL implementation is available through grants and loans to LGUs. State funds are administered through two paths: one that addresses municipal wastewater and stormwater wasteload reductions under a TMDL (point source), the second that addresses LGUs implementation of BMPs outlined in an approved TMDL implementation plan, and/or local water plan (nonpoint source).

Research and development funding

Research and development on BMPs, nonpoint sources of water pollution, and innovative prevention activities are funded primarily with federal appropriations. Such projects must demonstrate new or improved BMPs that promote nonpoint source pollution control, generate information/educational materials for the public relating to nonpoint source pollution and its impact on water quality, or answer a research question related to these topics. Nonpoint source projects funded by federal CWA Section 319 must also draw a direct linkage to goals and objectives stated within the Minnesota Nonpoint Source Management Program Plan (NSMPP) which can be found at: www.pca.state.mn.us/index.php/water/water-types-and-programs/water-nonpoint-source-issues/minnesota-nonpoint-source-management-program-plan-nsmpp.html. The NSMPP is updated every five years and includes detailed information about the various MPCA nonpoint program areas. State appropriations may, on occasion, be used for research in TMDL development projects that require additional information to aid in the creation of the TMDL implementation plan.

- Clean Water Act Section 319 Grant program
- Clean Water, Land and Legacy Amendment Fund (Clean Water Fund)

Current and future improvement activities

The MPCA is exploring additional means of identifying areas, practices or consequences of practices that contribute disproportionately high pollutant loads with an objective of making the best use of restoration and protection dollars. These areas are referred to as Priority Management Zones (PMZs) or Critical Sources Areas (CSAs.) Further guidance is being developed to address PMZs. Additionally; the new watershed-based approach of addressing assessments and impairments in Minnesota waters is another way to help focus funding in concentrated areas leading to more comprehensive outcomes.

Internal and external partners

The 2006 creation of Minnesota's Clean Water Legacy Act, followed by the 2008 passage of the Minnesota Clean Water, Land and Legacy Amendment (Clean Water Fund), has brought numerous state agencies together in a manner previously not seen in Minnesota. The MPCA works closely with the Department of Agriculture, Department of Natural Resources, the Board of Water and Soil Resources, Public Facilities Authority, and the Department of Health to ensure coordinated funding efforts and reduce duplication of work. Because many implementation efforts occur at the local level, these agencies coordinate closely with LGUs.

Interagency teams have been formed to address the process of requesting, selecting, and awarding state funds; as well as to ensure consistency and accountability in tracking and reporting on funding. Outcomes will be transparent through the use of electronic and print sources. A Clean Water Fund webpage was created to provide cross-agency funding and outcomes data for internal and external parties. The Clean Water Fund page can be found at www.pca.state.mn.us/index.php/water/water-types-and-programs/clean-water-fund/clean-water-fund.html.

External implementation activities

The majority of nonpoint source implementation activities occur outside of the MPCA regulatory authority. Different state agencies, federal agencies, and local units of government work with citizens to implement BMP activities that will improve Minnesota's water quality. Some examples include agricultural BMPs, specific in-lake or in-stream treatments, and local ordinances, land-use planning and zoning activities. For example, the Board of Water and Soil Resources annually awards millions of dollars to LGUs for projects that implement priority activities as identified in a state approved and locally adopted local water management plan, conservation district plan, metro county groundwater plan, local surface water management plan, surface water intake plan, wellhead protection plan, or activities identified in a MPCA-approved TMDL implementation plan.

Appendix A

Continuing Planning Process Elements

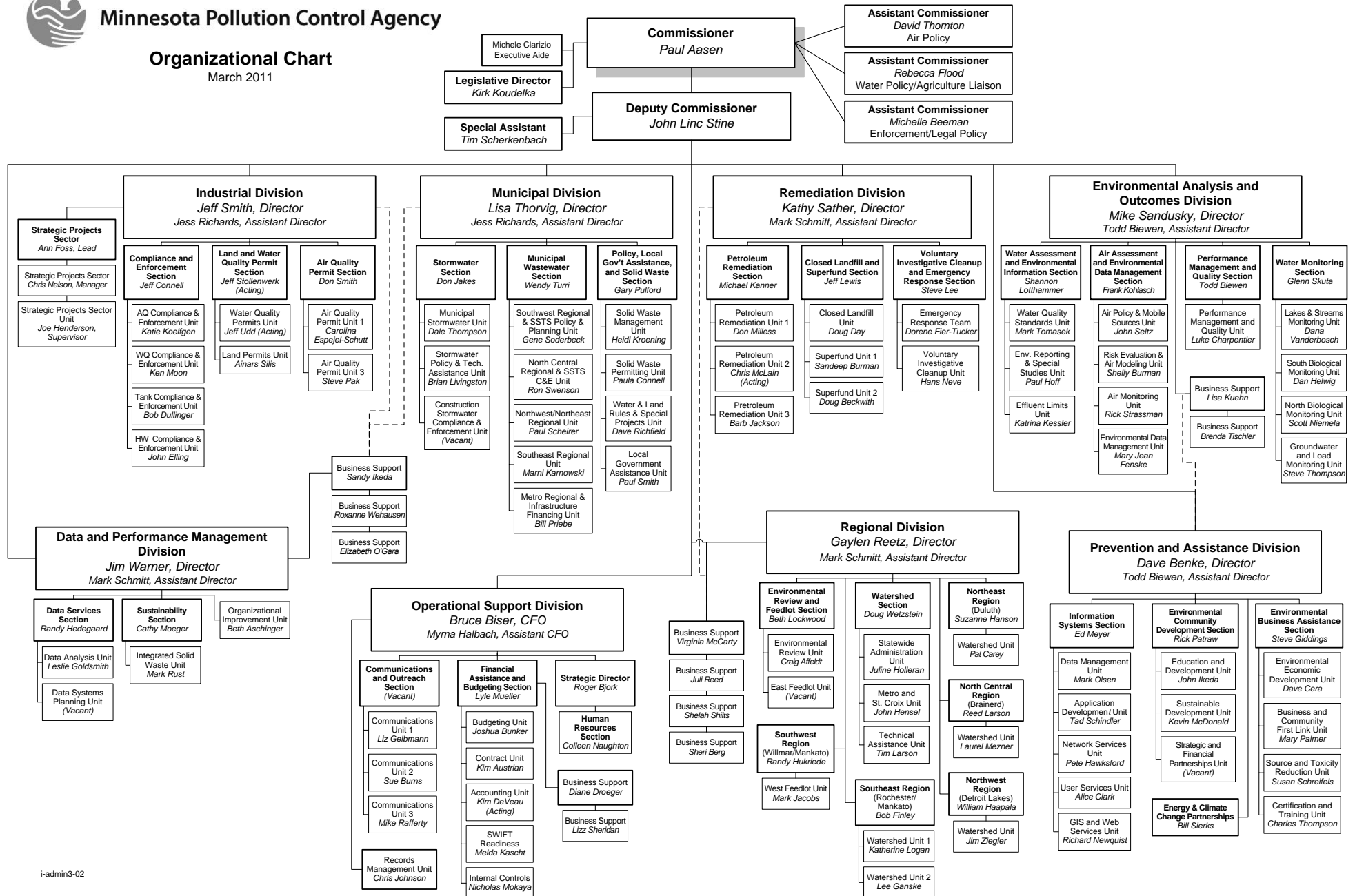
Element #	Description	Page #
Element 1	A process for developing effluent limitations and schedules of compliance at least as stringent as those required by sections 301(b)(1) and (2), 306 and 307, and at least as stringent as any requirements contained in applicable water quality standards in effect under the authority of section 303 of the Clean Water Act (CWA).	49, 56
Element 2	A process for incorporating elements of any applicable area-wide waste treatment plans under section 208, and applicable basin plans under section 209 of the CWA.	8, 48, 53
Element 3	Process for developing Total Maximum Daily Loads (TMDLs) and individual water-quality based effluent limitations for pollutants in accordance with section 303(d) of the CWA and section 40 CFR § 130.7(a).	33, 48, 49
Element 4	Process for updating and maintaining Water Quality Management Plans, including schedules for revisions.	39
Element 5	A process for assuring adequate authority for intergovernmental cooperation in the implementation of the state Water Quality Management program.	6, 39, 47, 72
Element 6	A process for establishing and assuring adequate implementation of new or revised water quality standards, including schedules of compliance, under section 303(c) of the CWA.	13, 47
Element 7	A process for assuring adequate controls over the disposition of all residual waste from any water treatment processing.	52
Element 8	A process for developing an inventory and ranking in order of priority of needs for construction of waste treatment works required to meet the applicable requirements of sections 301 and 302 of the CWA.	66
Element 9	A process for determining the priority of permit issuance.	53, 57



Minnesota Pollution Control Agency

Organizational Chart

March 2011



Appendix C

The basis for Minnesota's water quality programs

Authorities for the water quality programs and responsibilities carried out by the MPCA are derived from numerous state and federal legislative mandates.

Federal legislation

The major federal authorities for the state's water quality programs are found in sections of the Clean Water Act (CWA). Many of these Clean Water Act mandates have been delegated by the U.S. Environmental Protection Agency (EPA) to the state.

- *Section 205(j)* – This section of the Clean Water Act provides federal set-aside money for each state to be used for planning purposes.
- *Section 208* – Development of area-wide management plans
- *Section 301* – Discharge of pollutants into surface waters is prohibited unless permitted by EPA (see Section 402 below).
- *Section 303(c)* – States are responsible for reviewing, establishing, and revising water quality standards for all surface waters
- *Section 303(d)* – Each state must identify those waters within its boundaries for which the effluent limits required by Section 301(b)(1) A and B are not stringent enough to protect any water quality standards applicable to such waters. Current regulations only require listing of segments still requiring TMDLs.
- *Section 303(e)* – Each state is required to develop a continuing planning process that describes the processes and procedures it uses in water quality management, and how this process will result in water-quality plans for all navigable waters within the state.
- *Section 305(b)* – Each state is required to submit a biennial report to the EPA describing the status of surface waters in the state.
- *Section 319* – Each state is required to develop and implement a nonpoint source pollution management program.
- *Section 401* – Section 401 requires that, prior to the issuance of any federal permit, any party applying for the permit must receive a state Water Quality Certification indicating that the proposed discharge will be in compliance with applicable water quality standards.
- *Section 402* – The National Pollutant Discharge Elimination System (NPDES) permitting program is established to achieve and enforce effluent limitations.
- *Section 404* – Section 404 regulates the discharge of fill materials into navigable waters and adjoining wetlands unless permitted by the U.S. Army Corps of Engineers (Corps).

Some of the other federal laws that guide the state's water quality programs are listed below.

- Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 requires all states with approved coastal zone management programs to develop Coastal Nonpoint Control Programs to address the impacts of nonpoint source pollution on Great Lakes coastal waters. Joint responsibility for program administration is held by EPA and NOAA.
- The Safe Drinking Water Act requires all states to prepare Source Water Protection assessments for public water supplies and to provide funding to promote drinking water infrastructure improvements. It also requires EPA to implement an underground injection control program to prevent contamination of underground drinking water sources by subsurface injection of wastes.

State legislation and rules¹⁸

The major authorities for state water quality programs are found in Minnesota Statutes and the State of Minnesota Rules. Minnesota Statutes Chapters 115 and 116 established the Minnesota Pollution Control Agency and provide the agency with broad authorities to write rules, establish standards, enforce pollution laws and investigate waters of the state. Minnesota Statutes Chapter 114D, the Clean Water Legacy Act, guides water program activities. The specific chapters of Minnesota Rules listed below relate to water quality. We list these rules and statutes for information purposes only.

- **Chapter 7000 — Procedural Rules:** This chapter describes how the agency makes decisions and how members of the public may involve themselves in agency decision making. The procedures and standards of conduct established in this chapter are intended to ensure an orderly and fair decision-making process, to preserve the integrity and independence of agency decisions, and to promote public confidence in those decisions.
- **Chapter 7001 — Permits:** Except as otherwise specifically provided, parts 7001.0010 to 7001.0210 apply to the following:
 - A. (not applicable to water programs)
 - B. (not applicable to water programs)
 - C. An agency permit required for the treatment, distribution, utilization, storage, or disposal of sewage sludge.
 - D. An agency permit required for the construction, installation, or operation of a disposal system. Part 7001.0040, subparts 1 and 3, apply to permits for sewer extensions, except that the time period referenced in those subparts shall be 60 days instead of 180 days. Parts 7001.0100, subparts 4 and 5; 7001.0110; and 7001.0150 do not apply to permits for sewer extensions.
 - E. An agency permit required for the discharge of a pollutant into the waters of the state from a point source.
 - F. An agency permit required for the construction or operation of a feedlot; however, parts 7001.0040 to 7001.0070 do not apply to these permits. Parts 7001.0100, subparts 4 and 5, and 7001.0110 do not apply to animal feedlot interim permits.
 - G. (not applicable to water programs)
 - H. (not applicable to water programs)
 - I. The processing of certifications under section 401 of the Clean Water Act, United States Code, title 33, section 1341, to the extent provided by parts 7001.1400 to 7001.1470.
- **Chapter 7020 — Animal Feedlots:** The provisions of parts 7020.0200 to 7020.0900 govern the storage, transportation, disposal, and utilization of animal manure and the application for and issuance of permits and certificates of compliance for construction and operation of animal manure management and disposal or utilization systems for the protection of the environment.
- **Chapter 7041— Sewage Sludge Management:** Establishes requirements for the storage and land application of sewage sludge.
- **Chapter 7048 — Waste Disposal: Operators and Inspectors:** This chapter implements the requirement of Minnesota Statutes, section 116.41, subdivision 2, that the Minnesota Pollution Control Agency shall require operators and inspectors of waste disposal facilities to obtain a certificate of competency from the agency.

¹⁸ **CPP Element 5:** A process for assuring adequate authority for intergovernmental cooperation in the implementation of the state Water Quality Management program.

- **Chapter 7049 — Wastewater Pretreatment:** Provides for the prevention and control of pollutants entering a wastewater treatment plant that could compromise its ability to function properly.
- **Chapter 7050 — Waters of the State:** Parts 7050.0110 to 7050.0227 apply to all waters of the state, both surface and underground, and include general provisions applicable to the maintenance of water quality and aquatic habitats; definitions of water use classes; standards for dischargers of sewage, industrial, and other wastes; and standards of quality and purity for specific water use classes. This chapter shall apply to point source and nonpoint source discharges and to physical alterations of wetlands. Other water quality rules of general or specific application that include any more stringent water quality or effluent standards or prohibitions are preserved.
- **Chapter 7052 — Lake Superior Basin Water Standards:**
 - A. This chapter establishes aquatic life, human health, and wildlife water quality standards and criteria for Great Lakes Initiative (GLI) pollutants; nondegradation standards for surface waters of the state in the Lake Superior Basin including, on a limited basis as described in item B, Class 7 waters; and implementation procedures for deriving effluent limitations from these standards and criteria. Other water quality standards, nondegradation standards, and implementation procedures applicable to the surface waters of the state in the Lake Superior Basin can be found in chapters 7050 and 7065.
 - B. The water quality standards, nondegradation standards, and implementation procedures in this chapter apply to discharges to Class 7 waters to the extent necessary to ensure compliance with the standards established in this chapter in any downstream Class 2 waters.
- **Chapter 7053 — State Waters Discharge Restrictions:** Requirements for discharges to waters of the state.
- **Chapter 7060 — Underground Waters:** It is the purpose of this chapter to preserve and protect the underground waters of the state by preventing any new pollution and abating existing pollution.
- **Chapter 7076 — Clean Water Partnership Financial Assistance:** This chapter provides for the administration of the state clean water partnership financial assistance program and the federal nonpoint source management program as provided by United States Code, title 33, section 1329. Parts 7076.0100 to 7076.0290 implement these programs by establishing the substantive criteria and procedural conditions under which the agency may award state matching grants and provide technical assistance for the development and implementation of nonpoint source projects, and also award low-interest loans from the state Water Pollution Control Revolving Fund for the implementation of nonpoint source projects.
- **Chapter 7077 — Wastewater and Stormwater Treatment Assistance:** This chapter provides for the Minnesota Pollution Control Agency's administration of financial assistance programs for the construction of municipal wastewater treatment systems. The programs in this chapter are:
 - A. the financial assistance program, consisting of:
 1. the wastewater infrastructure fund, Minn. Stat. § 446A.071
 2. the state revolving fund, Minn. Stat. § 446A.07
 3. the state independent grants program for grants awarded on or after July 1, 1990, under Minn. Stat. § 116.18, subd. 3a
 - B. the combined sewer overflow program for grants awarded on or after July 1, 1990, under Minn. Stat. § 116.162

C. the individual sewage treatment systems grants program for grants awarded on or after July 1, 1990, under Minn. Stat § 116.18, subd. 3c

1. Parts 7077.0111 to 7077.0292 apply to the financial assistance program.
 2. Parts 7077.0300 to 7077.0330 apply to the combined sewer overflow program.
 3. Parts 7077.0700 to 7077.0765 apply to the individual sewage treatment systems grants program.
- **Chapter 7080 — Individual Sewage Treatment Systems Program:** The improper location, design, installation, use, and maintenance of individual sewage treatment systems adversely affects the public health, safety, and general welfare by discharge of inadequately treated sewage to the ground surface, surface waters, and ground waters. In accordance with the authority granted in Minnesota Statutes, chapters 103F, 103G, 115, and 116, the Minnesota Pollution Control Agency, hereinafter referred to as the agency, does hereby provide the minimum standards and criteria for individual sewage treatment systems, and thus protects the surface and ground waters of the state, and promotes the public health, safety, and general welfare. **Note Chapters 7081, 7082, and 7083 address additional related issues.**
 - **Chapter 7090 — Stormwater Regulatory Program:** Establishes the permit program for stormwater discharges.
 - **Chapter 9400 — Water Treatment Certification:** Establishes certification requirements for operators of water and wastewater treatment facilities.