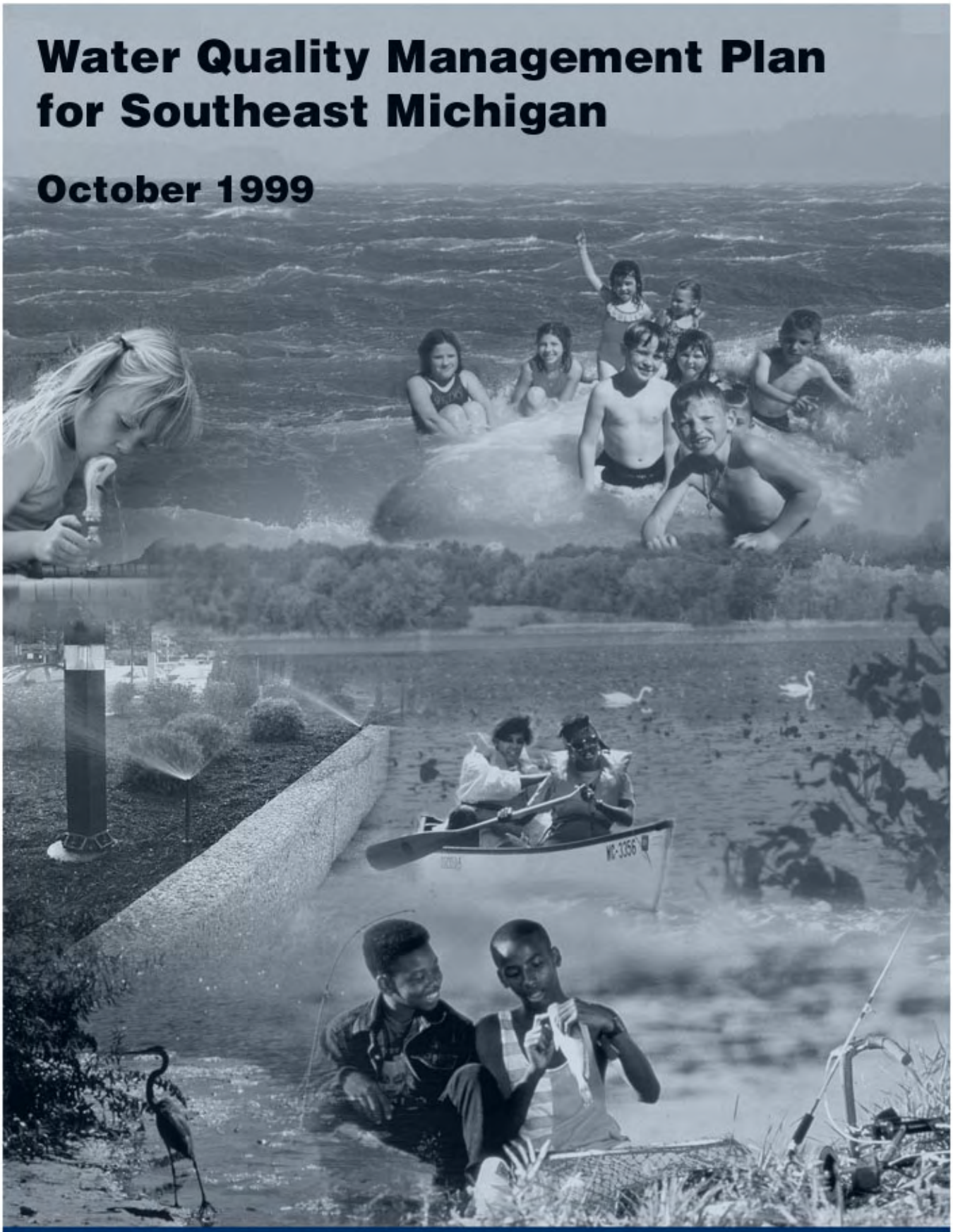
Water Quality Management Plan for Southeast Michigan

October 1999



SEMCOG... Local Governments Partnering For Progress

Southeast Michigan Council of Governments

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Abstract

SEMCOG is the designated Areawide Water Quality Planning Agency for Southeast Michigan under Public Law 92-500, the Federal Clean Water Act. Pursuant to this designation, SEMCOG is responsible for preparing this regional water quality management plan. The plan contains water quality management policies on a broad range of issues including infrastructure, monitoring, management, nonpoint source pollution, storm water, pollution prevention and public education. These policies are directed to various agencies and organizations that have a role in the stewardship of the region's water resources.

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Preface

The fundamental basis for regulating discharges of pollutants to waters of the United States was established by the Clean Water Act, a 1977 amendment to the Federal Water Pollution Control Act of 1972 (33 U.S.C. §1251). The Act required the development and implementation of an areawide water quality management plan to assure adequate control of pollution sources. These plans were to provide a framework to work toward national water pollution goals.

The Congressional Declaration of Goals of the Act stated, "the objective of this chapter is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. In order to achieve this objective it is hereby declared that, consistent with the provisions of this chapter –

- It is the national goal that discharge of pollutants into navigable water is eliminated by 1985;

- It is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish and wildlife and provides for recreation in and on the water be achieved by July 1, 1983;

- It is national policy that the discharge of toxic pollutants in toxic amounts be prohibited;

- It is national policy that federal financial assistance be provided to construct publicly owned waste treatment works;

- It is the national policy that areawide waste treatment management planning processes be developed and implemented to assure adequate control of sources of pollution in each state;

- It is the national policy that a major research and demonstration effort be made to develop technology necessary to eliminate the discharge of pollutants into navigable water, waters of the contiguous zone and the oceans;

- It is the national policy that programs for the control of nonpoint sources of pollution be developed and implemented in an expeditious manner so as to enable the goals of this chapter to be met through the control of both point and nonpoint sources of pollution."[1]

Through passing these goals and policies, the Act envisioned that all surface waters of the country would be fishable and swimable. The law and the regulations required that each state

[1]US Code, Title 33, Section 1251.

maintain a Continuing Planning Process (CPP), a part of which is a state water quality management plan. Agencies such as SEMCOG were empowered to produce parts of the state plan for their jurisdictions. In 1976, then Governor Milliken designated SEMCOG as the Areawide Water Quality Planning Agency responsible for preparing the Southeast Michigan portion of the state's water quality management plan. SEMCOG adopted the initial *Water Quality Management Plan for Southeast Michigan* in June 1978.

The regulations also listed the required contents of the Plan; some of these responsibilities were retained by the state. SEMCOG, through a Memorandum of Understanding with the state, assumed responsibility for certain required plan elements for Southeast Michigan. SEMCOG's responsibilities included addressing wastewater infrastructure, nonpoint source pollution management, continued regional planning and evaluation, and monitoring plan implementation. Finally, the regulations required that the United States Environmental Protection Agency (USEPA) ensure that provisions of construction grants and National Pollutant Discharge Elimination System (NPDES) programs of the state were consistent with the water quality management plan.[2]

The Clean Water Act was reauthorized in 1987 and continues to be directed towards regulating toxic pollutants.

Inherent in this updated *Water Quality Management Plan for Southeast Michigan* (Plan) is the recognition that Southeast Michigan is a regional community of local governments. Local governments are the building blocks upon which the process for water quality management and decision making is predicated. It is also at this local level that major responsibilities for Plan implementation rest. This updated Plan does not pre-empt the authority of this existing structure. Instead, the Plan is designed to complement and reinforce local management and decision-making within an areawide context. An areawide approach to the problems of water quality management provides a vehicle through which local units of government may work more effectively to achieve the goals and objectives of their individual communities, as well as wider regional goals and objectives. An active role in the formulation and implementation of water quality policies and programs is recognized as both the right and the responsibility of every governmental unit in the region.

[2]40 Code of Federal Regulations (CFR) §130.12, Coordination with other programs.

Executive Summary

The Water Quality Management Plan for Southeast Michigan (Plan), adopted in 1978 and amended in 1979 and 1981, has been reexamined, updated and revised into this new document.

SEMCOG staff, with the advice of a Task Force made up of members of the Environmental Policy Advisory Council (EPAC), developed proposed amendments to the Plan. These recommendations were brought to EPAC, forwarded to SEMCOG's Executive Committee for approval and adopted by the General Assembly of local elected officials in October 1999.

The Plan focuses on restoration and maintenance of designated uses for different surface waters — aquatic life, wildlife support, agriculture, industrial and municipal water supply, navigation and swimming — and supports watershed management in addressing pollution control (see Appendix A).

The Plan outlines progress made since the original Plan was adopted and amended. It discusses regional goals and summarizes policy statements. It also includes a guide to implementation for various stakeholders and defines SEMCOG's role in the process. Chapters on Watershed Planning and Management, Nonpoint Source Management, Water Quality Infrastructure, Habitat, Public Education and Participation, and Pollution Prevention discuss these required plan elements for Southeast Michigan.

This revised Plan recognizes the role of local governments in water quality management and decision-making for their individual communities. Major responsibilities for Plan implementation also rest at this local level, with an increasing focus on intergovernmental cooperation and regional goals and objectives.

Introduction

Southeast Michigan is a regional community made up of seven counties (Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw and Wayne) and 234 local units of government. It is home to 4.8 million people, approximately half the population of the State of Michigan.

Southeast Michigan contains seven major river watersheds, as well as hundreds of inland lakes. As seen in Figure 1, all of the region's surface waters are tributary to the Great Lakes. Thus, the quality of water in Southeast Michigan is critical to the health and welfare of the region's citizens as well as the Great Lakes' ecosystem.

As a result of numerous federal, state and local government efforts as well as the adoption of the initial water quality management plan, water quality in Southeast Michigan improved significantly since the 1980s. Initial efforts in water quality management focused on reducing discharges from point sources of pollution such as municipal wastewater treatment plants and industry. The combined efforts of the private sector and governmental units at all levels has resulted in the elimination of millions of tons of pollutant discharges to water. Even after these massive reductions in loadings, our ability to use many of these waters for specific purposes (designated uses) continues to be limited because of unacceptable levels of pollution. This means much work remains if we are to restore and preserve the designated uses of the region's water resources and reap the resulting quality of life benefits.

The goal of the Clean Water Act is that all surface waters be fishable and swimable. However, there are a number of other resource functions that surface waters can provide, and the State of Michigan has adopted standards for each of these designated uses. Examples of designated uses include full body contact, partial body contact and agriculture and water supply. These standards vary for each specific intended or designated use of the waterbody. A more complete description of state standards and designated uses is in Appendix A of this Plan.

The Plan focuses on the restoration and maintenance of designated uses. A critical part of the planning processes described in the Plan is for communities to come together and develop restoration and maintenance strategies that are compatible with the desired designated uses for different surface waters. This is designed to help focus priorities for resource allocation and broader recognition regarding how various surface waters serve as a community asset and to incorporate these priorities into the various components of governing (e.g., zoning, planning, site plan review).

Figure 1
Southeast Michigan — Tributary to the Great Lakes System

Future Challenge: Developed Areas

The challenge is twofold and is best seen by examining the development patterns over time in Southeast Michigan (see Figure 2). Older, developed areas continue to face expensive infrastructure challenges related to sewer system capacity, maintenance and surface runoff. The construction of basins to retain and treat water from combined sewer systems and the separation of sewer systems to address pollution for wet weather events need to be accompanied by new programs to limit pollution from nonpoint sources such as storm water runoff, fertilizer, etc. At the same time, these older urban areas are faced with declining tax bases and aging infrastructure resulting in decreasing availability of revenue to support water quality enhancement.

Future Challenge: Developing Areas

At the same time, major land use and demographic changes are occurring in developing areas of Southeast Michigan presenting daunting challenges to water quality and environmental protection. Figure 2 shows that nearly a quarter of a million additional acres of land will become urbanized by 2020. Without effective management, these demographic changes will result in serious water quality degradation in the upstream (headwater) areas, quite likely undoing the benefits of the expensive programs implemented in the more developed downstream areas. One way to visualize this impact is to examine changes in the amount of impervious area in Southeast Michigan. Figure 3 shows impervious area in 1995 and Figure 4 shows how much more extensive areas of imperviousness would be if each community's current master plan was implemented. Clearly, the future quality of water in this region is largely dependent on how development is managed.

Updated Plan Focuses on Utilizing Existing Institutions

This Plan focuses on next steps needed in restoring and maintaining the designated uses throughout the region. A variety of policies are set forth to guide decision makers in the numerous institutions whose activities impact water quality. As part of its role in continuing areawide water quality planning, SEMCOG will advocate for the adoption and implementation of these policies by as many institutions as possible.

The identification of specific programs needed to achieve water quality goals is best accomplished at a different level. Remedial Action Plans, Lakewide Management Plans and the local-government-based subwatershed planning called for in this Plan are among the most appropriate forums for identifying and implementing these specific actions. The policies in this Plan provide a framework for the process and substance of water quality management that can be applied in each of these efforts.

Figure 2
Urbanization in Southeast Michigan 1965, 1995, 2020

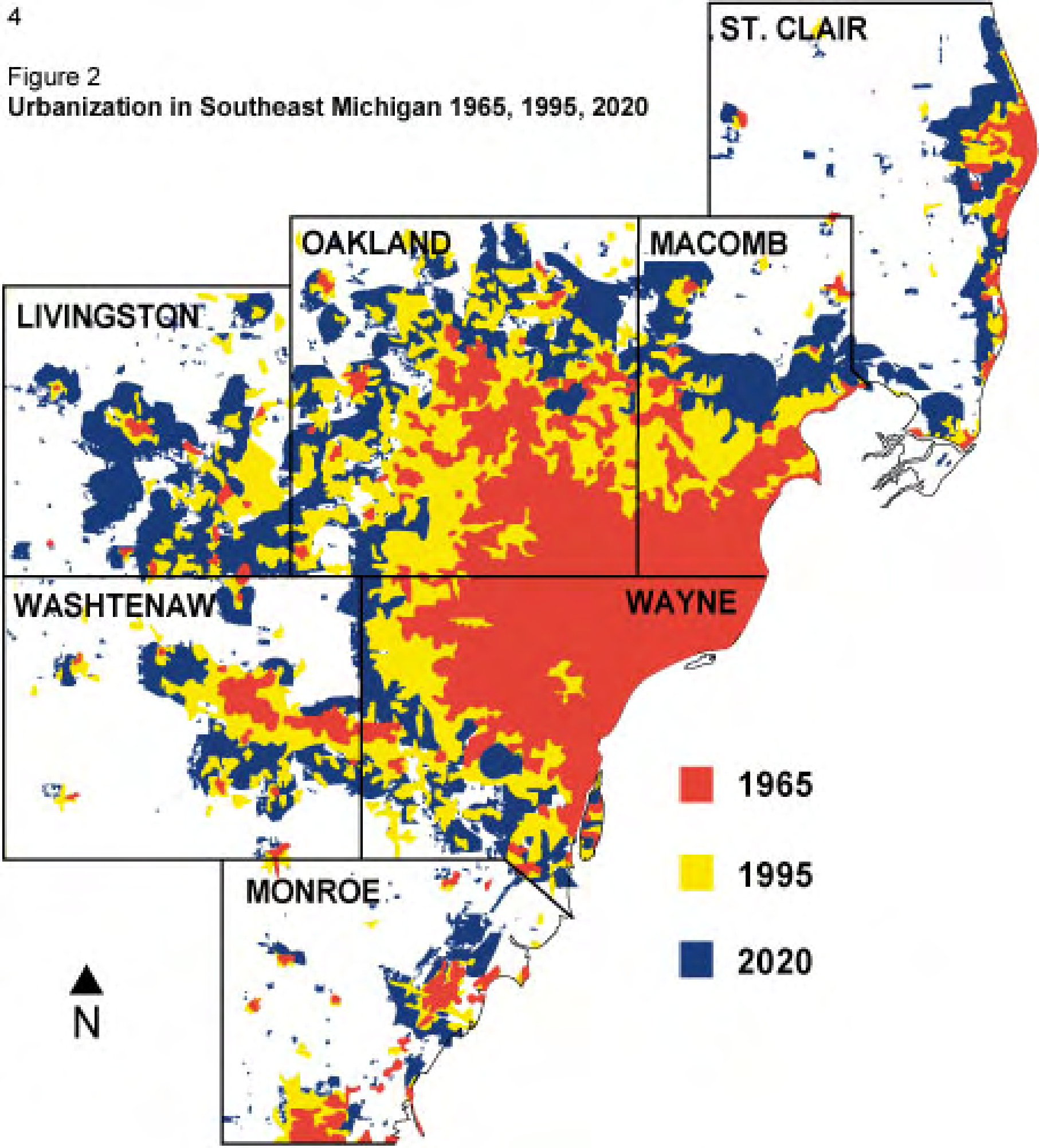
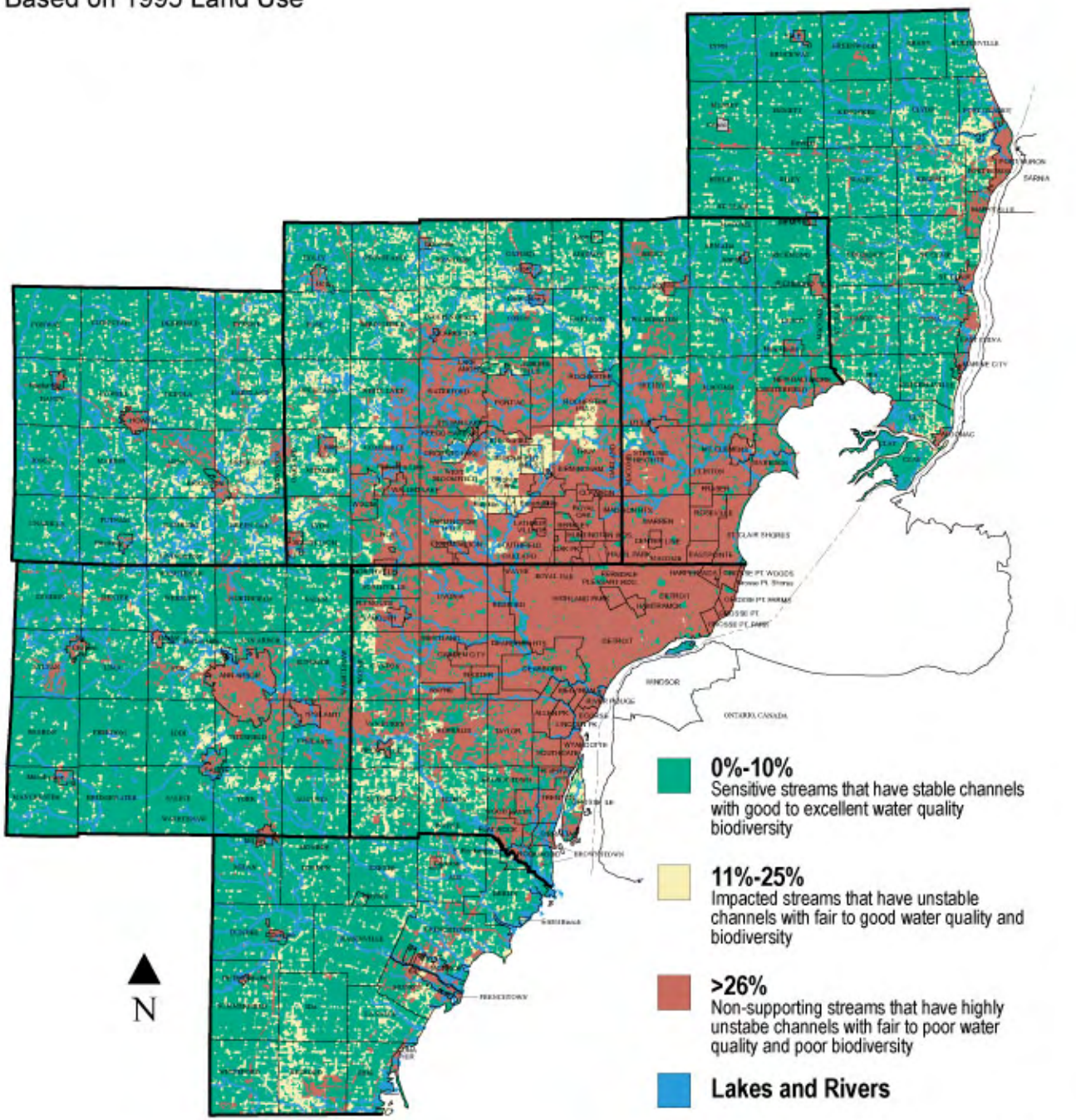


Figure 3
Current Impervious Surface*
and Water Quality, Southeast Michigan
Based on 1995 Land Use

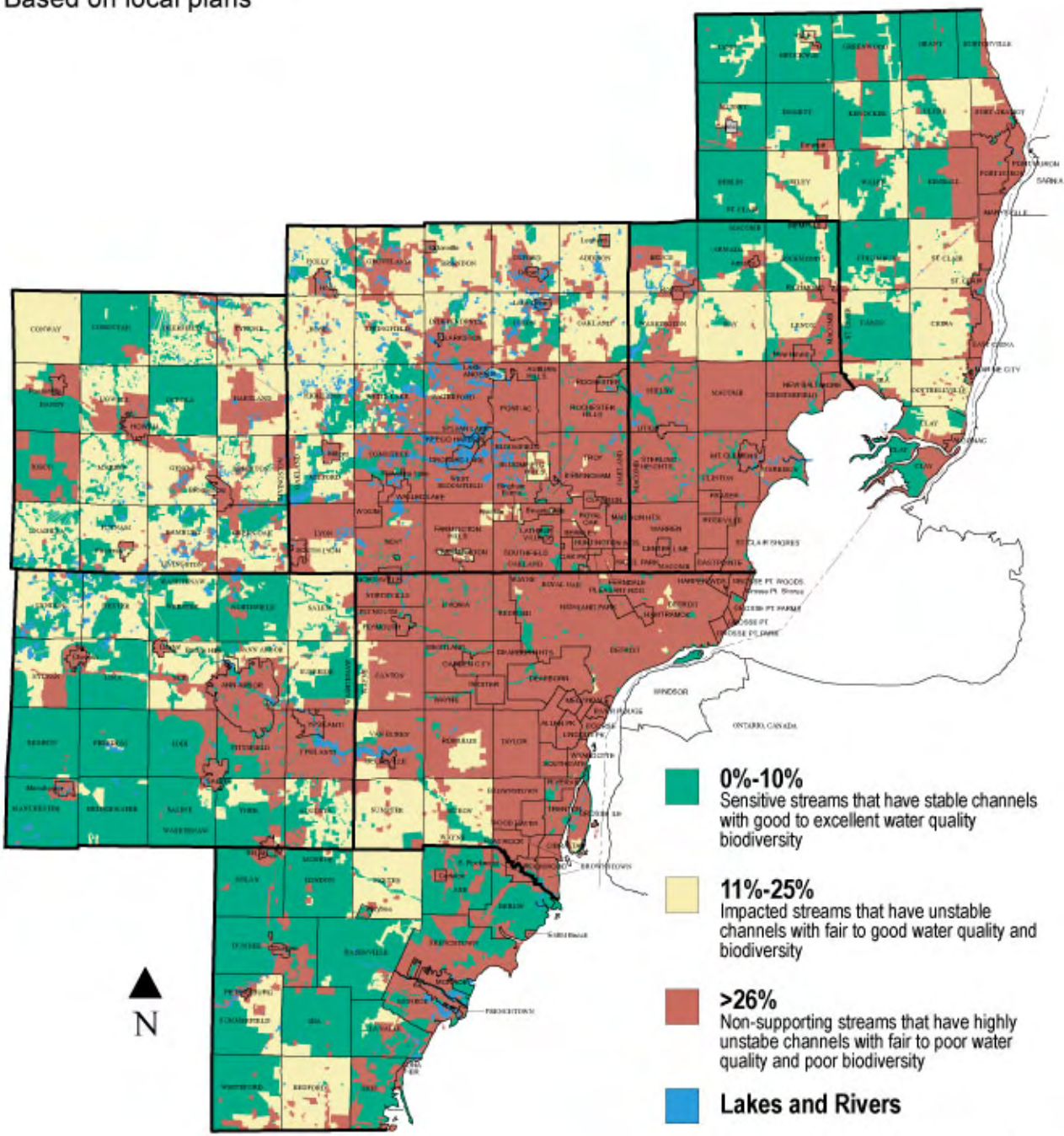


Legend categories based on Thomas Schueler, "Crafting Better Urban Watershed Protection Plans," Watershed Protection Techniques, Center for Watershed Protection.

* Impervious surfaces are those that prevent the infiltration of water into the soil. For this study, lakes and rivers are excluded from total area.

Data Source: SEMCOG

Figure 4
Future Impervious Surface*
and Water Quality, Southeast Michigan
Based on local plans



Legend categories based on Thomas Schueler, ICrafting Better Urban Watershed Protection Plans,I Watershed Protection Techniques, Center for Watershed Protection.

* Impervious surfaces are those that prevent the infiltration of water into the soil. For this study, lakes are excluded from total area.

Data Source: SEMCOG

New Directions for a New Plan

This Plan calls for more cooperative efforts to provide new infrastructure compatible with the land use type it will serve. Also, new infrastructure needs to be designed and maintained in a sustainable manner and built only in those cases where existing infrastructure cannot be utilized. Realistically, this can only be accomplished through cooperative planning by wastewater treatment providers.

Protection of water resources from pollution from a variety of nonpoint sources will require improved monitoring systems and a cooperative watershed-based approach to restoring and protecting designated uses. Resource-based local land use planning is a key factor in the protection of wetlands and stream corridors as well as providing proper management for the placement and maintenance of on-site sewage systems. New partnerships will be required for subwatershed and watershed planning and implementation along with innovative watershed and inter-basin coordination mechanisms.

Continued improvement in Southeast Michigan's lakes, rivers, groundwater and the bordering of portions of the Great Lakes system requires far more than programs to control large point sources of discharge. It will require integrating water resource stewardship into the public's daily practices as well as into community plans and implementation practices. It will require planning and implementing on a watershed basis and the development of new partnerships dedicated to preventing pollution.

The support of state and regulatory agencies is also essential to the successful implementation of this Plan. SEMCOG will work with these agencies to identify as many opportunities as possible for them to incorporate the policies of this Plan into their decision-making.

Key stakeholders in water quality protection are local units of government who, through their comprehensive land use planning, have the tools and authority to guide development ensuring that water resources are protected and enhanced. SEMCOG is another important stakeholder, playing a key role in maintaining and advocating for the policies in this regional Plan and fostering intergovernmental approaches to water protection. SEMCOG also commits to providing information, technical assistance and advocacy essential for local governments to implement their water quality protection responsibilities.

Progress since 1980

While all national, state and local goals and objectives have not been completely met, much has been accomplished in Southeast Michigan in the past 20 years, with continued progress on the horizon. Examples of accomplishments include:

- Major point source discharges have been controlled, are subject to a permit and are in substantial compliance, resulting in the removal and prevention of millions of tons of pollutant discharges to surface waters.

- Most publicly owned treatment works (POTWs) provide at least secondary treatment to sanitary sewage and, in many cases, tertiary treatment.

- Regional policy for Southeast Michigan now directs limited state and federal sewer construction funds toward priority needs.

- Wet-weather pollution controls are in various stages of development, such as:
  - Combined sewer overflows (CSO) controls are being put into place.
  - Communities have voluntarily sought coverage under the state's General Storm Water Permit and storm water control programs are under development.

- Wetland protection and mitigation projects are in place.

- Remedial Action Plans (RAPs) have been developed for the five Southeast Michigan Areas of Concern, and a Lakewide Management Plan (LaMP) for Lake Erie is being developed.

- Citizens (general public) are much more aware of water quality issues and have become active participants in stewardship of the resource.

- A phosphorus ban for laundry detergents has been enacted.

- Legislation and rules providing protection of ground and surface waters from contamination from landfills has been enacted as has been legislation providing regulation of hazardous wastes from point of generation through reuse, disposal or destruction.

Glossary [3]

Areas of Concern (AOC)
A geographic area that fails to meet the general or specific objectives of the Great Lakes Water Quality Agreement where such failure has caused or is likely to cause impairment of beneficial use or of the area's ability to support aquatic life.

Atmospheric Deposition
Chemicals or substances in rain or snow or attached to dust-size airborne particles that fall to earth; in an environmental context, usually refers to polluting materials deposited in a quantity sufficient to have a detrimental effect.

Buffer/Buffer Strip
A management area closest to a sensitive environmental site (e.g., wetland, waterbody, etc.) in which human activities are prohibited or limited in order to minimize the negative impact from adjacent land uses (e.g., erosion, filter runoff pollutants, disturbances of wildlife) affecting the sensitive environmental site.

Combined Sewers
A sewer system that carries both sewage and storm water runoff. Normally, its entire flow goes to a waste treatment plan, but during a heavy storm, the storm water volume may be so great as to cause overflows called combined sewer overflows (CSO). When this happens, untreated mixtures of storm water and sewage flow into receiving waters.

Clean Water Act
The common name for the U.S. Federal Water Pollution Control Act of 1977, enacted to "restore and maintain the chemical, physical and biological integrity of the nations waters."

Designated Uses
Each of Michigan's surface waters is protected by the Water Quality Standards for specific designated uses. The protected designated uses are aquatic life (either cold water or warm water) and wildlife support, agricultural, industrial, and municipal water supply, navigation and total body contact recreation.

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[3]Definition of several terms adapted from the "Glossary of Great Lakes Ecosystem Management Terms," excerpted from the *1992 USEPA Report to Congress on the Great Lakes Ecosystem* and 40 CFR 130. 2, Definitions.

Erosion
The wearing away of the earth's surface and transportation of rock and soil debris by wind, rain, or running water.

Exotic Species
Plant or animal species introduced into an area where they do not occur naturally.

Floodplain
Lowlands bordering a river which are subject to flooding.

Groundwater
Water found underground in 1) shallow silt, sand and gravel deposits or 2) deep, fractured or porous rock.

Habitat
The physical location or type of environment in which an organism or biological population lives or occurs.

Headwaters
A term used when refering to the origin of a river.

Loading
An amount of matter or thermal energy that is introduced into a receiving water, may be human-caused (e.g., pollutant loading) or natural.

National Pollutant Discharge Elimination Systems (NPDES)
The national program for controlling discharges of pollutants into the waters of the United States. Permits are issued by the Michigan Department of Environmental Quality (MDEQ) which authorizes the discharge of wastewater. The MDEQ stipulates the quality of the discharge and sets time limits for compliance.

Natural Resources and Environmental Protection Act (NREPA)
Michigan Public Act 451 of 1994, which codifies state environmental law and has been amended several times, incorporating dozens of environmental statutes.

Nonpoint Source Pollution
Pollution from sources that cannot be defined as discrete points; includes rain, runoff from adjacent lands or air deposition that enters a waterbody.

Open Space
The combined area of primary and secondary conservation areas within an open space

residential development, not individually owned, which is designed and intended to conserve environmental features for the common use or enjoyment of residents of the development or the public. Such open space may contain accessory structures and improvements appropriate for recreational purposes, as provided by ordinance.

Point Source Pollution
Single, identifiable source of pollutants (e.g., pipe or smokestack) which discharge from a fixed point.

Pretreatment
Processes used to reduce, eliminate or alter pollutants from nonresidential sources before they are discharged into publicly owned sewage treatment systems.

Publicly Owned Treatment Work (POTW)
A waste treatment facility owned by a state, unit of local government or Indian tribe.

Remedial Action Plans (RAPs)
Environmental plans aimed at restoring all beneficial uses to Great Lakes Areas of Concern (AOCs).

Riparian
An area adjacent to a body of water (e.g., shoreline property).

Runoff
Precipitation that travels over the surface of the land, in contrast to that which permeates the soil.

Sedimentation
Gravitational deposit of transported material in flowing or standing water.

Septage
Waste materials from septic systems.

Sewage
The waste and wastewater discharged into sewers from homes and industry.

Sewer
A channel or conduit that carries wastewater and storm water runoff from its source to a treatment plant or receiving stream.

Surface Water
In Michigan, the Great Lakes and inland lakes, ponds, rivers, streams, creeks, certain

wetlands and open drains; legal definition may vary by statute.

Sustainable Development
Development that meets the needs of the present without compromising the ability of future generations to meet their needs.

Total Maximum Daily Load (TMDL)
TMDLs are a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards and an allocation of that amount to the pollutant's sources.

Waste Treatment Plant
A facility containing a series of tanks, screens and other processes by which pollutants are removed from water.

Wastewater
The spent or used water from an individual home, a community, a farm or an industry that often contains dissolved or suspended matter.

Water Pollution
Discharges at levels that impair protected water uses.

Watershed
A land area that drains into a particular river system; a region or area bounded peripherally by a divide and draining ultimately into a particular watercourse or waterbody.

Wetland
An area that is regularly saturated by surface water or groundwater and is characterized by a prevalence of vegetation that is adapted for life in saturated soil conditions (e.g., swamps, bogs, fens, marshes and estuaries).

Regional Goals

The regional goals of the *Water Quality Management Plan for Southeast Michigan* (Plan) were developed to guide water quality management planning and implementation and are tailored to the needs of Southeast Michigan. These goals are also intended to assure that deleterious impacts on the Great Lakes and connecting channels from the waters of this region are reduced or eliminated. As previously mentioned, the Plan focuses on the next steps needed to maintain and restore designated uses in the region and is reflected in these updated goals.

The goals for water quality management in Southeast Michigan are:

1. To protect, enhance and restore the chemical, physical and biological integrity of the waters of Southeast Michigan in order to achieve designated uses.

2. To foster a watershed management ethic that promotes sustainable development by recognizing the interdependence of natural systems and considers both upstream and downstream impacts of land use decisions.

3. To develop an awareness that water quality management needs to be part of a broader ecosystem approach in order to ensure that both impacts and solutions are evaluated holistically and that secondary impacts (unintended consequences) are anticipated and addressed.

4. To achieve and maintain designated uses by preventing new and reducing existing negative water quality and quantity problems from nonpoint sources.

5. To ensure the provision of structural and non-structural pollution control measures, including pollution prevention and considering impacts on fragile natural resources, while respecting public and private property rights.

6. To ensure that the regulation, location, modification, construction and operation of any facilities, activities or substantive changes in use of lands, which might result in any new or deleterious discharge directly or indirectly into the region's waters, are undertaken in a manner that promotes sustainable land use development patterns.

7. To ensure the development and implementation of laws, programs and practices that prevent the discharge or deposition of toxic pollutants in toxic amounts into the region's waterbodies.

8. To promote and support local initiatives for water quality management, including the development of watershed and subwatershed management plans and strategies.

9. To ensure the preparation of water quality management strategies that are technically, environmentally, economically, politically and socially feasible.

10. To ensure areawide water quality planning is integrated with other planning efforts, including emerging local, regional, state and federal policies and programs geared toward sustainable development.

11. To support the development, update and implementation of locally based watershed plans such as the RAPs for the Clinton, Detroit, Raisin, Rouge and St. Clair Rivers, Lakewide Management Plans and subwatershed management plans.

12. To provide for public participation in the planning process so that areawide water quality management programs reflect the concerns, priorities and values of the region's stakeholders.

13. To increase the level of awareness of citizens, technicians and elected officials of the interdependence of Southeast Michigan's communities with respect to both water quality problems and the value of developing collaborative approaches for achieving, protecting and maintaining designated uses.

14. To facilitate both intra-regional and inter-regional cooperation in addressing water quality issues and concerns.

15. To secure advocacy and support of Plan goals and policies from all stakeholders including federal, state and local governments.

16. To assure a system of wastewater residual management that effectively eliminates negative effects on the quality of the environment.

17. To provide sufficient sanitary sewage treatment facilities necessary to ensure protection of public health and the environment, and to support achievement of designated uses and the sustainability of our environmental resources.

18. To plan wastewater treatment facilities in coordination with the provision of other public services and facilities in a manner that promotes sustainable development.

19. To provide a coordinated, efficient and effective management system capable of addressing water quality problems from all sources in an integrated fashion.

20. To ensure that equitable ways of allocating costs of water quality management are established.

21. To provide educational programs for Southeast Michigan stakeholders, including those programs that advocate voluntary pollution prevention actions and stewardship of water resources by the general public, government and business.

Guide to Plan Implementation

Overview

During development and adoption of the original *Water Quality Management Plan for Southeast Michigan* (Plan), there was a tendency by some to view the Plan as a regulatory document. Much of the language in the original Plan reflected that thought process; the best example is statements about what other organizations "must" do. There was also a presumption reflected in the language in the Plan that it would be fully embraced by all responsible institutions.

History and experience have shown that both of these concepts need significant adjustment. It is inconsistent for an agency such as SEMCOG, a voluntary association of local units of government, to adopt a plan telling member units of government what they must do. SEMCOG is not a regulatory agency and the Plan is not a regulatory document.

Also, it is unrealistic to assume that the previous Plan or this updated Plan would be fully embraced by all agencies and organizations with some responsibility for water quality management, especially if it appears to dictate specific solutions to problems.

There is a major difference in focus in this revised regional Plan. Listed below are some of the many purposes this Plan is intended to serve:

- The Plan focuses more on what organizations with some responsibility for water quality management or actions which affect water quality *could* do, as opposed to what they must do.

- The Plan helps facilitate the leveraging of resources, talent and authority already embodied in existing institutions that are charged with implementation.

- The Plan identifies policies and programs that specific organizations or groups of organizations could undertake.

- The Plan educates and informs those organizations on the advantages of embracing those policies and programs as part of their everyday practices.

- The Plan focuses on nurturing collaboration and partnerships in water quality management and protection activities and provides/offers an institutional framework for moving forward (e.g., subwatershed management groups).

Summary of Policy Statements

Overview

Listed below for reference purposes is a summary of the policies adopted as part of the *Water Quality Management Plan for Southeast Michigan* (Plan). The full text of each policy and background are located in the Plan under the corresponding subheading.

Watershed Planning and Management

Water quality planning coordination

SEMCOG, in fulfilling its responsibilities under the Plan, will serve on behalf of local governments as both an advocate and a clearinghouse for federal and state legislation, policy and programs that will contribute to the restoration and preservation of designated uses in the region's waters.

SEMCOG will foster communication, coordination and technology transfer among participants in Remedial Action Plans (RAPs), Lakewide Management Plans (LaMPs), watershed council initiatives and watershed and subwatershed plans.

Communities, businesses, environmental organizations and the State of Michigan should support the development, update and implementation of locally based watershed plans.

Water quality monitoring

State and local governments and other appropriate agencies should cooperatively establish monitoring programs to support the achievement of designated uses through subwatershed and watershed management plans. The Michigan Department of Environmental Quality (MDEQ) should provide technical support and guidance in the development of these programs. The monitoring programs should focus on the following:

- The monitoring programs should be sufficiently comprehensive to ascertain physical, chemical and biological characteristics and trends.

- They should be specific to each watershed plan and designed to meet the objectives of that plan.

- The parameters selected for collection and analysis should be those relevant to the plan objectives and collected at such locations and with such frequency and quantities as will provide:

  - sufficient information to determine the overall health of the water system,
  - permit evaluation of progress toward plan objectives and
  - meet any minimum compliance requirements for applicable permits.

- Monitoring programs should be responsive to community needs, as stated in the plan, and be cost-effective. Participants in the monitoring plan can include the state, local governments, universities, consultants, permitees and volunteers.

Volunteer monitoring efforts provide relevant data and stewardship opportunities. These programs should be encouraged and focused on monitoring habitat, macroinvertebrates and amphibians, as well as performance indicators such as improved aesthetics and participation in recreational activities.

The state should support monitoring programs designed to identify illicit discharges to storm drains.

In order to protect the habitat of Southeast Michigan, the state and communities should support and implement fisheries and habitat management programs consistent with the Plan.

The state should implement a monitoring program designed to adequately assess the quality of our region's resources, including developing and implementing a monitoring program to support issuance of fish consumption advisories.

Data gathered in the monitoring program should be readily available to decision makers and the public in appropriate quantities and formats including, digital databases and, where possible, on the Internet.

SEMCOG should advocate for sufficient funds from appropriate sources for needed monitoring programs.

Monitoring programs should consider utilizing environmental indicators as part of their program.

SEMCOG will also advocate for funding to create a comprehensive program to monitor concentrations of toxic compounds in the atmosphere.

Watershed management

Watershed management must be built on partnerships identified and designed by local governments. Local governments should exercise their responsibility for water quality protection by engaging in watershed and subwatershed planning and implementation.

Subwatershed implementation groups should be formed, with membership made up of individual communities and public and private agencies, especially watershed councils. These groups should be responsible for completing subwatershed management plans that identify goals and alternative actions to meet those goals.

Comprehensive watershed-wide coordination is essential to successful watershed management and must be designated by, and accountable to, the local governments and other entities within the watershed, consistent with local home rule.

The areawide coordination mechanism used in the federal Transportation Equity Act for the 21st Century (TEA-21) should be considered as a model for watershed-wide coordination.

SEMCOG will provide information and technical assistance to all levels of the watershed management system.

Water quality trading

Public and private entities in Southeast Michigan should consider water quality trading as another mechanism for achieving, protecting and maintaining designated uses of surface waters, consistent with the following principles:

- Credits should not be used if a trade would result in a localized water quality problem.
- Water quality trading should not be used to avoid compliance with the Clean Water Act.
- Credits should be used to meet water quality limits, but not to avoid having limits established.
- There is a net environmental benefit gained by each trade through the retirement of a portion of all credits generated. This benefit should be over and above that which existing programs would realize.
- Land-based pollution prevention activities should be implemented to generate credits.
- Unpermitted nonpoint sources should use models to estimate reductions in pollutant loadings and account for uncertainty in the modeling process through an increase in the required retirement credit.
- The use of credits should be limited to the watershed where they are generated.

- Public agencies and local governments should generate and use credits as a means of cost-effectively achieving, protecting and maintaining designated uses of Southeast Michigan's surface waters.

- Seasonal use of credits should be limited to prevent problems associated with nutrient loadings during the summer months.

- Any trade where a lake, pond or impoundment is downstream of the user or within a non-attainment area should include the retirement of additional credits to ensure that a greater environmental benefit is achieved.

Environmental indicators

In order to maximize resources and gather comprehensible information to support decision-making and implementation, subwatershed planning groups need to identify specific environmental indicators as part of their planning process.

Information derived from indicators should be used by communities and state and federal agencies in formulating environmental protection laws and regulations and in developing resource protection and education programs.

Nonpoint Source Management

Storm water runoff

Surface water degradation from storm water runoff in Southeast Michigan must be prevented or significantly reduced as part of the overall strategy for achieving and maintaining designated uses of the region's surface waters.

Communities are responsible for the quality and quantity of storm water that is generated within and that leaves their jurisdiction.

Communities should work together and with other agencies, such as road commissions, planning departments and drain commissions in the development of watershed management plans that can serve as guidance for incorporating best management practices into zoning, site plan review and other review mechanisms.

In their plans, communities should identify a combination of preventative and remedial measures that take into account the land and water features within their jurisdiction.

Measures to control stream degradation should be conducted in a manner consistent with adopted multi-community watershed and subwatershed plans.

SEMCOG should work with other agencies in providing information and technical assistance to communities, with special emphasis on those experiencing rapid growth in the headwaters areas of the region.

SEMCOG should also advocate for legislation and programs that assist local governments in effective and efficient storm water management.

In order to help facilitate cooperation in watershed planning, communities served by separate storm systems should apply for the State of Michigan general storm water permit.

Erosion and sedimentation

Public education on the benefits of erosion control and how to recognize and report noncompliance are needed to assist local communities in implementing an effective erosion control program.

State and federal agencies need to provide technical assistance to support the work of the local enforcing agency, businesses and farmers utilizing erosion control techniques.

Existing permit programs for mitigating erosion and sedimentation from construction sites need to be evaluated to assure adequacy of the program.

Communities have several opportunities to assure that sedimentation control is effectively achieved through the following actions:

- Communities need to ensure plans for erosion control are feasible and sensitive areas are not disturbed as part of the site plan review process.

- Communities need to verify that the soil erosion control permit has been issued and the required best management practices are installed before issuing the local construction permit.

- Upon completion of construction, local communities need to assure that all erosion control permit requirements have been satisfied before issuing the local occupancy permit.

- Communities need to Increase inspections on active construction sites. Local inspectors visiting construction sites for other purposes can be cross-trained to recognize and report noncompliance with the erosion control provisions.

To prevent sedimentation and soil loss from agricultural areas, farmers need to utilize various types of buffer strips to effectively mitigate the movement of sediment, nutrients and pesticides from farm fields.

Maintaining a strong buffer system and reducing the amount of impervious surfaces around the water resource is imperative in reducing streambank erosion and should be incorporated in local planning processes through such mechanisms as overlay zoning.

On-site disposal systems

A statewide on-site disposal system management program is needed that clearly delineates regulatory responsibilities for siting, installation, inspection, septage disposal and enforcement of applicable codes and ordinances.

To be effective, a statewide on-site disposal system management program needs a stable funding source(s). Revenues should be derived mainly from septage generators.

Communities should identify areas within their borders where septic systems would be prohibited or limited in extent, including areas that are unsuitable for on-site systems and areas that the community wishes to designate as permanent open space. Community ordinances should establish minimum lot size requirements for on-site systems. In areas where on-site systems are expected to be permanent, ordinances should provide for separation of the on-site systems from waterbodies and other natural resources and from property set aside for alternate septic fields.

County health departments should take into account local planning and zoning provisions when determining the suitability of a property for an on-site wastewater disposal system.
Proper maintenance of on-site systems is essential to attainment and protection of sustainable uses. Communities should select from a variety of options for assuring proper maintenance.

Illicit discharges

Municipal building departments should ensure that building inspectors are adequately trained to recognize plumbing cross connections during the construction phase.

Environmental health departments should work with owners and operators of separate storm systems to develop and implement illicit discharge identification and elimination programs.

Groundwater

Groundwater protection should be incorporated into community zoning, site plan review and master planning processes.

Communities, watershed councils and various other stakeholders should educate citizens dependent on groundwater about how their actions can affect the quality of their groundwater (through nonpoint source pollution).

State and federal agencies should continue to support groundwater protection by providing both fiscal and technical resources to communities, watershed councils and other stakeholders undertaking educational and wellhead protection programs.

MDEQ should assure that fiscal resources are available to properly enforce laws and regulations.

Local governments, county health departments and MDEQ should assess the adequacy of existing programs to properly close unused or abandoned wells.

In order to reduce nonpoint source pollution, which often results in groundwater contamination, communities in Southeast Michigan should apply for coverage under the Michigan voluntary general storm water permit.

Contaminated sediments

The State of Michigan, impacted localities and other appropriate parties should cooperate to prioritize and remediate known areas of contaminated sediments which impair designated uses.

SEMCOG will advocate on behalf of local governments for state and federal financial assistance to remediate contaminated sediments that impair beneficial uses in Southeast Michigan.

Atmospheric deposition

In order to achieve control and minimize impacts of pollution deposited from the atmosphere, SEMCOG will continue to support and advocate for regulations and programs designed to achieve continued, steady progress in reducing emissions of toxic pollutants to the atmosphere. SEMCOG will also advocate for funding to create a comprehensive program to monitor concentrations of toxic compounds in the atmosphere.

Water Quality Infrastructure

Wastewater treatment capacity

The utilization of existing wastewater treatment infrastructure is encouraged. To support this, an inventory of the capacity of existing and planned wastewater systems should be conducted. New treatment capacity should not be added until it is determined that existing capacity is not sufficient or available to meet needs. In areas where treatment capacity is reaching its limits, the adequacy of the sewage transport system and the ability of the publicly owned treatment works (POTW) receiving the wastewater to provide adequate treatment need to be considered before new connections are allowed.

Local governments should determine the wastewater infrastructure needs for their community considering at least the following:

- operation, maintenance and replacement needs for the existing infrastructure,
- expected additional capacity needs based on the master plan, zoning and growth and
- capacity of land to support on-site systems.

Combined sewer overflows (CSOs) initially should be mitigated using the appropriate mix of affordable technology and practices.

National pollutant discharge elimination system (NPDES) permits should require owners and/or operators of all systems to ensure that revenue streams are sufficient to cover the cost of the necessary repairs, operation and maintenance.

When new capacity must be provided to meet current and future needs it should be done in a manner that reflects local and regional sustainable development goals and policies.

The experience of treatment facilities with large retention basins to supplement or take the place of sewer separation should be considered.

MDEQ should work with local governments in developing policies to address overflows from separate sanitary systems.

Sanitary sewer service

The Detroit Water and Sewerage Department (DWSD) and other multi-community wastewater treatment providers are encouraged to jointly plan with their current and future wholesale customers for the amount and location of new sewer service.

Local sewer planning should consider the plans and growth patterns of adjoining municipalities, as well as county and regional plans and policies.

Development plans need to be compatible with planned sewer service.

Developed areas dependent upon on-site systems which are either currently experiencing septic system failure or expecting such failures should be a priority for corrective action.
SEMCOG's regional development forecast must be considered the demographic basis for determining future sewer needs in communities in Southeast Michigan.

Allocation of limited state and federal funding
Growth and development pressures will require the construction of additional capacity to meet new needs. The cost of providing additional capacity should be paid for by those receiving the new service.

To the extent possible, outside funding should be sought to meet current and future needs within the existing infrastructure service areas.

Federal and state funding for sewer service should be targeted toward resolving documented existing health problems or those areas identified in SEMCOG's "areas eligible for sewer service funding" map.

Wastewater management coordination
A Southeast Michigan Wastewater Treatment and Collection Providers' Forum should be established for the purposes of addressing common and emerging issues and the facilitation of information and technology sharing.

Habitat

Protection of habitat
All stakeholders within the region should strive for a balance protecting between habitat and changing land use patterns, leading to a more sustainable region.

Communities should have a natural features inventory performed for their community and use this information to update master plans, zoning and other ordinances.

As part of the subwatershed planning process, communities should work together to develop plans that connect valuable habitat areas.

Communities should encourage preservation and restoration of their natural areas through:

- open space ordinances,
- cluster development,
- purchase of development rights,
- transfer of development rights,
- land purchase,
- overlay zoning techniques and
- other ordinances as deemed necessary.

Communities and state and federal agencies should support the work of land conservancies. Communities and subwatershed planning groups should integrate these preserved parcels into their local and subwatershed planning processes.

Businesses should incorporate natural landscaping into their landscape practices. Communities should incorporate natural landscaping into their property and should require it as part of their site plan review process.

Communities should incorporate natural landscaping into their property and require it as part of their site plan review process.

Businesses and communities should work together to maintain the natural drainage system when proposing and reviewing a site plan.

State and federal agencies should be encouraged to continue programs that monitor and prevent the spread of exotic species in the region. Businesses, citizens and communities should be educated about exotics and how to prevent future propagation in the region.

Regional, state and federal agencies should support and implement fisheries and habitat management programs consistent with the Plan.

The state should implement a monitoring program designed to adequately assess the quality of our region's resources, including developing and implementing a monitoring program to support issuance of fish consumption advisories.

State and federal agencies should provide technical assistance to local governments on natural resource conservation issues.

Protection of wetlands

State and local policies and, where appropriate, private sector initiatives, need to be adopted to protect, restore, enhance and increase wetlands in Southeast Michigan. A "no net loss of wetlands" policy should be the minimum goal of this effort.

Fundamental to wetland protection is an accurate inventory of wetland resources. The state should complete its inventory of wetlands, giving priority to those in imminent danger of degradation.

Using proven, cost-effective techniques, local governments should conduct field inventories to produce accurate maps of wetlands within their jurisdiction and should consider adoption of local wetland ordinances consistent with state law. These maps and ordinances should be integrated into the community's comprehensive planning process.

Wetland mitigation projects and wetland banks established for future mitigation should provide, in the affected watershed, replacement of significant functions having the same or greater value than those lost in permitted wetland alteration activities.

SEMCOG will advocate for preservation of wetlands through open space planning and the acquisition of high-priority wetlands by both the public and private sector.

Protecting the stream corridor

Local governments should incorporate measures into their master plans and ordinances to protect the 100-year floodplain areas. No building encroachments should be allowed which will significantly impact flood storage capacity, water quality protection functions or wildlife habitat.

Local floodplains regulatory ordinances should go beyond the minimum standards of federal and state floodplains protection laws to preserve the environmental values of floodplains.

Communities should conduct a corridor inventory to identify preventive and remedial opportunities that may mitigate impacts of existing or future development.

Public trailways, where appropriate and feasible, should be incorporated into riparian corridors as an effective way to ensure widespread public support for the plans.

Through preservation and restoration, communities should actively strive to achieve and maintain the natural land use in riparian zones.

Communities should cooperate to maintain, where feasible, continuous riparian corridors. Where feasible, stream crossings by roads or utility lines should be limited to less than two per kilometer of stream length. Effective erosion control at stream crossings should be employed.

New discharges from storm drains into streams or natural wetlands should be managed so that some combination of buffering, pre-treatment and best management practices eliminates or minimizes the velocity and quantity of discharges and pollutant loadings. Communities should also reduce, through retrofitting, impacts from existing discharges to the extent practicable.

Because the definition of floodplain areas varies over time as a result of anthropogenic activities, MDEQ or the Federal Emergency Management Agency (FEMA) should periodically update the floodplain maps for Southeast Michigan to ensure that local governments have accurate information regarding the extent of floodplains.

Public Education and Participation

Public education and stewardship

Communities should develop programs and products that promote the identity and value of water resources in their community.

Communities should develop specific activities to increase awareness of the water resource.

SEMCOG should support local efforts by providing informational materials and acting as a clearinghouse for public education materials in Southeast Michigan.

Owners and operators of POTWs should be active participants in developing and distributing educational materials within their service area.

Consistent with their increasing participation in environmental protection, businesses should be active participants in increasing environmental awareness and providing stewardship opportunities for their employees, customers and the community.

Student education programs should be developed in all watersheds in Southeast Michigan.

Environmental programs should be developed in all watersheds in Southeast Michigan.

The ongoing efforts of local watershed councils, such as the annual regional River Day, should be supported.

Communities should develop programs for the business community, such as Washtenaw County's Business Partners for Clean Streams Program and the state Retired Engineer Technical Assistance Program (RETAP).

A speaker's bureau should be developed and utilized providing stakeholders with information on the identity and value of their water resources and specific actions and stewardship programs in which they can participate.

Communities should create centers that contain informational materials, kiosks and/or maps that show the location and value of their water resource and provide stewardship opportunities for the various stakeholder groups.

Communities, the media and environmental organizations should reward good behavior that protects our region's water resources.

Public participation
Stakeholders should be active participants in developing subwatershed and watershed plans.

Visible and user-friendly, two-way communication mechanisms should be developed between stakeholders and plan developers.

Pollution Prevention

SEMCOG should serve as a clearinghouse for pollution prevention information related to local governmental activities.

The Providers Forum (see Water Quality Infrastructure section) should be used as a means of disseminating pollution prevention information to POTW operators.

Businesses and municipalities should implement pollution prevention and waste reduction philosophies into their operations and practices.

As part of their own pollution prevention strategies, businesses and municipalities should work with their suppliers and contractors to ensure that appropriate pollution prevention programs are developed and implemented as a means for reducing waste throughout the production cycle.

Local governments should develop public education and outreach programs to inform citizens and businesses of how their individual actions impact water quality and provide information on how they can modify their activities to eliminate or reduce their impact on water quality.

Local governments should review their ordinances, particularly their sewer use ordinance, and identify appropriate opportunities to require the adoption of pollution prevention measures.

Businesses should develop public education and outreach programs to inform their customers and clients of their pollution prevention strategy and the benefits of waste reduction over waste management.

SEMCOG should support the education of business, government and citizens on the benefits of pollution prevention and the process for implementing those measures.

Guide to Plan Implementation

Overview

During development and adoption of the original *Water Quality Management Plan for Southeast Michigan* (Plan), there was a tendency by some to view the Plan as a regulatory document. Much of the language in the original Plan reflected that thought process; the best example is statements about what other organizations "must" do. There was also a presumption reflected in the language in the Plan that it would be fully embraced by all responsible institutions.

History and experience have shown that both of these concepts need significant adjustment. It is inconsistent for an agency such as SEMCOG, a voluntary association of local units of government, to adopt a plan telling member units of government what they must do. SEMCOG is not a regulatory agency and the Plan is not a regulatory document.

Also, it is unrealistic to assume that the previous Plan or this updated Plan would be fully embraced by all agencies and organizations with some responsibility for water quality management, especially if it appears to dictate specific solutions to problems.

There is a major difference in focus in this revised regional Plan. Listed below are some of the many purposes this Plan is intended to serve:

- The Plan focuses more on what organizations with some responsibility for water quality management or actions which affect water quality *could* do, as opposed to what they must do.

- The Plan helps facilitate the leveraging of resources, talent and authority already embodied in existing institutions that are charged with implementation.

- The Plan identifies policies and programs that specific organizations or groups of organizations could undertake.

- The Plan educates and informs those organizations on the advantages of embracing those policies and programs as part of their everyday practices.

- The Plan focuses on nurturing collaboration and partnerships in water quality management and protection activities and provides/offers an institutional framework for moving forward (e.g., subwatershed management groups).

In summary, an overriding purpose of the Plan is to be a resource and tool supporting water quality management activities of the various organizations that are either responsible for water quality protection or make decisions on projects that will impact water quality.

Implementing Organizations

One of the key aims of the Plan is to secure advocacy and support its goals and policies from all stakeholders including federal, state and local governments. As an initial step in that process, the following section briefly describes those organizations actively involved in water quality management programs or whose actions often can have a significant impact on water quality. It also includes possible uses of the Plan by these organizations, based on their key responsibilities and activities. The listing of key responsibilities is not intended to be exhaustive, but rather to highlight anticipated roles. As a primary advocate for the Plan, SEMCOG will seek to inform those organizations of how their programs and projects relate to the policies in the Plan and advocate for their endorsement.

Implementing organization: Southeast Michigan Council of Governments

As a regional planning agency representing local units of government, SEMCOG, the Southeast Michigan Council of Governments, has a number of opportunities to support water quality enhancement and protection. In its role as the designated areawide water quality planning agency in Southeast Michigan, SEMCOG is the primary advocate for the Plan.

Key responsibilities

- advocate that local units of government carry out their responsibilities under the Plan,
- provide technical support to local units of government (and their planning consultants) to assist in carrying out their responsibilities under the Plan,
- advocate for intergovernmental cooperation and support subwatershed planning, as appropriate,
- adopt policies in other regional plans which are consistent with water quality protection,
- seek funding supportive of the Plan,
- serve as an advocate and clearinghouse for federal and state legislation, policy and programs that will contribute to the restoration and preservation of designated uses in the region's waters,
- report on progress in achieving goals of the Plan,
- establish a Southeast Michigan Wastewater Treatment and Collection Providers' Forum to address common and emerging issues and facilitate information and technology sharing,
- continue the regional review of proposed state or federally funded projects for consistency with the Plan as the "single point of contact" under the Michigan Federal Project Review System and

- provide periodic updates of the Plan based on changes in laws and regulation and input from member governments and implementing organizations.

Implementing organization: Local units of government

There are a number of opportunities for local units of government to implement and advocate for water quality enhancement and protection. Local units of government need to examine the full range of their practices and procedures, as well their plans, to identify opportunities for executing these measures. Under Michigan home rule, local governments have the ability and authority to implement a variety of water quality management programs independently. Even so, collaboration with other units of government through the subwatershed planning process will often be necessary.

Key responsibilities

- revisit master plans to assess water quality implications,
- revisit zoning ordinances to assess water quality implications,
- reduce pollution,
- ensure that the site plan review process protects water quality and adequately addresses infrastructure needs,
- evaluate other ordinances (e.g., open space, floodplain, etc.) for water quality stewardship consistent with the policies in the Plan,
- assess the need for new ordinances that are supportive of designated uses,
- actively pursue cooperation with other local governments in a subwatershed planning process,
- ensure there is no significant degradation of water quality within their jurisdiction and
- provide for infrastructure (e.g., sanitary/storm sewers, retention basins, etc.) maintenance and operation necessary to support designated uses.

Implementing organization: County planning commissions/departments

Although considered a local unit of government, county commissions/departments have differing roles from other local governments and, as a result, several departments have been highlighted as implementing organizations.

County planning commissions and planning departments play an important role in implementing this Plan by providing technical assistance to local governments in the preparation and review of various planning documents. The planning commission/department should be encouraged to look for opportunities to include water resource management in their review process and fill a coordinating and educating role within their jurisdiction.

Key responsibilities

- consider water quality implications in reviewing township master plans,
- review township rezoning requests and site plans ensuring the protection of water quality and adequately addressing infrastructure needs,

- actively pursue coordination and cooperation with local governments in a subwatershed planning process,
- implement projects and programs consistent with the Plan and
- provide educational programs to communities consistent with the Plan.

Implementing organization: County drain agencies

County drain agencies play a significant role in a variety of water resource management issues. While their program responsibilities vary by county, they generally have responsibilities for storm water management, soil erosion control, lake levels and review of site plans for new developments. Drain commissions also have the authority to levy special assessments to raise funds for maintaining county drains.

Key responsibilities

- review and comment on local master plans to assess water quality implications,
- review and comment on local zoning ordinances to assess water quality implications,
- ensure that the site plan review process is protective of water quality and adequately addresses infrastructure needs,
- implement projects and programs consistent with the Plan,
- develop and implement storm water management plans consistent with the Plan and
- actively participate in subwatershed management planning consistent with the Plan.

Implementing organization: Local and county road agencies and the Michigan Department of Transportation

Local and county road agencies are responsible for more than 20,000 miles of roadways in Southeast Michigan. In addition, the Michigan Department of Transportation (MDOT) is responsible for approximately 500 miles of state trunk lines in Southeast Michigan. The location, design and maintenance of these roadways have potentially significant water quality impacts.

Key responsibilities

- participate in local subwatershed planning,
- adopt and implement storm water management programs that are consistent with the Plan,
- educate contractors on best management practices to minimize water quality impacts related to construction activities,
- periodically review design and maintenance standards to minimize the impacts of storm water runoff on surface waters,
- review legislation, rules and programs for consistency with the Plan and
- ensure that road construction and management projects are protective of water quality and consistent with the Plan.

Implementing organization: County and local public health departments

County and local health departments are charged with the protection of public health. In carrying out their responsibilities, they have several opportunities to help advocate for the policies in the Plan. Additionally, they often have the opportunity to participate in and facilitate public education on environmental issues related to water quality.

Key responsibilities

- develop ordinances, rules and programs to appropriately manage on-site septic systems,
- develop ordinances, rules and programs to eliminate illicit discharge into storm drains,
- conduct public education projects and programs consistent with the Plan,
- advocate for storm water management plans and participate in subwatershed management planning consistent with the Plan and
- work with subwatershed planning groups in developing monitoring programs for public beaches.

Implementing organization: Subwatershed management groups

It is anticipated that local governments in Southeast Michigan will use subwatershed management groups as a primary institutional arrangement to address storm water permit issues in the future. These voluntary organizations will provide opportunities for local governments to cooperatively develop locally driven watershed management plans intended to meet regulatory requirements.

Key responsibilities

- use the Plan as a basis for identifying measures implemented as part of achieving and maintaining designated uses,
- ensure compliance with storm water permits through:
  - development and implementation of public education and outreach programs,
  - illicit discharge elimination programs,
  - public participation programs,
  - development of storm water management plans and
  - implementation of storm water pollution prevention initiatives.
- identify issues to be addressed on a watershed-wide basis and
- help develop the institutional framework for watershed-wide planning and coordination, as appropriate.

Implementing organization: Publicly owned treatment works and wastewater collection authorities

Publicly owned treatment works (POTWs) and wastewater collection authorities are a key part of the region's water quality management infrastructure. As the owners and operators of sewage treatment plants and collection systems, they have several opportunities to choose strategies consistent with this Plan.

Key responsibilities

- design sewer and plant capacity consistent with the policies of the Plan,
- assess and design operation, maintenance and expansion projects that are consistent with SEMCOG's regional forecasts and the policies of the Plan,
- seek to maximize existing infrastructure before committing to infrastructure expansion,
- coordinate with local governments to assure that infrastructure needs resulting from master plans and zoning ordinances are consistent with the ability to provide services,
- ensure that sewer use ordinances and rules are consistent with the Plan and protective of designated uses,
- actively participate in the developing and distributing of public information programs,
- participate in subwatershed management planning efforts and
- actively seek collaboration with other POTWs in planning and providing service.

Implementing organization: Michigan Department of Environmental Quality

As the chief regulatory agency for environmental protection in Michigan, the Michigan Department of Environmental Quality (MDEQ) is charged with developing, implementing and enforcing a wide variety of water quality protection measures. Michigan's Water Quality Rules, promulgated pursuant to Part 31 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, recognize the importance of the Plan and require that point source discharge permits issued by MDEQ be consistent with the Plan. Administrative Rule 1136, part 21 Wastewater Discharge Permits states, in part, that:

(1) A permit shall not be issued to a person proposing any of the following discharges:
(c) A point source discharge in conflict with an areawide waste treatment management plan or amendments thereto, prepared by a management agency pursuant to section 208(b) of the federal act, unless the commission finds such variance necessary to protect the public health, safety and welfare.

(2) A NPDES permit will not be issued to a person proposing any of the following discharges into waters subject to regulation under the federal act:
(d) A point source discharge in conflict with an areawide waste treatment management plan, or amendments thereto, prepared by a management agency pursuant to section 208(b) of the federal act unless otherwise approved by USEPA.

As part of executing each of these responsibilities, MDEQ has the opportunity to advocate, implement and incorporate the policies of the Plan into its decision-making.

Key responsibilities

- assess National Pollutant Discharge Elimination System (NPDES) permits for consistency with the Plan,
- develop total maximum daily loads (TMDLs) (see Appendix C),

- ensure that the Plan and its policies are incorporated into the state water quality management plan,
- seek statewide consistency in departmental policies, procedures and rules with the policies in the Plan,
- consult with SEMCOG in evaluating major new regulatory programs for consistency with the policies of the Plan,
- give priority and grant funding to projects most consistent with the Plan,
- allocate staff and fiscal resources supportive of policies in the Plan,
- provide technical assistance to local governments and subwatershed planning and
- use the Plan as a benchmark for cooperating with local units of government.

Implementing organization: Michigan Department of Natural Resources

The Michigan Department of Natural Resources (MDNR) is responsible for the conservation, protection, management, use and enjoyment of the state's natural resources. Various divisions within MDNR have legislative, regulatory and program responsibilities that have implications for water quality in Southeast Michigan. These represent opportunities to incorporate the policies of the Plan into its decision-making.

Key responsibilities

- support and implement fisheries and habitat management programs consistent with the Plan,
- provide recreation funding (grants, bonds, etc.) for projects consistent with the Plan,
- develop and implement monitoring programs supporting issuance of fish consumption advisories,
- provide technical assistance to local governments on natural resource conservation issues,
- participate in subwatershed management planning and
- review of programs and projects for consistency with the Plan.

Implementing organization: Michigan Department of Agriculture and Natural Resources Conservation Service

The Michigan Department of Agriculture (MDA) and Natural Resources Conservation Service (NRCS) work closely with the agricultural producers to ensure sustainable agricultural practices, which benefit both the environment and farm community.

Key responsibilities

- advocate for proper use of fertilizers, pesticides and crop management techniques to prevent soil erosion and reduce unsound livestock and manure management practices,
- develop and conduct environmental stewardship and education programs targeted at the agricultural community and
- actively participate in subwatershed planning.

Implementing organization: Michigan Department of Community Health
The Michigan Department of Community Health (MDCH) conducts a wide range of public health programs and provides support and technical assistance to local and county public health departments.

Key responsibilities
- review programs and projects for consistency with the Plan,
- issue appropriate fish consumption advisories and
- support local and county public health department programs consistent with the Plan (e.g., identifying illicit discharges).

Implementing organization: Parks and recreation agencies
Public (local, county, regional and state) parks agencies own and operate a significant amount of land throughout Southeast Michigan. Additionally, there are numerous private recreational facilities across the region, primarily golf courses. Often these facilities, both public and private, are closely associated with a river system and include considerable acreage within floodplains, wetlands and other environmentally sensitive areas. Because of the intense use and management of these resources, there are ample opportunities for these agencies to have a positive impact upon water quality and provide public education programs to citizens.

Key responsibilities
- develop and implement management plans that consider their impact on water resources, with an emphasis on pollution prevention,
- employ environmentally sensitive turf management and landscaping techniques and
- develop and implement public education and outreach programs related to land management practices that have a positive impact on water quality.

Implementing organization: U.S. Environmental Protection Agency
A stated objective of the U.S. Environmental Protection Agency (USEPA) is to be more supportive of community-based environmental programs. The Plan provides an excellent target of opportunity for USEPA to provide leadership with other federal agencies in actively supporting the Plan in several federal programs.

Key responsibilities
- use the Plan as a benchmark for cooperating with local units of government on water quality activities,
- allocate federal agency staff and fiscal resources to support initiatives consistent with the Plan,
- support development and implementation of RAPs, subwatershed plans and lakewide management plans consistent with the Plan,
- help secure fiscal support for Plan implementation,

- facilitate collaboration among federal agencies to ensure actions and decisions are consistent with the Plan and
- give priority to programs and projects most consistent with the Plan.

Implementing Organization: International Joint Commission

The United States and Canada have international agreements related to protecting water resources and the environment. Many of these agreements are under the jurisdiction of the International Joint Commission (IJC), including identification of areas of concern (AOCs) and the development of Remedial Action Plans (RAPs). While the IJC's focus is international, they still have opportunities to advocate for the policies in this 208 plan.

Key responsibilities

- adopt a policy supportive of the elements of the Plan and
- advocate that the policies in the Plan be incorporated into the RAP planning process.

Implementing organization: Watershed councils

Watershed councils are among the most visible advocates for managing and protecting water quality in specific parts of the region. In fact, many watershed councils have historically been very active in water resource management and providing communities technical support. They also provide an excellent opportunity for the public and local community-based groups to actively participate in water resource stewardship. In addition to being advocates for the policies in the Plan, watershed councils should take an active role in identifying and prioritizing the measures necessary to achieving and maintaining designated uses.

Key responsibilities

- provide technical assistance and education to communities for water resource management,
- advocate for projects and programs consistent with policies in the Plan,
- help identify and prioritize projects and programs necessary to obtain and/or maintain designated uses throughout the watershed,
- design and seek funding for projects consistent with the Plan,
- serve as a primary contact point for other citizen/grass roots/environmental organizations within their watersheds and
- advocate, support and actively participate in subwatershed planning.

Implementing organization: Nonprofit/citizen groups

There are a number of nonprofit and citizen groups in Southeast Michigan that have active environmental and water quality programs. These groups provide an excellent opportunity for the public to actively participate in a variety of water quality programs. In addition to advocating for the policies in the Plan, they play a key role in disseminating public information materials and fostering an environmental stewardship ethic.

Key responsibilities

- advocate for projects and programs consistent with policies in the Plan,
- develop and implement public education programs,
- help identify and prioritize projects and programs necessary to obtain and/or maintain designated uses throughout the watershed and
- design and seek funding for projects consistent with the Plan.

Implementing organization: Private sector

The private sector plays a key role in providing for the stewardship of the region's water resources. Companies, large and small, have several opportunities to contribute to the improvement and protection of water quality. These opportunities go well beyond meeting regulatory requirements.

Key responsibilities

- seek opportunities to reduce pollution through pollution prevention and
- support public education and outreach with employees and customers and, when possible, with funding or in-kind services**.**

Implementing organization: Courts/judicial branch

It is recognized that the judicial branch is not responsible for implementing policies in the Plan. However, many decisions made in the judicial process affect, either directly or indirectly, water quality in Southeast Michigan. For example, it is not uncommon for specific water quality projects or issues to be adjudicated at the federal, state or local level. These might relate to sewer infrastructure, wastewater treatment, permits or local land use issues where the resulting decision would impact water quality — either positively or negatively.

In any case, it is important to acknowledge that the numerous implementing organizations identified in this Plan do not fully control their ability to implement their key responsibilities because they are often subject to the results of the judicial process.

Key responsibilities

- recognize the standing of the Plan in the Clean Water Act and in state rules and
- consider consistency of judicial decisions and actions with policies in the Plan.

Implementing organization: Other local, state and federal agencies

There are a number of other local, state and federal organizations who also have a role in advocating for policies in the water quality management plan. These include:

- Michigan Economic Development Corporation,
- County Extension Offices,
- Michigan Hazard Mitigation Coordination Council,

- Federal Emergency Management Agency (FEMA),
- U.S. Department of Transportation,
- U.S. Army Corps of Engineers,
- U.S. Geological Survey,
- U.S. Department of Agriculture and
- U.S. Department of Commerce.

Each one of these organizations should consider making a policy decision that the projects they undertake in Southeast Michigan are consistent with the Plan.

Designated Management System for Areawide Activities

Overview

In general, the water quality management system for Southeast Michigan is a management structure with two major components — one at the local level and one at the regional level. The local component of the management system is comprised of those existing public agencies, units of government and special purpose entities at subregional, county and other local levels that have responsibility for implementing specific provisions of the Plan. The local component consists of three tiers — local governments, subwatershed planning and implementation groups and a watershed coordination mechanism. This three-tiered structure is described in detail in the Watershed Management section of this Plan.

SEMCOG is the entity with responsibility for regional functions. At this level, are the functions of continuing areawide water quality management planning and areawide oversight and monitoring. A description of SEMCOG's role in the management system and in funding arrangements for regional planning and management follow.

This Plan was designed to complement the framework of the laws, regulations, programs and water quality planning efforts of the State of Michigan (see Appendix F). It also recognizes and supports county and municipal water quality management responsibilities and programs and advocates that all of these activities be consistent with the Plan. To the extent that they are consistent with this Plan, SEMCOG endorses, supports and advocates for water quality plans prepared by federal, state, county, watershed and local entities and encourages agencies to endorse and support this Plan. Relationships between SEMCOG, the state and local entities with water quality management responsibilities are described in this section.

Objectives

The following specific objectives provide guidance toward achieving these management goals.

1. Identify institutional arrangements capable of addressing all areas of water quality management.

2. Build upon the structure of existing agencies whose activities, presently or in the future, may impact water quality.

3. Cooperate with local, state and federal agencies to assure that Plan recommendations can be implemented.

4. Provide sufficient flexibility in the management system to ensure that conventional and innovative pollution control measures can be effectively implemented.

5. Maintain areawide water quality planning within the framework of the regional planning organization.

6. Provide for Plan implementation in a manner which recognizes the roles of watershed councils or other locally designated watershed entities in addressing planning and management functions.

7. Encourage comprehensive approaches to local planning and decision making in a manner that takes water quality into consideration.

SEMCOG's Role in Areawide Water Quality Planning and Implementation

Designation

SEMCOG is the Designated Areawide Water Quality Management Planning Agency for Southeast Michigan. Under the Regional Planning Commission Act (P.A. 1945, No. 281), SEMCOG prepares comprehensive regional plans for the seven-county Southeast Michigan area. SEMCOG has ongoing programs in areas of environment, land use, housing, transportation and economic development planning. The Plan is an integral part of this comprehensive regional planning process.

Federal guidelines under which this Plan was originally prepared called for regional oversight, coordination and assurance of Plan implementation. However, responsibility for the overall coordination of waste treatment and regulation of pollution sources rests with the state. SEMCOG lacks authority for regulation and for assuring compliance with this Plan or with state and federal laws. SEMCOG can and does monitor and report on the overall quality of the environment in Southeast Michigan and provides, upon request, coordination and oversight for multi-jurisdictional activities that are consistent with its mission and by-laws. Because of its unique relationship to state and local entities, SEMCOG serves as an information clearinghouse and a conduit for communication between state and local entities and provides the same function among entities at all levels who have water quality planning and implementation responsibilities.

SEMCOG fulfills its responsibilities as the Designated Water Quality Planning Agency for Southeast Michigan through its Environmental Policy Advisory Council (EPAC) and its

Regional Clearinghouse Review Committee (RC2). In fulfilling these responsibilities, SEMCOG utilizes the best available data and assistance from the public and private sector entities responsible for water quality management. SEMCOG serves as an advocate of local concerns at the state and federal levels and as a source of information and technology assistance for implementors of the Plan.

SEMCOG's Planning and Implementation Responsibilities

Environmental Policy Advisory Council

The Environmental Policy Advisory Council (EPAC) identifies and responds to regional issues and local roles involving the quality of the environment, including solid waste disposal with emphasis on waste minimization, water supply, water quality management, storm drainage, air pollution and the relationship of land use to environmental quality. EPAC reports to SEMCOG's Executive Committee.

Key responsibilities:

- assess existing and potential water quality problems,
- prepare inventories and projections (including existing and projected land use inventories, population and economic forecasts and inventories of municipal and industrial wastewater dischargers),
- assess nonpoint source pollution and necessary control needs,
- identify structural and nonstructural storm water management needs,
- identify structural and nonstructural waste treatment system needs,
- identify residual waste control and land disposal needs,
- identify state/local regulatory programs which will be utilized to implement the Plan,
- identify and recommend legislative modifications necessary to implement the Plan,
- identify management agencies recommended for designation by the governor to fulfill each of the provisions of the Plan,
- assess the environmental, social and economic impacts of Plan implementation,

- identify costs and financing mechanisms for continuing planning and implementation activities,

- monitor and report progress toward achieving the Plan's goals and objectives,

- establish an educational strategy designed to meet the goals and objectives of the Plan and direct, as appropriate, toward citizens, technicians and local elected officials,

- recommend Plan modifications to SEMCOG's Executive Committee and

- provide a forum for stakeholders (e.g., watershed councils) to discuss common issues.

Much of the information SEMCOG used in completing these responsibilities is maintained by other agencies in their databases. SEMCOG will only develop new information that is otherwise unavailable or unreliable and then only within the constraints of its mission and financial resources.

Regional Clearinghouse Review Committee

The Regional Clearinghouse Review Committee (RC2) was created in 1974. It consists of local elected officials charged with overseeing SEMCOG's review and comment responsibility for state and federally assisted projects.

Key responsibilities:

- review applications for federal funding for water quality impacts and consistency with regulatory plans and policies; if SEMCOG staff finds an application in conflict with the Plan, the issue is taken before SEMCOG's RC2,

- review and comment on state permits for sewage systems and for discharge to ground or surface waters,

- review and comment on major land use development plans for conformity with the Plan and other regional plans,

- hear and decide upon Plan-related water quality conflicts within 60 days of a request,

- appeals of RC2 decisions may be taken to SEMCOG's Executive Committee; in such cases, the Executive Committee will review the decision and reach a determination within 90 days of appeal.

Plan review and update process

The Plan should be revised so that it remains a meaningful and current document.[4] Periodically, at intervals of no more than five years, SEMCOG will review and, if necessary, revise the Plan.

Based on its activities relative to monitoring plan implementation, SEMCOG staff, with oversight from EPAC, will prepare a report that assesses the implementation of various provisions of the Plan and makes recommendations regarding necessary Plan revisions and amendments. This report will be submitted to SEMCOG's Executive Committee to be utilized in the Plan update process. Based upon the report and other concerns that come to light in the course of implementation, SEMCOG will assess overall progress made toward achieving the Plan's goals and objectives and will prepare appropriate Plan revisions and amendments.

The recommended amendments, prior to approval by SEMCOG's policy bodies, will be made available to local units of governments for comment. The amendments, along with comments obtained from local governmental reviews, will be presented at a public hearing and then acted upon by SEMCOG. The revised plan will be distributed to all relevant persons and agencies including the governor, MDEQ and USEPA.

Financing continuing areawide planning and management

According to federal regulations, the Plan must contain the means for funding the continuing planning and management agencies. Costs for these activities as well as other costs for implementing the Plan must be allocated on a proportionate basis. Federal and state funding for continuing water quality planning and management remains necessary to achieve clean water goals in the lower Great Lakes basin and will continue to be sought. The use of funds to support continuing planning and management will be the responsibility of SEMCOG, according to its adopted work plan and budget.

Accordingly, pursuant to agreements with SEMCOG, Designated Management Agencies (DMAs) responsible for collection and/or treatment of wastewater are required to pay a calculated fee based on the sewage flow generated in the service area for which the DMA has jurisdiction. Such payments provide 80 percent of the regional costs for continuing water quality planning and management. The remaining 20 percent of the regional costs is charged to the seven counties and the City of Detroit based on their respective percentages of the total area within the SEMCOG Areawide Water Quality Planning region.

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[4] 40 CFR §130.6 (e), Update and Certification.

Designated management agencies

As required by federal regulations, SEMCOG, in the original plan, identified those agencies to be recommended for designation by the governor to implement the Plan including, "those agencies necessary to construct, operate, and maintain all treatment works identified in the Plan (Designated Management Agencies or DMAs) and those agencies necessary to implement the regulatory programs."

In addition to these DMAs and regulatory agencies, this updated Plan identifies a number of other entities that also have opportunities and responsibilities for Plan implementation.

Relationship between SEMCOG and the state

In 1980, SEMCOG, working with the MDNR (now MDEQ) and other regional planning agencies in the state, developed a Memorandum of Understanding for water quality management planning in two parts. The first is between MDEQ and the regions, and delineates responsibilities of each in implementing water quality management planning within the state. It also allows the regions to have a role in MDEQ's decision-making process and provides for assistance from MDEQ as funds are available.

The second part of the memorandum is between MDEQ and SEMCOG. This part recognizes SEMCOG's unique nature as the regional agency representing about half the state's population and ensures a closer working relationship between MDEQ and SEMCOG on water quality issues.

SEMCOG will seek an updated Memorandum of Understanding with MDEQ to:

- reaffirm as appropriate, the aforementioned agreements and
- formalize commitments to accomplish responsibilities referenced elsewhere in this Plan.

Relationship between Designated Management Agencies and SEMCOG

SEMCOG will be responsible for initiating dialogue with all agencies with water pollution protection responsibilities identified in the Plan. SEMCOG will provide information and technical assistance to DMAs and will also advocate on their behalf for federal and state assistance, including funding, to help DMAs accomplish their responsibilities.

DMAs will be represented on EPAC as follows:

- one representative each from Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw and Wayne Counties and the City of Detroit and
- one representative of all other DMAs.

The composition of EPAC, including the Designated Management Agency appointments, will be described in the SEMCOG *Reference Manual*.

In addition, prior to each fiscal year, SEMCOG will provide its water quality work program, identifying tasks and their budgets, to the DMAs. At the end of the year, SEMCOG will provide a report indicating projects completed, products developed and progress made on ongoing tasks, along with an accounting of expenditures for water quality management activities.

Watershed Planning and Management

Overview

Watershed planning and management is a primary component of this Plan. This section provides specific details about organizing a watershed planning process and the need to integrate watershed management into stakeholders' decision-making processes.

Initial efforts in water quality management focused on reducing discharges from point sources of pollution such as municipal wastewater treatment plants and industry. The combined efforts of the private sector and governmental units at all levels have resulted in the elimination of millions of tons of pollutant discharges. However, persistent issues remain related to nonpoint sources, infrastructure needs and habitat degradation.

Today's problems require more creative, comprehensive solutions. The current strategy is a more comprehensive approach toward environmental protection that recognizes the hydrology of the system — a watershed protection approach. The premise of this strategy is that many water quality and ecosystem problems are best solved at the watershed level rather than at the individual waterbody, discharger or municipal level (see Figures 5 and 6). Major features of the watershed approach are:

- targeting priority problems,
- promoting a high level of stakeholder involvement,
- integrating solutions that make use of the expertise and authority of multiple agencies and
- measuring success through monitoring and other data gathering.

Related Plan Goals

Of the Regional Goals of the Plan, the following goals have particular relevance for watershed planning and management:

- To foster a watershed management ethic that promotes sustainable development by recognizing the interdependence of natural systems and considers both upstream and downstream impacts of land use decisions.

- To develop an awareness that water quality management needs to be part of a broader ecosystem approach in order to ensure that both impacts and solutions are evaluated holistically and that secondary impacts (unintended consequences) are anticipated and addressed.

Figure 5
Local Units of Government in Southeast Michigan

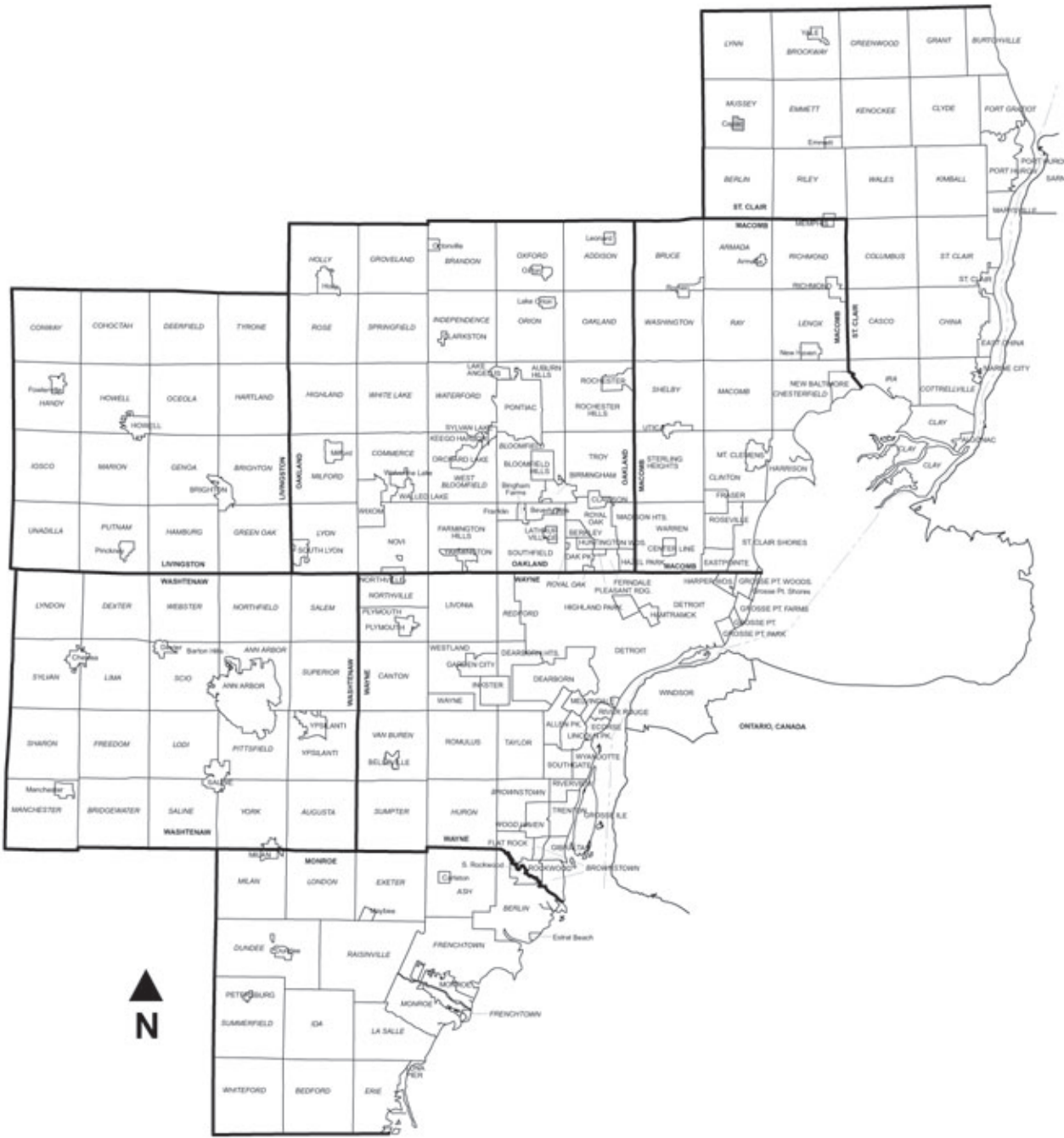
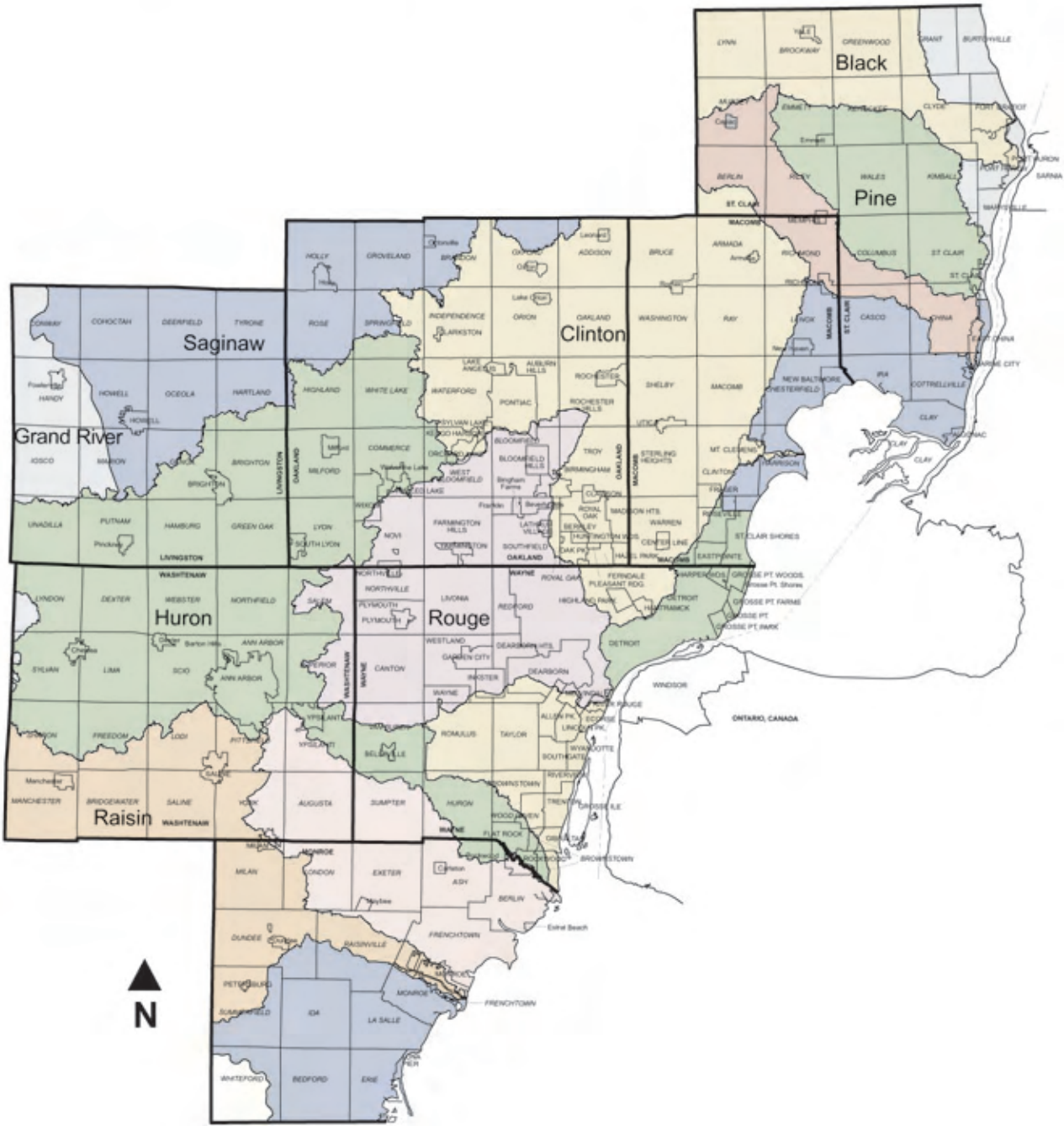


Figure 6
Southeast Michigan Watersheds



- To ensure the development and implementation of laws, programs and practices that prevent the discharge or deposition of toxic pollutants in toxic amounts into the region's waterbodies.

- To promote and support local initiatives for water quality management, including the development of watershed and subwatershed management plans and strategies.

- To ensure the preparation of water quality management strategies that are technically, environmentally, economically, politically and socially feasible.

- To ensure areawide water quality planning is integrated with other planning efforts, including emerging local, regional, state and federal policies and programs geared toward sustainable development.

- To support the development, update and implementation of locally based watershed plans such as the RAPs for the Clinton, Detroit, Raisin, Rouge and St. Clair Rivers, Lakewide Management Plans and subwatershed management plans.

- To facilitate both intra-regional and inter-regional cooperation in addressing water quality issues and concerns.

- To provide a coordinated, efficient and effective management system capable of addressing water quality problems from all sources in an integrated fashion.

- To ensure that equitable ways of allocating the costs of water quality management are established.

Water Quality Planning Coordination

Background

The Plan sets regional water quality goals and objectives, establishes SEMCOG water quality management policy and recommends policies, programs and activities to other parties that have a role in ensuring restoration and preservation of designated uses in Southeast Michigan. Primary responsibility for water quality planning coordination rests with local governments. The Plan is one element in a network of plans, policies and programs in existence or being prepared at the national, state, regional, watershed or community level. Coordination of these efforts is essential for achievement of designated uses in a timely, cost-effective manner.

Policies

SEMCOG, in fulfilling its responsibilities under the Plan, will serve on behalf of local governments as both an advocate and a clearinghouse for federal and state legislation, policy and programs that will contribute to the restoration and preservation of designated uses in the region's waters.

SEMCOG will foster communication, coordination and technology transfer among participants in RAPs, Lakewide Management Plans, watershed council initiatives and watershed and subwatershed plans. SEMCOG will, when requested and when resources permit, serve as a resource to other agencies and organizations engaged in the implementation of water quality plans for the waters of Southeast Michigan.

Communities, businesses, environmental organizations and the State of Michigan should support the development, update and implementation of locally based watershed plans such as the RAPs for the Clinton, Detroit, Raisin, Rouge and St. Clair Rivers, Lakewide Management Plans and subwatershed management plans.

Water Quality Monitoring

Background

The planning for and management of water quality in surface waters and groundwater of Southeast Michigan relies on a variety of decisions made at the local, state and federal levels. This Plan advocates for a watershed management approach which supports decision-making based on subwatershed and watershed plans consistent with the regional plan and all applicable state and federal laws. Effective planning and decision making require pertinent, reliable data gathered in a cost-effective manner and made available in an understandable, timely fashion to decision makers. Water quality monitoring focusing on specific objectives, such as identification of effects of wastewater outlets to storm drains, aimed at attaining beneficial uses of the waterbodies in Southeast Michigan will provide the type of data needed. Prior to 1998, the state conducted a number of water quality programs, but they were based on monitoring chemical parameters for compliance with site specific standards or criteria and did not take into account nonpoint sources of pollution. This approach is insufficient for comprehensive watershed management. Although MDEQ has developed a monitoring strategy, funding limitations have prevented its full implementation.

Policies

State and local governments and other appropriate agencies should cooperatively establish monitoring programs to support the achievement of designated uses through

subwatershed and watershed management plans. MDEQ should provide technical support and guidance in the development of these programs. The monitoring programs should focus on the following:

- The monitoring programs should be sufficiently comprehensive to ascertain physical, chemical and biological characteristics and trends.

- They should be specific to each watershed plan and should be designed to meet the objectives of that plan.

- The parameters selected for collection and analysis should be those relevant to the Plan objectives and collected at such locations and with such frequency and quantities as will provide:
  - sufficient information to determine the overall health of the water system,
  - permit evaluation of progress toward Plan objectives and
  - meet any minimum compliance requirements for applicable permits.

- Monitoring programs should be responsive to community needs, as stated in the Plan, and be cost effective. Participants in the monitoring plan can include the state, local governments, universities, consultants, permitees and volunteers.

Volunteer monitoring efforts provide relevant data and stewardship opportunities. These programs should be encouraged and focused on monitoring habitat, macroinvertebrates and amphibians, as well as such performance indicators as improved aesthetics and participation in recreational activities.

The state should support monitoring programs designed to identify illicit discharges to storm drains.

In order to protect the habitat of Southeast Michigan, the state and communities should support and implement fisheries and habitat management programs consistent with the Plan.

The state should implement a monitoring program designed to adequately assess the quality of our region's resources, including developing and implementing a monitoring program to support issuance of fish consumption advisories.

Data gathered in the monitoring program should be readily available to decision makers and the public in appropriate quantities and formats including, digital databases and, where possible, on the Internet.

SEMCOG should advocate for sufficient funds from appropriate sources for needed monitoring programs.

In order to focus available resources and gather relevant information, all monitoring programs should consider utilizing environmental indicators as part of their program, which should be developed in the subwatershed management process.

SEMCOG will also advocate for funding to create a comprehensive program to monitor concentrations of toxic compounds in the atmosphere. That program should be based on several factors, including evidence gathered in sediments, fish tissue sampling, information available in the Toxic Release Inventory, reports developed as part of the Great Waters Program in the federal Clean Air Act, experience in other states and policies incorporated in international and interstate agreements.

Watershed Management

Background

MDEQ has the ultimate responsibility for ensuring water quality standards are achieved. Nonetheless, key responsibilities for implementing measures necessary for surface water quality protection resides with local governments. But, neither watershed boundaries nor water quality and quantity pollution problems coincide with municipal jurisdictions. Because the actions of one community may have either beneficial or deleterious effects on neighboring communities, it is imperative that a multi-community approach to water quality management be identified and utilized. To be successful, the system of watershed management must reflect both natural systems and local government cooperation.

There is general recognition that the watershed is the appropriate geographic area for addressing surface water quality protection. Planning and management at the watershed level is necessary to ensure that appropriate upstream and downstream activities are coordinated to most efficiently and effectively address water quality concerns unique to that watershed. The sheer size of many watersheds in Southeast Michigan, as well as their political and land use diversity, often slows or impedes watershed-wide management. As a result, subwatersheds are often a more manageable unit for organizing water quality restoration and maintenance programs. Still, subwatershed planning and implementation activities ultimately must be accomplished in a manner consistent with a watershed management plan.

The term watershed management encompasses planning and implementation of activities to protect water quality and control water quantity. Watershed planning includes at least the following:

- establishing watershed goals,
- monitoring water quality and quantity,
- identifying pollution and flooding problems,
- identifying and developing remedial and preventative programs, plans and/or measures to eliminate or mitigate pollution and flooding problems and
- identifying appropriate agents and funding sources to implement remediation and mitigation measures.

Watershed implementation measures include at least the following:

- constructing pollution and flood control equipment and structures,
- identifying municipal and private sector best management practices,
- identifying agricultural, livestock and manure best management practices,
- identifying project administration and funding and
- promoting education programs.

Watershed management is a complex and dynamic process involving a great number of public and private entities. Planning and implementation are the responsibility of several entities, including local, state and federal governments and agencies, as well as subwatershed groups, watershed entities and regional agencies.

An effective watershed management system that achieves and sustains designated uses of the region's surface waters will provide clear goals and definitions of roles and responsibilities. The system should be designed to accommodate individual participants' strengths and limitations, eliminate duplication of effort and avoid overlap of responsibility. The system should include an identified mechanism for integrating the various activities of several organizations into an effective and efficient watershed protection program. To facilitate local government implementation of these responsibilities in a system that recognizes the multi-jurisdictional nature of watershed management, a three-tiered approach is the preferred model for watershed management.

The purpose of this three-tiered structure is to:

- assure that the many water quality protection measures that can be accomplished by individual local units of government move forward,
- provide a forum for coordinating multi-jurisdictional issues at a manageable size (subwatersheds) and
- provide for development of a comprehensive, watershed-wide program that meets water quality uses and the needs of local governments.

Under this three-tiered approach, watershed management is a dynamic process. Activities within local governments will affect subwatershed efforts. Subwatershed work will impact the watershed-wide activity. The watershed-wide work will impact local government activities.

While all three tiers will be desirable in most cases, there are foreseeable situations in which the activities in one or two tiers will be sufficient to address water quality problems.
Tier One focuses on those activities which can best be accomplished by individual local units of government or other organizations with limited coordination with other agencies. This may include activities such as regulatory compliance, implementation of local programs and enforcement of local ordinances.

Individual communities and public and private agencies have primary responsibility for ensuring that planning and implementation of the various remedial and preventative actions identified occur within their jurisdictions. Local government ordinances which regulate private development should be protective of water quality and quantity.

Tier Two focuses on bringing together groups of communities and agencies to undertake activities requiring multi-jurisdictional cooperation. Subwatershed implementation groups should be formed, with membership made up of individual communities and public and private agencies, especially watershed councils. These groups should be responsibile for completing subwatershed management plans that identify goals and alternative actions to meet those goals. The subwatershed plans should also define arrangements for coordinating activities among communities and agencies in the subwatershed.

Tier Three focuses on bringing together subwatershed implementation groups to coordinate and address issues and activities on a watershed-wide scale. The need for this level of coordination will vary among watersheds and will evolve as needs are identified through the subwatershed coordination process.

In most cases, comprehensive watershed-wide coordination is essential to successful watershed management. Communities and agencies within a watershed need to determine how they will accomplish those activities which must be addressed for the entire watershed. Examples of these activities include the following:

- reviewing subwatershed plans for consistency,
- providing for integration, coordination and sharing of information,
- providing advice on distribution of grant funds,
- identifying a mechanism for dispute resolution and
- establishing new mechanisms to address unresolved issues using existing institutions of government.

Policies

Watershed management must be built on partnerships identified and designed by local governments. Local governments should exercise their responsibility for water quality protection by engaging in watershed and subwatershed planning and implementation. To facilitate local government implementation of these responsibilities in a system that

recognizes the multi-jurisdictional nature of watershed management, the above described three-tiered approach is the preferred model for watershed management.

Subwatershed implementation groups should be formed, with membership made up of individual communities and public and private agencies, especially watershed councils. These groups should be charged with responsibility for completing subwatershed management plans that identify goals and alternative actions to meet those goals. The subwatershed plans should also define arrangements for coordinating activities among communities and agencies in the subwatershed.

Comprehensive watershed-wide coordination is essential to successful watershed management and must be designated by, and accountable to, local governments and other entities within the watershed, consistent with local home rule. Communities and agencies within a watershed need to determine how they will accomplish those activities which must be addressed for the entire watershed.

The areawide coordination mechanism used in the federal Transportation Equity Act for the 21st Century (TEA-21) should be considered a model for watershed-wide coordination. In this system, watershed coordination would facilitate development of watershed-wide goals and objectives. In addition to other benefits, this coordination mechanism would help ensure that subwatershed activities are consistent with those goals and objectives (See Appendix B).

SEMCOG will provide information and technical assistance to all levels of the watershed management system. If requested by watershed stakeholders, and as resources permit, SEMCOG will provide the coordinating function among watersheds and subwatersheds in the region, provided that requested activities are consistent with its by-laws.

Water Quality Trading

Background

The use of market-based incentives to achieve water quality benefits has long been discussed in academic and regulatory circles as a cost-efficient means of reducing pollutant loadings. Putting these incentives into practice has been problematic, especially because they have to be superimposed on a complicated structure of state and federal laws. Another impediment to these incentives is skepticism that a market-based incentives program could even work and concern that if it did work, it would lead to backsliding. However, a water quality trading program can be designed to ensure that each trade includes a net benefit to the environment, thus leading to pollution reductions that would not otherwise occur under the “command and control” approach of the existing national pollutant discharge elimination system (NPDES) permit program.

The following framework for a water quality trading program will achieve this additional environmental benefit within the context of a voluntary, market-based program.

- Water quality trading cannot be a substitute for meeting environmental regulations. Trading can provide additional opportunities to more cost-effectively achieve compliance and assist in identifying and implementing watershed strategies to water quality management.

- A specific portion of all the credits generated must be retired prior to the sale of the credits. Under certain circumstances, additional credits must be retired by the user. Also, the MDEQ should retain the right to review all trades and disallow any use of credits that could potentially result in a localized water quality problem.

- Credits could only be used within the same watershed in which they were generated, so as not to improve the water quality of one system at the expense of another.

- Trading should be limited to nutrients and conventional pollutants. However, cross-pollutant trading, use of banked credits, seasonal trades and other types of trades would require prior MDEQ approval. The trading of bio-accumulative chemicals of concern (BCC) and other toxic substances should not be permitted.

- In order to achieve maximum benefit and flexibility, the trading program should allow for the generation and use of credits by urban, rural and agricultural sources and both point and nonpoint sources.

Policies

Public and private entities in Southeast Michigan should consider water quality trading as another mechanism for achieving, protecting and maintaining designated uses of surface waters, consistent with the following principles:

- Credits should not be used if it results in a localized water quality problem.

- Water quality trading should not be used to avoid compliance with the Clean Water Act.

- Credits should be used to meet water quality limits, but not to avoid having limits established.

- There is a net environmental benefit gained by each trade through the retirement of a portion of all credits generated. This benefit should be over and above that which existing programs would realize.

- Land-based pollution prevention activities should be implemented to generate credits.

- Unpermitted nonpoint sources should use models to estimate reductions in pollutant loadings and account for uncertainty in the modeling process through an increase in the required retirement credit.

- The use of credits should be limited to the watershed where they are generated.

- Public agencies and local governments should generate and use credits as a means of cost-effectively achieving, protecting and maintaining designated uses of Southeast Michigan's surface waters.

- Seasonal use of credits should be limited to prevent problems associated with nutrient loadings during the summer months.

- Any trade where a lake, pond or impoundment is downstream of the user or within a non-attainment area should include the retirement of additional credits to ensure that a greater environmental benefit is achieved.

Environmental Indicators

Background

The need for monitoring and tracking the condition of the region's water resources is an essential, but often complex and costly undertaking. One way to fulfill this need is to develop understandable measures, or indicators, that provide information to support decision makers in allocating limited resources. While water sampling data is a key indicator, it is often considered the only information that needs to be collected and tracked. However, other indicators also provide critical information for assessing the adequacy of progress in achieving and maintaining designated uses. One familiar analogy is from economic indicators. Interest rates, stock indices and unemployment rates are all examples of information collected to help gauge the current and future condition of the economy. Just as no single indicator can measure the condition of the economy, no single indicator (e.g., water monitoring data) accurately reflects the condition of water quality.

Indicators can present information on status or trends in the condition of the environment and can measure pressures that degrade water resource quality. One example is the

amount of current impervious surface in a community or watershed. Another example is the expected increase in impervious surface that might be expected given local zoning and master plans. Additionally, by utilizing indicators to illustrate ecosystem health, communities can reduce the cost of a complex monitoring system.

Information gathered for specific indicators can be utilized by many stakeholders, including citizens, subwatershed planning groups, communities, businesses and environmental organizations. Therefore, when selecting indicators, it is important to choose measurements that are valid, usable and understandable by all these potential audiences.

Various organizations have implemented indicator programs, and their methodology can be useful when developing indicators for a specific stakeholder area. The USEPA has developed a set of 18 environmental indicators that measure progress toward national water goals and objectives. SEMCOG has also developed *A Profile of Southeast Michigan's Environment*, utilizing various indicators to assess the quality of the environment in Southeast Michigan, including air, water and land. A third example is the Rouge Report Card prepared by the Rouge RAP Advisory Council, which presents 18 indicators in an easily understandable format.

Policies

In order to maximize resources and gather comprehensible information to support decision-making and implementation, subwatershed planning groups need to identify specific environmental indicators as part of their planning process.

To enhance this program, the following questions should be considered when selecting an indicator:

- Is it understandable by the community?
- Does it reflect changes over time?
- Does it reflect the unique characteristics of the study area?

Information derived from indicators should be used by communities and state and federal agencies in formulating environmental protection laws and regulations and in developing resource protection and education programs.

Nonpoint Source Management

Overview

With point sources of pollution under more effective control, nonpoint sources have emerged as a principal contributor to surface water pollution in the nation today. To address this, communities with a population over 100,000 living within a separate storm sewer area require a storm water permit. In addition, construction sites over five acres must also receive a NPDES storm water permit. However, this permit system has not totally alleviated the problem of nonpoint source pollution.

Wayne County's Rouge River National Wet Weather Demonstration Project and other projects from around the nation, indicate that more reductions in nonpoint source loadings are needed to achieve designated uses. As a result, the USEPA has extended the national pollutant discharge elimination system (NPDES) storm water program to cover smaller communities and construction sites under five acres. This rule will cause approximately 125 Southeast Michigan municipalities to obtain a NPDES permit to cover their storm water discharges (see Figure 7).

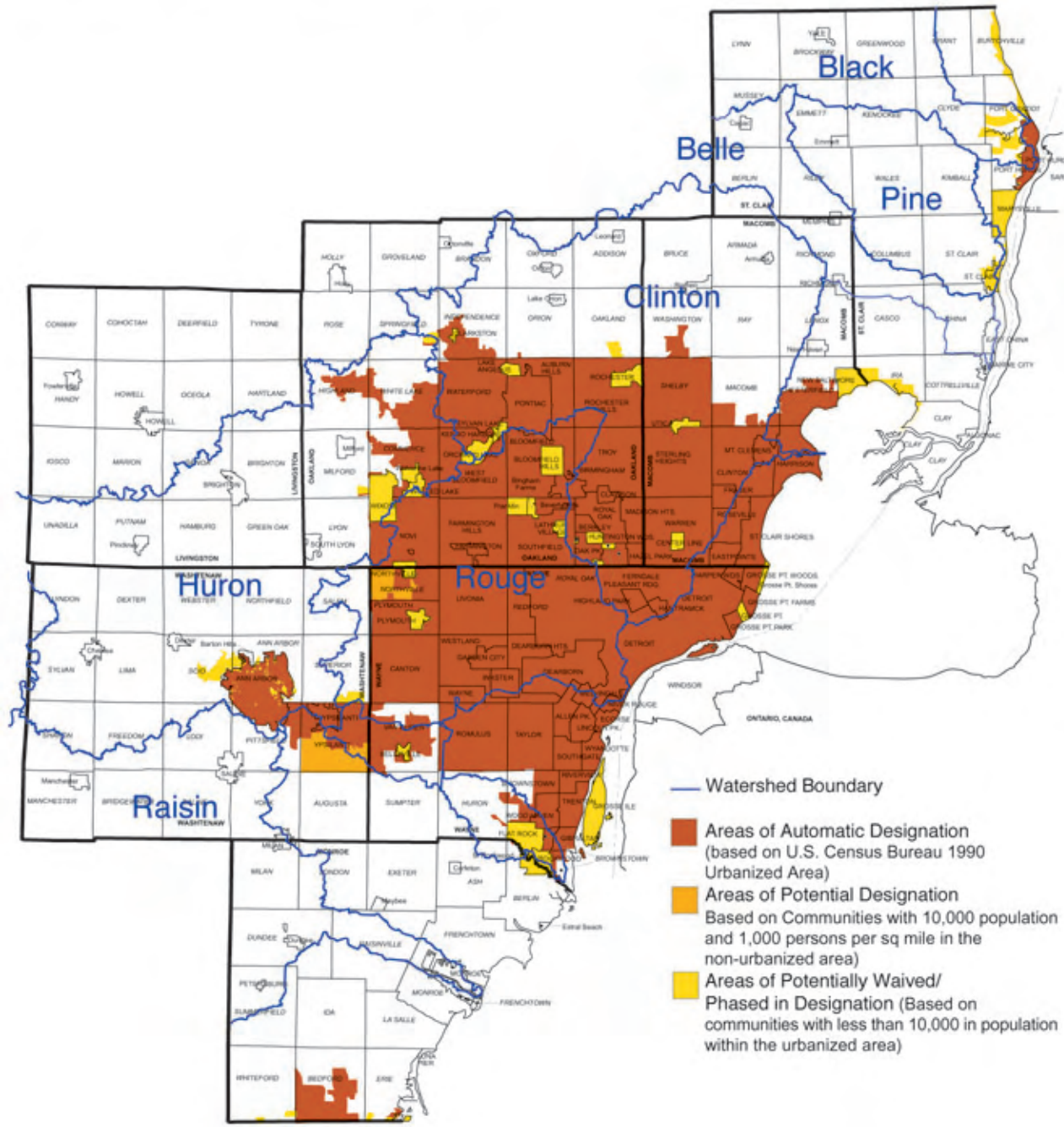
The State of Michigan has independently established a voluntary general storm water permit, which is expected to satisfy the requirements of the federal permit program. The general storm water permit approach offers communities the opportunity to establish their own priorities, propose their own schedules and integrate storm water management practices through a series of iterative steps. It allows local units and their partners to develop a plan of action that best meet the needs of the community while making measurable progress toward restoration of the river. Following are some of the key provisions of the general storm water permit:

- developing and implementing public education and outreach programs,
- developing and implementing illicit discharge elimination programs,
- developing and implementing public participation programs,
- developing storm water management plans and
- implementing of storm water pollution prevention initiatives.

Related Plan Goals

Of the Regional Goals of the Plan, the following have particular relevance for nonpoint source management:

Figure 7
Storm Water Phase II Rule:
Areas of Designation in Southeast Michigan



- To prevent new and reduce existing negative water quality and quantity problems from nonpoint sources to achieve and maintain designated uses.

- To ensure the provision of structural and non-structural pollution control measures, including pollution prevention and considering impacts on fragile natural resources while respecting public and private property rights.

- To ensure that the regulation, location, modification, construction and operation of any facilities, activities or substantive changes in use of the lands, which might result in any new or deleterious discharge directly or indirectly into the region's waters, are undertaken in a manner that promotes sustainable land use or development patterns.

- To ensure the development and implementation of laws, programs and practices that prevent the discharge or deposition of toxic pollutants in toxic amounts into the region's waterbodies.

- To promote and support local initiatives for water quality management, including the development of watershed and subwatershed management plans and strategies.

Pollution from Storm Water Runoff

Background

As a result of rain events and snow melt, storm water runs off through sewers or over land and drains into streams, carrying with it a variety of pollutants. Impervious surfaces such as roads, parking lots and buildings increase the rate and volume of storm water runoff and impact all parts of river systems with increased flow and pollution loads. Headwater areas are extremely important to the health of the overall river system and merit special attention in this Plan.

Storm water management includes the design and implementation of structural and non-structural pollution control measures. The purpose of these measures is to control both the water quantity and water quality impacts of runoff so that typical storm water discharges do not result in adverse stream impacts.

Maintenance is another critical element of effective storm water management. Once a program or project is established, proper maintenance is critical to ensure that benefits remain effective.

The nature and extent of pollutant loadings from storm water vary by land use category. For example, different levels of impervious surface coverage are associated with different

land uses. Higher levels of imperviousness are found in existing built-up areas; lower levels of imperviousness are found in the rural/agricultural areas. The remedies for reducing these loadings vary by land use type.

For purposes of this Plan, storm water runoff in Southeast Michigan can be differentiated by three major land use categories which are all present in Southeast Michigan — existing/built-up development, developing areas at the suburban fringe and rural/agricultural areas. A sub-category, "redeveloping areas," may be found within built-up areas.

In existing/built-up areas, reductions in storm water impacts generally can be achieved by:

- removing pollutants from land surfaces through such practices as street sweeping, leaf pick-up and winter road snow and ice management practices,
- preventing pollution of land surfaces from fertilization and improper waste oil disposal,
- educating, detecting and eliminating illicit discharge,
- slowing storm water runoff overland or through drains by downspout disconnection,
- diverting runoff over unpaved surfaces and
- retrofitting storm drainage systems to treat storm water discharges.

Redeveloping areas provide opportunities to design new development with reduced impervious surfaces and improved drainage to achieve reductions in storm water impacts.

In developing/suburbanizing areas, preventative and remedial practices for storm water pollution control for built-up communities are also appropriate for built-up portions of developing suburban areas. But, more visionary, comprehensive storm water management planning is needed in these developing areas to avoid some of the negative effects of past practices. Communities experiencing growth and development can use storm water management plans to guide them in incorporating prevention measures into their comprehensive planning, zoning and development review procedures. Several measures need to be addressed, including open space planning, stream corridor preservation, use of open swales and drains, wetlands protection, compact development, use of pervious paving materials and reducing pavement width and parking standards.

In rural/agricultural areas, there are relatively small amounts of impervious surfaces. However, they can still be a source of water quality impairment without adequate land management. Improper use of fertilizers and pesticides, over-tilling, crop management techniques which result in soil erosion and unsound livestock and manure management are all practices that result in significant stream degradation from rural/agricultural lands. Careful fertilizer and pesticide monitoring and application practices, conservation tillage practices and protective fencing and/or buffering of surface waters to prevent animal entry

are just a few of the measures that can be employed to reduce pollutant loadings from agricultural lands.

Although not an immediate cause of stream degradation, activities such as removing land from agricultural production, splitting and subdividing agricultural land and open space for more intensive development and introducing of infrastructure such as roads and water and sewer systems can result in adverse, long-term impacts on water quality and must be addressed.

Policies

Surface water degradation from storm water runoff in Southeast Michigan must be prevented or significantly reduced as part of the overall strategy for achieving and maintaining designated uses of the region's surface waters. Communities are responsible for the quality and quantity of storm water that is generated within — and leaves — their jurisdiction. Communities should work together and with other agencies, such as road commissions, planning departments and drain commissions in developing watershed management plans that can serve as guidance for incorporating best management practices into zoning, site plan review and other review mechanisms.

In their plans, communities should identify a combination of preventative and remedial measures that take into account the land and water features within their jurisdiction. The primary goal in designing these measures is to control runoff rates, volumes and pollutant loadings to levels that result in achieving and/or preserving designated uses of surface waters within the community's jurisdiction, as well as avoiding negative downstream impacts.

Measures to control stream degradation should be conducted in a manner consistent with adopted multi-community watershed and subwatershed plans. SEMCOG should work with other agencies in providing information and technical assistance to communities, with special emphasis on those experiencing rapid growth in the headwaters areas of the region. SEMCOG should also advocate for legislation and programs that assist local governments in effective and efficient storm water management.

In order to help facilitate cooperation in watershed planning, communities served by separate storm systems should apply for the State of Michigan general storm water permit.

Erosion and Sedimentation

Background

Sedimentation occurs when wind or water runoff carries soil particles from an area (e.g., a construction site or farm field) and transports them to a waterbody. Excessive

sedimentation leads to impairment of designated uses. It seriously impacts the fishery and food chain by burying eggs and bottom-dwelling species and interfering with light penetration and photosynthesis, disrupting the water ecosystem. Sediment from construction sites can reduce water depth and increase water temperature. In addition, other pollutants such as phosphorus, pathogens and heavy metals are often attached to soil particles and deposited in the waterbodies with the sediment. This erosion and sedimentation process results in diminished use of the water resource for recreation and commercial uses, and increased public expenditures for clean out of drains and navigation channels.

Michigan's Soil Erosion and Sedimentation Control Act (PA 347 of 1972, now Part 91 of the Natural Resources and Environmental Protection Act --- PA 451 of 1994), established a program to control soil erosion from most land use earth change activities. Permits are required for activities within 500 feet of a lake or stream or that disturb an area of one or more acre in size.

The program is generally administered by county and local enforcing agencies. MDEQ oversees all programs, conducts training and certification programs and audits local program performance.

While efforts to control sedimentation of waterbodies to protect designated uses have not been systematically evaluated, there is considerable concern that some impairment is caused by excessive sedimentation. As of writing this Plan, legislation strengthening Part 91 is under consideration.

Policies

Public education on the benefits of erosion control and how to recognize and report noncompliance are needed to assist local communities in implementing an effective erosion control program.

State and federal agencies need to provide technical assistance to support the work of the local enforcing agency, businesses and farmers utilizing erosion control techniques.

For legislative and regulatory programs to be successful, adequate funding and personnel are needed to evaluate the effectiveness of erosion control techniques' and perform inspections.

Existing permit programs for mitigating erosion and sedimentation from construction sites need to be evaluated to assure adequacy of the program.

Communities have several opportunities to ensure that sedimentation control is effectively achieved through the following actions:

- Communities need to ensure plans for erosion control are feasible and sensitive areas are not disturbed as part of the site plan review process.

- Communities need to verify that the soil erosion control permit has been issued and the required best management practices are installed before issuing the local construction permit.

- Upon completion of construction, local communities need to assure that all erosion control permit requirements have been satisfied before issuing the local occupancy permit.

- Communities need to increase inspections on active construction sites. Local inspectors visiting construction sites for other purposes can be cross-trained to recognize and report noncompliance with the erosion control provisions.

To prevent sedimentation and soil loss from agricultural areas, farmers need to utilize various types of buffer strips to effectively mitigate the movement of sediment, nutrients and pesticides from farm fields.

Maintaining a strong buffer system and reducing the amount of impervious surfaces around the water resource is imperative in reducing streambank erosion and should be incorporated in local planning processes through such mechanisms as overlay zoning.

On-Site Disposal Systems

Background

The vast amount of domestic wastewater in Southeast Michigan is treated at municipal wastewater treatment facilities.

However, a significant amount of the region's population continues to reside in areas served exclusively by on-site disposal (septic systems). While some of these systems are considered temporary because municipal sewer service is expected to be available in the near future, many other on-site systems are permanent.

When properly sited, constructed and maintained, septic systems can provide an effective method of wastewater treatment. In reality, septic system failure is very common, resulting in several adverse impacts including contamination of groundwater supplies, health risks from the ponding of wastewater on surfaces above failed systems and the migration of insufficiently treated wastewater into surface water. Much of the pollution resulting from on-site disposal systems is believed to be attributable to a lack of implementation and enforcement of proper maintenance. This must be addressed with institutional changes.

Some experts contend that even well maintained on-site disposal systems eventually fail. This requires either replacement with a new on-site system or connection to a municipal wastewater treatment system.

Proper maintenance of an on-site system requires regular pumping and disposal of septage. Septage, the waste from septic systems, is generally a more concentrated form of waste than sewage, often containing higher levels of pathogens and chemical contaminants which are released to the system by homeowners and businesses. This higher potency of septage raises concerns about the method of disposal. Currently, septage is legally disposed of in either wastewater treatment plants (WWTPs) or at state regulated land application sites. However, many WWTPs in Southeast Michigan have either refused or restricted the disposal of septage into their waste streams. Concerns with septage disposal include:

- potential for exceedance of NPDES permits at WWTPs that accept septage,
- potential for human and environmental health impacts to the workers, groundwater and crops at land application sites from heavy metals and pathogens,
- winter-time application problems which can lead to ponding of septage, runoff and contamination of surface waters and
- illegal road-side disposal of septage.

Ultimate responsibility for regulatory wastewater disposal using on-site systems rests with the state. However, much of that responsibility has been delegated to county and local levels of government. This shared responsibility, while providing some efficiencies, has been cited as one of the underlying reasons for pollution problems stemming from failing on-site systems across the state.

Although proper siting and installation are crucial to the success of on-site disposal systems, failure to properly maintain the system by the property owner is considered the major cause of system failure and the resulting environmental degradation.

Protecting groundwater, surface water and public health from septic system failures requires clearer delineation and implementation of regulatory responsibility. Better cooperation among state, county and local levels of government to ensure proper siting, installation and inspection of on-site systems and providing education and incentives to effect a greater level of property owner maintenance is essential.

Policies

A statewide on-site disposal system management program is needed that clearly delineates regulatory responsibilities for siting, installation, inspection, septage disposal and enforcement of applicable codes and ordinances. To develop this strategy, the State of Michigan should work with a task force of county sanitarians and local officials including representatives of the Southeast Michigan county health directors and the Michigan Septage Haulers Association. Gaps in the regulatory scheme should be identified by the task force, along with recommended legislation to remedy inadequacies.

In developing a statewide on-site disposal system management program, the following issues must be addressed:

- adequate fees (i.e., fees that cover the real total costs of contamination),
- safe and effective options for year round disposal,
- pretreatment and testing for contamination and
- training programs for certification of septic system installers and inspectors.

To be effective, a statewide on-site disposal system management program needs a stable funding source(s). Revenues should be derived mainly from septage generators. Options for revenue sources include a fee on permits for installation and repair of systems and a proposed fee increase on a septage hauler's license.

Siting of septic systems should be an integral part of a community's land use planning and zoning process. Communities should identify areas within their borders where septic systems would be prohibited or limited in extent, including areas that are unsuitable for on-site systems and those areas that the community wishes to designate as permanent open space. Community ordinances should establish minimum lot size requirements for on-site systems. In areas where on-site systems are expected to be permanent, ordinances should provide for separation of the on-site systems from waterbodies and other natural resources and from property set aside for alternate septic fields.

County health departments should take into account local planning and zoning provisions when determining the suitability of a property for an on-site wastewater disposal system.

Proper maintenance of on-site systems is essential to attaining and protecting sustainable uses. Communities should select from a variety of options for assuring proper maintenance. These include, but are not limited to:

- septic system maintenance districts or
- annual licensing based on proof of inspection or maintenance.

Illicit Discharges

Background

Discharges to the storm sewer system, surface or groundwater that should be connected to a sanitary sewer are considered illicit. Illicit discharges impair designated uses by allowing untreated wastewater to be discharged to waterways. Flows from illicit discharges often include such pollutants as raw sewage, heavy metals, oil and grease, detergents, chlorine and nutrients.

Most illicit discharges are the result of an improper plumbing connection which allows the discharge of wastewater to a storm sewer system. A typical example of an illicit connection is a cross-connect of a floor drain to the storm sewer in an auto-repair facility. However, the Michigan General Storm Water Permit includes discharges from failing on-site septic systems in the definition of illicit discharges. (For a more detailed discussion of failing on-site systems, see the On-Site Disposal System policies located in this section.)

Policies

Municipal building departments should ensure that building inspectors are adequately trained to recognize plumbing cross connections during the construction phase.

Environmental health departments should work with owners and operators of separate sewer systems to develop and implement illicit discharge identification and elimination programs.

Groundwater

Background

The water resources of Southeast Michigan include considerable quantities of groundwater. Many residents of Southeast Michigan rely on groundwater for their drinking water supply. Groundwater is also used for irrigation, extractive operations and other industrial uses.

The original water quality management plan was one of the few in the country that addressed groundwater protection. At that time, major sources of groundwater pollution included failing septic tanks (including contamination from household products), leachate from landfills, leaking underground storage tanks, wells, the disposal of chemical and industrial waste on land surfaces (brownfields) and nonpoint sources of pollution such as excessive use of road salt for de-icing.

In the 20 years since the Plan was first adopted, Michigan adopted numerous laws and regulations to provide for groundwater protection. These laws focus on many of the major

sources of contamination described above. Also, the implementation of a variety of funding programs providing incentives to communities and the private sector to remove groundwater pollution has resulted in improvements to the resource. Some examples follow.

- State legislation and regulations (including design criteria) to control groundwater contamination from solid waste landfills (P.A. 451 of 1994, Part 115).

- Legislation and rules mandating a regulatory mechanism for cradle-to-grave management of hazardous waste (P.A. 451 of 1994, Parts 111).

- Legislation and regulations providing for removing leaking underground chemical storage tanks and setting strict standards for new facilities. (P.A. 451 of 1994, Parts 211, 213 and 215)

- New enforcement tools and financial assistance programs that provide strong incentives for the cleanup of contaminated sites and promote economic development in previously depressed areas (P.A. 451 of 1994, Part 193, 195, 196).

The two remaining major sources of groundwater contamination are failing or improperly located septic systems and pollution from nonpoint sources and are still significant regional issues. Both of these groundwater threats are dealt with extensively in other sections of this updated Plan.

Some previously unregulated sources of groundwater contamination will be addressed by a new permit system to deal with storm water runoff. Michigan has established a voluntary permit system which satisfies the requirements of the federal permit program. Whether under the Michigan voluntary storm water permit or the federally mandated permit, over 100 communities in Southeast Michigan will be implementing new programs to reduce pollutant loadings from storm water runoff.

Policies

Groundwater protection should be incorporated into community zoning, site plan review and master planning processes. To support this activity, communities should perform the following functions:

- inventory existing and potential sources of groundwater contamination as well as areas of groundwater recharge,
- identify current and future areas dependent on groundwater,

- reduce impervious surfaces to allow for infiltration to replenish groundwater supplies and
- identify other measures needed to protect groundwater resources.

Communities, watershed councils and various other stakeholders should educate citizens dependent on groundwater about how their actions can affect groundwater quality (through nonpoint source pollution).

State and federal agencies should continue to support groundwater protection by providing both fiscal and technical resources to communities, watershed councils and other stakeholders undertaking educational and wellhead protection programs.

MDEQ should ensure that fiscal resources are available to properly enforce laws and regulations. The enforcement goal should be compliance with state laws and regulations, not penalties after the contamination has occurred.

Local governments, county health departments and MDEQ should assess the adequacy of existing programs to properly close unused or abandoned wells.

In order to reduce nonpoint source pollution, which often results in groundwater contamination, communities in Southeast Michigan should apply for coverage under the Michigan voluntary general storm water permit.

Contaminated Sediments

Background

Many pollutants which have entered the region's waters have settled out among sediments. Much of this pollution is from industrial activities that occurred prior to the enactment of federal and state environmental legislation. Of greatest concern are those pollutants that inhibit designated uses and have been identified as critical materials by USEPA and/or the state, pollutants identified in RAPs or other reliable studies and pollutants that exert an excessive biochemical oxygen demand in the aquatic environment. Remediation of contaminated sediments can be extremely costly and beyond the financial resources of local governments.

Policies

The State of Michigan, impacted localities and other appropriate parties should cooperate to prioritize and remediate known areas of contaminated sediments which impair designated uses. Remediation measures for these sites, which may include removal or insitu techniques, should be identified in appropriate planning documents along with identifying of parties or agencies responsible for remediation, the cost and timetable.

Of equal or greater importance is identifying active sources of pollution which result in contaminated sediments and implementing appropriate measures to control these sources. Care should be taken in the remediation of contaminated sediments that public health and environmental resources are protected. SEMCOG will advocate on behalf of local governments for state and federal financial assistance to remediate contaminated sediments that impair beneficial uses in Southeast Michigan.

Atmospheric Deposition

Background

Since major progress has been achieved in controlling discharges from point sources, the contribution to water pollution from other sources is now a greater concern. One of those sources is atmospheric deposition.

Many changes have occurred since the last update of the Plan. Some of these changes were not specifically targeted for water quality improvement. Nonetheless, long-term water quality benefits are expected to result from these actions, which include:

- instituting a major program under the federal Clean Air Act to reduce emissions of sulfur oxides and nitrogen oxides to mitigate the impacts of acid deposition,
- instituting air pollution control rules in Michigan to use best technology for reducing toxic emissions from new sources,
- virtually eliminating lead from gasoline,
- instituting a major program under the federal Clean Air Act to phase in reductions of 188 toxic pollutants from existing sources and
- implementing programs resulting in major reductions in the emissions of volatile organic compounds as part of reducing atmospheric levels of ozone.

Still, other challenges remain. For example, some additives to motor vehicle fuels designed to decrease emissions to the air have been monitored in the water column. In addition, the presence of mercury in fish tissue resulting in fish advisories is believed to be largely from atmospheric deposition. As reported in the 1996 Detroit River Remedial Action Plan, estimates of air deposition of some of the parameters of concern (e.g., cadmium, copper, lead and zinc) to the Detroit River suggest that loadings from the atmosphere are the same order of magnitude as the sum of loadings from known point sources. While emissions of certain pollutants may be low, some are persistent in the environment. These emissions will bioaccumulate and may grow to levels that are toxic to

the environment, humans or both. Moreover, the science of quantifying reductions in emissions of pollutants to the air needed to prevent unacceptable levels of deposition to water is still not well developed.

A serious concern is the limitation of information available on the concentration of toxic pollutants in the atmosphere. This information is necessary to help determine if levels in the air are protective of public health, and also to assess whether or not those concentrations are at levels of concern with respect to how they might impact water quality. This basic information is needed to help guide future allocations of resources.

Policies

In order to gain control and minimize impacts of pollution deposited from the atmosphere, SEMCOG will continue to support and advocate for regulations and programs designed to achieve continued, steady progress in reducing emissions of toxic pollutants to the atmosphere.

SEMCOG will also advocate for funding to create a comprehensive program to monitor concentrations of toxic compounds in the atmosphere. That program should be based on several factors, including evidence gathered in sediments, fish tissue sampling, information available in the Toxic Release Inventory, reports developed as part of the Great Waters Program in the federal Clean Air Act, experience in other states and policies incorporated in international and interstate agreements.

Water Quality Infrastructure

Overview

This section identifies various wastewater infrastructure issues related to protecting, improving and maintaining the designated uses of Southeast Michigan's surface waters that remain 20 years after the adoption of the original plan.

Providing adequate wastewater treatment and collection is essential to protecting public health and the environment. Therefore, wastewater infrastructure needs must be properly planned, located, sized, managed and maintained.

Even with the great strides made since the development of the original plan in industrial pretreatment, sewage collection and treatment infrastructure, there are needs that remain unaddressed. Many of these issues are the result of aging infrastructure, the need to respond to current growth patterns within the region, changes in regulatory performance requirements and the incremental approach to planning, construction and maintenance of wastewater facilities.

Sanitary sewer service is expanded for one of two reasons:

- to provide service in developed areas served by inadequate on-site or small systems or
- to provide service in areas under development or anticipated to be developed.

In both cases sanitary sewer infrastructure is related to land use and sustainability issues. The quality of ground and surface water is tied to land use practices.

Currently, the nearly five million people who live in Southeast Michigan rely on a variety of wastewater treatment systems. The largest provider of wastewater treatment in Southeast Michigan is the Detroit Water and Sewerage Department (DWSD). DWSD provides service for 78 communities and an estimated three million people through a wastewater transportation system that carries sewage to the treatment plant in southwest Detroit. The plant provides secondary treatment and discharges into the Detroit River. The DWSD system is combined in some areas carrying storm water (wet-weather flow) and sanitary sewage (dry-weather flow) which is either treated at the plant or, during certain rain events, partially discharged into either the Rouge River or the Detroit River. The residuals are incinerated and the ash is landfilled.

In addition to DWSD, there are approximately 60 other municipal wastewater treatment systems which provide the equivalent of secondary and, in some cases, tertiary treatment.

Some of these systems also treat combined sewage and experience CSOs during certain rain events. These municipal systems, including Detroit's, are subject to conditions in National Pollution Discharge Elimination System (NPDES) permits and, with few exceptions, generally have been operating in compliance with these permits.

In some places where municipal wastewater treatment service is not available, residences and businesses rely on small treatment plants or package plants for sewage treatment and disposal. These plants are often built to service a specific development and are not subject to expansion. Treatment methods include groundwater discharge and lagoon systems which eventually discharge into surface water. These plants are also subject to discharge permits and, when properly designed and maintained, can provide adequate sewage treatment for their users. However, if the management of these package plants is inadequate, water pollution threatens public health. When these systems fail, state law stipulates that the municipality may be required to assume responsibility for managing the system (section 3109 of Part 31 of Michigan Public Act 451 of 1994).

A third wastewater treatment option is the use of on-site or septic systems. On-site systems require suitable soil conditions and generally cannot support high-density development. If properly sited and maintained, they provide adequate service. When failure occurs, on-site systems pose health and environmental threats to surface waters as well as groundwater, which in many cases supplies the drinking water for the on-site user. As with package plants, when on-site systems fail, often the only solution to protect public health and the environment is to provide sewer service and connection to a municipal sewage system.

The provision of wastewater treatment infrastructure (i.e., sanitary sewage treatment and disposal facilities) for future development in Southeast Michigan is a major concern. The relationships between provision of sewer service, land use and sustaining designated uses are extremely complex. For example, sewering developed areas to replace failing on-site systems may encourage additional development which can stress water resources.

Many of the land use decisions to accommodate growth and development are the responsibility of local governments. Experience has shown that, regardless of intentions, land use decisions have resulted in severe degradation of our water resources. Local governments are now challenged to plan for accommodating future economic growth and development while maintaining the high quality of surface and groundwaters. They have the opportunity to plan for the provision of municipal services, package plants or on-site systems in a manner which protects the public health and the quality of the environment.

Dramatic land use changes are expected to occur in Southeast Michigan. Based on forecasts, an additional 24 percent (234,000 acres) more developed land may be needed to accommodate the anticipated growth in the region through 2020. Much of this growth

is anticipated in the headwaters area of the region's watersheds and poses threats to the area's natural and agricultural resources. Recognizing these challenges presents an opportunity for decision-makers to plan now and manage growth to accommodate the market demand while protecting natural resources and community character. Planning for wastewater management on a local, watershed and regional basis as part of comprehensive land use planning can provide needed service and contribute to preserving of water quality, air quality, open space, agricultural land and natural features.

Significant progress has been made since the development of the original Plan. Perhaps most notable is pollution prevention achieved by avoiding the use of toxic materials, pre-treatment programs and treatment of both municipal and industrial wastewater. However, problems posed by on-site disposal systems and reliance on package plants are emerging as serious regional concerns. A combination of constraints including financial capability, sewer capacity and plant capacity means extending sewer service to all these areas is unrealistic. Thus, planning for the wastewater "infrastructure" in the region must incorporate assurance of proper management of these on-site and package systems if water quality goals are to be achieved.

If remaining wastewater treatment and collection issues are not addressed through sustainability policies and efforts, achieving designated uses will be delayed.

Related Plan Goals

Of the Regional Goals of the Plan, the following have particular relevance to water infrastructure:

- To ensure the provision of structural and non-structural pollution control measures, including pollution prevention and considering impacts on fragile natural resources, while respecting public and private property rights.

- To ensure the preparation of water quality management strategies that are technically, environmentally, economically, politically and socially feasible.

- To ensure areawide water quality planning is integrated with other planning efforts, including emerging local, regional, state and federal policies and programs geared toward sustainable development.

- To provide for public participation in the planning process so that areawide water quality management programs reflect the concerns, priorities and values of the region's stakeholders.

- To assure a system of wastewater residual management that effectively eliminates negative effects on the quality of the environment.

- To increase the level of awareness of citizens, technicians and elected officials of the interdependence of Southeast Michigan's communities with respect to both water quality problems and the value of developing collaborative approaches for achieving, protecting and maintaining designated uses.

- To provide sufficient sanitary sewage treatment facilities necessary to ensure protection of public health and the environment, and to support achievement of designated uses and the sustainability of our environmental resources.

- To plan wastewater treatment facilities in coordination with the provision of other public services and facilities in a manner that promotes sustainable development.

Wastewater Treatment Capacity

Background

Currently there are more than 60 publically owned treatment works (POTWs) permitted in Southeast Michigan, ranging in size from 0.2 million gallons of wastewater per day of wastewater treatment capacity to the DWSD plant which has a design flow of 850 million gallons per day. These facilities are designed to provide at least the equivalent of secondary treatment for sanitary (dry weather) sewage flows prior to discharge; some are required to provide additional treatment to meet water quality standards. In addition to POTWs, wastewater treatment infrastructure includes numerous small private systems providing service to specific developments and thousands of on-site disposal systems used by homes and businesses.

Most of the POTWs in Southeast Michigan were built more than 25 years ago; many may require significant retrofitting, upgrades or improvements in order to continue to provide capacity efficiently and effectively. Similarly, failure to correct infiltration and inflow in some older sewer systems causes excess demands on capacity. Several POTWs are operating at or near design capacity and cannot properly treat additional wastewater discharges, while others have significant amounts of excess (unused) treatment capacity. Some systems, designed to treat both wet weather and dry weather flows, are overwhelmed during some storm events and intentionally discharge untreated sewage into surface waters to avoid backup into homes and businesses.

As population and employment in Southeast Michigan continues to grow and shift, additional capacity will be required to meet demands for wastewater treatment in the future.

More information is needed on sewer and plant capacity at existing facilities and how much of the anticipated growth in the region could be served by this existing infrastructure. Moreover, unsewered areas are frequently developed with on-site systems in the absence of adequate information regarding the capacity of the land to support such development.

Local governments are justifiably concerned about the increasing dependance on small, private wastewater treatment systems. Failure to properly operate and maintain these package plants occurs often and inevitably leads to system failure. When this happens, the state may require local units of government to take over the failing system.

Policies

Using existing wastewater treatment infrastructure is encouraged. To support this, an inventory of the capacity of existing and planned wastewater systems should be conducted. The inventory should include addressing capacity from existing infrastructure that could be recovered by cost-effective correction of infiltration and inflow problems. New treatment capacity should not be added until it is determined that existing capacity is insufficient or unavailable to meet needs. In areas where treatment capacity is reaching its limits, the adequacy of the sewage transport system and the ability of the POTW receiving the wastewater to provide adequate treatment need to be considered before new connections are allowed.

Local governments should determine the wastewater infrastructure needs for their community, considering at least the following:

- operation, maintenance and replacement needs for the existing infrastructure,
- expected additional capacity needs based on the master plan, zoning and growth and
- capacity of land to support on-site systems.

These should be used to establish development densities consistent with the ability to meet wastewater infrastructure needs.

CSOs initially should be mitigated using the appropriate mix of affordable technology and practices. Source control methods such as downspout disconnection and restrictive sewer grating should be considered. Where feasible, in-system capacity should be enhanced by structural and flow management techniques. Where necessary, sewer separation and/or construction of retention basins incorporating disinfection technology must be undertaken. Detroit Water and Sewerage Department's pilot source control programs, Wayne County's Rouge River National Wet Weather Demonstration Project findings and other similar pilot project findings should serve as guides for correcting CSOs in Southeast Michigan.

NPDES permits should require owners and/or operators of all systems to ensure that revenue streams are sufficient to cover the cost of the necessary repairs, operation and maintenance.

When new capacity must be provided to meet current and future needs it should be done in a manner that reflects local and regional sustainable development goals and policies. To do this, local governments should work together and with the state to consider how these needs can best be met, through either smaller, local facilities or larger, regional treatment plants. The subwatershed groups referred to in Tier Two of the Watershed Planning Section are the recommended forum for this local government networking.

The experience of treatment facilities with large retention basins to supplement or take the place of sewer separation should be considered. Where it is possible for a main interceptor of one treatment facility to be easily and inexpensively connected to another treatment facility for use in an emergency, the connection should be considered.

MDEQ should work with local governments in developing policies to address separate sanitary overflows (SSOs). Several factors should be considered in developing these policies including, but not limited to the following:

- recognition that SSOs are illegal,
- although illegal, SSOs will occur under certain conditions because design capacities will be periodically exceeded,
- the extent to which programs have been implemented to limit flow to the system such as infiltration/inflow mitigation and
- the need to balance public health impacts of discharges to surface water and sanitary sewage back up in basements.

Sanitary Sewer Service

Background

The facilities (201) plans developed by municipalities in the 1970s defined the areas for which sewer service was available and identified improvements necessary to meet their 20-year needs. Typically, municipalities constructed the sewers necessary to provide service to these areas. As state and federal grant programs for sewer construction were phased out, the provision of sewer service often became the responsibility of the land developer. This has resulted in an incremental approach to extending sewer lines, often on a subdivision-by-subdivision basis. This incremental approach to sewer extensions has resulted in lost opportunities for more cost-effective and environmentally sound practices that could be achieved from a more holistic approach.

DWSD is currently preparing a 50-year wastewater treatment plan to address anticipated demands in the growing part of the region. This provides an excellent opportunity for intergovernmental cooperation in planning for the amount and location of future sewer service. Coordination of planning for future sewer service is essential in minimizing conflicts between local plans and those of adjoining communities, as well as county and regional plans and policies.

Policies

DWSD and other multi-community wastewater treatment providers are encouraged to jointly plan with their current and future wholesale customers for the amount and location of new sewer service. These efforts would result in facilitating sustainable development practices and ensuring that wastewater needs are adequately and appropriately met, that economies of scale are achieved where possible and that costly duplication of effort is avoided.

Local sewer planning should consider the plans and growth patterns of adjoining municipalities, as well as county and regional plans and policies. This will mitigate adverse impacts resulting from the actions of one municipality on neighboring communities, while taking advantage of any economies of scale.

Development plans need to be compatible with planned sewer service. To support this, sewer service planning should be an element of the community master planning process. In their master plans, communities should identify their short-range sanitary sewer infrastructure needs — five to 20 years — as well as the location and capacity of sewering needed to support full development of the plan. Master plans should address the impacts of infiltration and inflow, storm water and CSOs as well as dry weather flow. The master plan should also include the identification of areas that are unsuitable for on-site systems and those that should not be sewered (e.g., environmentally sensitive lands, floodplains, etc.).

Developed areas dependent upon on-site systems which are either currently experiencing septic system failures or expecting such failures should be a priority for corrective action. Sewering should be accomplished in a manner that does not encourage development inconsistent with local, watershed or regional plans or policies. SEMCOG's regional development forecast must be considered the demographic basis for determining future sewer needs in communities in Southeast Michigan.

Allocation of Limited State and Federal Funding

Background

Sewerage infrastructure is only one of many fiscal and management responsibilities of local governments. State and federal grant and loan programs played an essential part in funding the municipal wastewater treatment and collection systems currently in place in Southeast Michigan. However, funding for these programs has greatly diminished in recent years, requiring municipalities to find other means of paying for upgrading and expanding their wastewater control systems.

The cost of maintaining and replacing aging sewerage infrastructure often exceeds the available funding. Often, rate structures have not provided for necessary upgrading and maintenance. In addition, the true cost of growth to local governments is often hidden because infrastructure costs are frequently spread over the existing rate base, rather than directly funded by the new development. Finally, the ability of communities to fund upgrades of aging infrastructure, finance new infrastructure to support growth and pay for ongoing community services is unlikely without continued state and federal assistance.

Policies

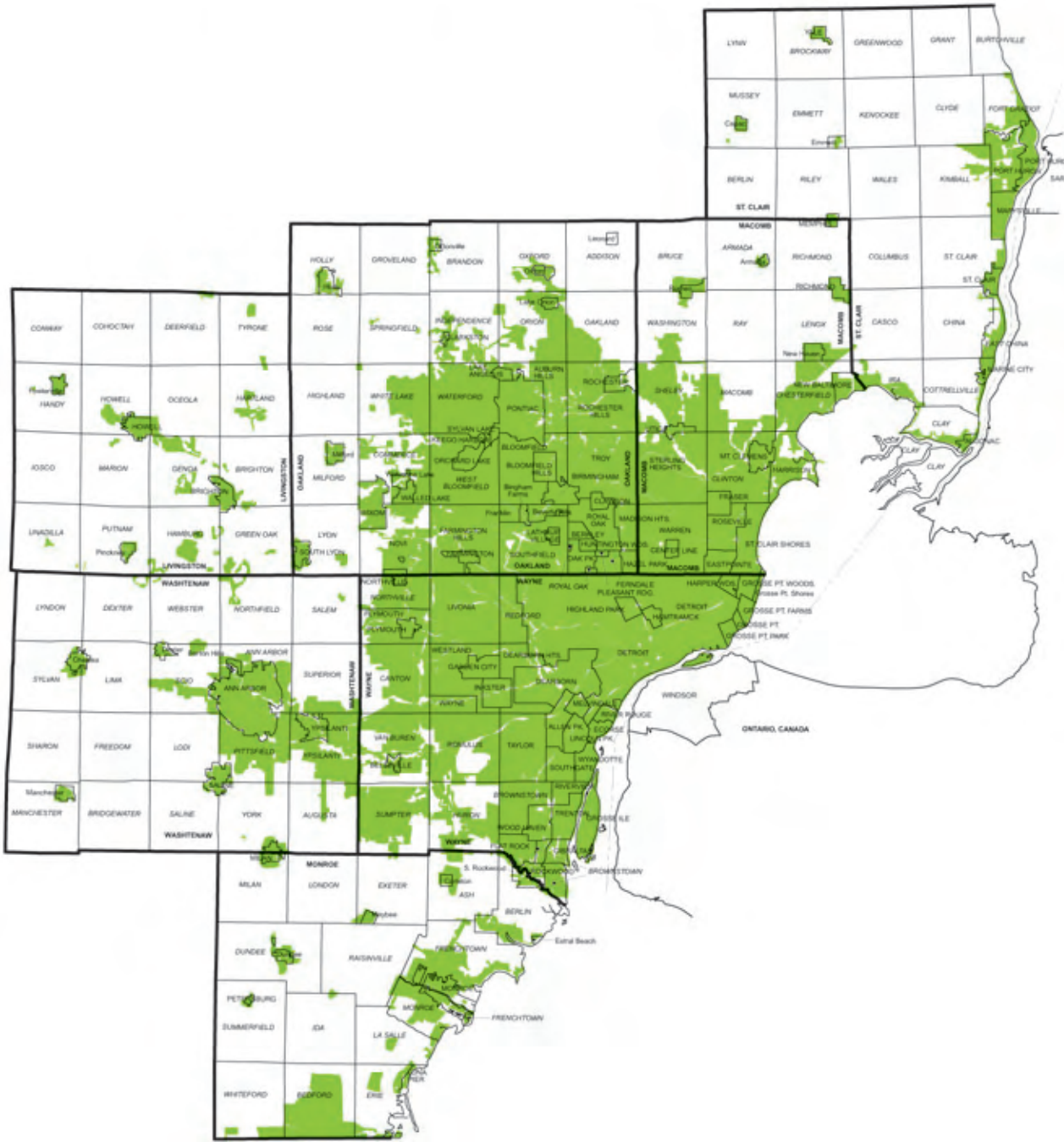
Growth and development pressures will require the construction of additional capacity to meet new needs. The cost of providing additional capacity should be paid for by those receiving the new service. The "growth policy" of the Detroit Water and Sewerage Department, adopted in 1996 and amended in 1998, which states that all system infrastructure growth be self supporting, is a model for sustainable funding.

To the extent possible, outside funding should be sought to meet current and future needs within the existing infrastructure service areas. Before expanding service to other areas, all of the following factors should be identified:

- cost-effectiveness, considering impacts on public health, designated uses and the environment;
- cost of capital improvements;
- cost of maintenance and
- secondary impacts.

Limited federal and state funding for sewer service should be targeted toward resolving documented existing health problems. When state or federal funds are requested for a sewer project and the area to be served with sewers is within the "areas eligible for sewer service funding" (see Figure 8) the project is considered consistent with the Plan and a favorable recommendation for funding is made. If the area is outside of the "areas eligible for sewer service funding," an unfavorable recommendation is given unless the RC2 amends the eligibility boundaries. In order to amend the funding eligibility boundaries there

Figure 8
Areas Eligible for Sewer SErvice Funding in Southeast Michigan



must be sufficient documentation that sewers are needed to address a public health concern.

Wastewater Management Coordination

Background

In recent years, the collection and treatment of municipal wastewater has become significantly more complex, both technically and politically. New and emerging regulations require that municipalities expand their role in areas such as control of CSOs and storm water. Additionally, the role that the provision of sewer service plays in a community's growth and development, as well as the secondary impacts of infrastructure development are just now being recognized.

New approaches to managing municipal wastewater and meeting regulatory requirements are being developed and implemented across the country, state and within the Southeast Michigan region. Sharing information between providers can lead to the more efficient and effective provision of wastewater treatment and collection services. The opportunity to jointly examine and comment on new and proposed regulations and laws can provide wastewater treatment and collection providers with a more effective voice with regulatory agencies and the legislature. In addition, this networking could serve as a forum for discussing ways of collaborating on cost-effective means of compliance.

Policies

A Southeast Michigan Wastewater Treatment and Collection Providers' Forum should be established for the purpose of addressing common and emerging issues and the facilitating of information and technology sharing. Among the issues this forum might consider are:

- an inventory of regional wastewater treatment capacity,
- the efficient use of existing capacity,
- the adequacy of current programs to properly manage wastewater residuals,
- the amount and location of new wastewater treatment facilities and
- providing wastewater facility services that are consistent with watershed management.

If requested, and as resources permit, SEMCOG could take on the coordinating function among wastewater treatment and collection providers in the region, provided that such activities are consistent with its by-laws.

Habitat

Overview

This section of the Plan describes the interrelationship between protecting, restoring and maintaining designated uses and habitat management.

Protecting and enhancing habitat is a key component of water resource management. The natural areas of Southeast Michigan — often cited as habitat areas — directly effect the quality and quantity of our water resources and impact bio-diversity of our region. For purposes of this Plan, habitat areas are defined as natural environment land uses such as open water, wetlands, open spaces and upland woodlands. Natural habitat areas provide a number of benefits, many of which are directly linked to designated uses:

- breeding, feeding and cover from predators for fish and wildlife,
- filtering pollutants from storm water during rain events,
- providing reservoir capacity during flood events,
- providing opportunities to recharge groundwater supplies,
- sustaining community character and increasing property values and
- providing recreational opportunities such as hiking, hunting, fishing, boating and photography, etc.

Overall, the long-term sustainability of the water resource for specific designated uses is dependent on plant and animal life, which can only be attained with adequate quality and quantity of habitat.

Related Plan Goals

Of the Regional Goals of the Plan, goals the following have particular relevance to habitat management:

- To protect, enhance and restore the chemical, physical and biological integrity of the waters of Southeast Michigan in order to achieve designated uses.

- To prevent new and reduce existing negative water quality and quantity problems from nonpoint sources to achieve and maintain designated uses.

- To ensure that the regulation, location, modification, construction and operation of any facilities, activities or substantive changes in use of the lands, which might result in any new or deleterious discharge directly or indirectly into the region's waters, are undertaken in a manner that promotes sustainable land use development patterns.

Protection of Habitat

Background

Protecting and restoring habitat areas in Southeast Michigan is critical to the region's water resources. Habitat is imperative in the sustainability of the region's ecosystem. In order to have a balance within the plant and animal kingdom, there needs to be adequate habitat to support their needs. This biodiversity increases the region's economic and aesthetic well being. Nationwide studies have shown a significant increase in lot prices if it abutts a habitat area, such as a wetland or open space, instead of other lots.

Habitat areas also provide various other functions including quality of life, flood control and water quality. However, these important functions are threatened by land use practices that lead to elimination of natural areas, fragmentation and degradation of the resource. The potential loss of habitat could be exacerbated by major land use and demographic changes occurring in developing areas of Southeast Michigan. According to SEMCOG forecasts, 234,000 additional acres will become urbanized by 2020. If not managed correctly, this increased urbanization will have major effects on the habitat of Southeast Michigan and will be an impediment to reaching water quality goals.

Communities, business, state and federal agencies and various other stakeholders all have an opportunity to take an active part in enhancing and protecting the habitat of Southeast Michigan. Proper habitat management can take many forms, from performing a natural features inventory and integrating it into the local planning process to natural landscaping to implementing habitat monitoring programs. Regardless of which management method is utilized, it is imperative to the region's sustainability that habitat management be integrated into stakeholders' decision-making processes.

Policies

All stakeholders within the region should strive for a balance protecting between habitat and changing land use patterns, leading to a more sustainable region.

Communities should have a natural features inventory performed for their community and use this information to update master plans, zoning and other ordinances.

As part of the subwatershed planning process, communities should work with other communities to develop plans that connect valuable habitat areas. For example, developing a greenways plan and system to connect valuable habitat areas is one way communities can work cooperatively with other communities and organizations to preserve these valuable habitat corridors.

Communities should encourage preservation and restoration of natural areas in their community through:

- open space ordinances,
- cluster development,
- purchase of development rights,
- transfer of development rights,
- land purchase,
- overlay zoning techniques and
- other ordinances as deemed necessary.

Communities, state and federal agencies should support the work of land conservancies. Communities and subwatershed planning groups should integrate these preserved parcels into their local and subwatershed planning processes.

Businesses should incorporate natural landscaping into their landscape practices. Communities should incorporate natural landscaping into their property and should require it as part of their site plan review process.

Businesses and communities should work together to maintain the natural drainage system when proposing and reviewing a site plan.

State and federal agencies should be encouraged to continue programs that monitor and prevent the spread of exotic species in the region. Businesses, citizens and communities should be educated about exotics and how to prevent future propagation in the region.

Regional, state and federal agencies should support and implement fisheries and habitat management programs consistent with the Plan.

The state should implement a monitoring program designed to adequately assess the quality of the region's resources, including developing and implementing a monitoring program to support issuance of fish consumption advisories.

State and federal agencies should provide technical assistance to local governments on natural resource conservation issues.

Protection of Wetlands

Background

The importance of wetlands to water quality management lies in the natural functions or services they provide as a part of a watershed's ecosystem, both in terms of water quality and quantity. They often serve as hydrologic buffers and reservoirs during storm events

and dry periods by providing for storage, infiltration and evaporation. In addition, they can trap, retard or transform materials such as sediment, nutrients, and organic matter.

Benefits wetlands provide include:

- absorbing and breaking down pollutants,
- cycling nutrients,
- binding soils,
- degrading organic wastes and
- purifying water.

Wetlands also serve as habitat for numerous species of plants and animals whose welfare depends on the health of the wetland. In addition, wetlands have recreational, historical, scientific and cultural values.

The most serious threat to wetland viability is land development that ignores the function and value of wetlands. Of special concern are the headwaters areas of Southeast Michigan's watersheds, where major land use changes will occur in the next two decades.

The impacts of development of wetlands on water quality and habitat are a function of development-incurred alterations of wetland hydrology. Types of alterations include raising or lowering water tables and/or changing circulation patterns. These hydrological impacts result from such activities as filling, dredging, draining and construction.

The immediate water quality impacts of loss of wetlands include loss of pollution removal capability, loss of water storage capacity and release of stored nutrients. Although wetlands have a cleansing function in their natural state, directing untreated storm water from developed areas into wetlands can cause severe damage. However, constructed wetlands that are designed to store and remove some pollution from runoff can be effective.

The most severe impacts result from the common practice of draining wetlands. As wetlands dry up, they become clogged with sediments and pollutants or disappear completely. As a result, the plant and animal wildlife that rely on them disappear as well.

Michigan Public Act 451, Part 303 of 1994 — the Wetlands Protection section of the Natural Resources and Environmental Protection Act (NREPA) — provides a regulatory system governing all of Southeast Michigan's wetlands contiguous to the Great Lakes, an inland lake, pond, river or stream, as well as all noncontiguous wetlands greater than five acres in size. The act provides, among other things, for the establishment of an MDEQ permitting system to regulate the dredging, filling, draining of wetlands, and the construction, operating, or maintaining of any use or development, in a wetland except those specifically exempted in the act. In cases where permitted activities result in wetland

loss, MDEQ encourages mitigation in the form of restoration of a former wetland or creation of a new wetland preferably in the same watershed. The Shoreland Protection and Management (P.A. 451, Part 303, 1994) and the Inland Lakes and Streams (P.A. 451, Part 323, 1994) sections of the NREPA provide protection for additional, specific wetlands.

In addition, Part 303 provides for the enactment and administration of wetlands ordinances at the local level under agreement with MDNR.

Policies

State and local policies and, where appropriate, private sector initiatives need to be adopted to protect, restore, enhance and increase wetlands in Southeast Michigan. A "no net loss of wetlands" policy should be the minimum goal of this effort.

Fundamental to wetland protection is an accurate inventory of wetland resources. The state should complete its inventory of wetlands, giving priority to those in imminent danger of degradation.

Using proven, cost-effective techniques, local governments should conduct field inventories to produce accurate maps of wetlands within their jurisdiction and should consider adoption of local wetland ordinances consistent with state law. These maps and ordinances should be integrated into the community's comprehensive planning process.

Wetland mitigation projects and wetland banks established for future mitigation should provide, in the affected watershed, replacement of significant functions having the same or greater value than those lost in permitted wetland alteration activities.

SEMCOG will advocate for preservation of wetlands through open space planning and the acquisition of high-priority wetlands by both the public and private sector.

Protecting the Stream Corridor

Background

The riparian land adjacent to a stream plays an especially critical role in protecting of water quality, avoiding flood damages, maintaining wildlife habitat and access to water-related recreation. The land along a stream forms a linear riparian corridor. Much of these lands are floodplains and subject to periodic flooding. Often, much of the corridor is wetlands. Prior to development, these lands have lush plant growth and harbor a great diversity of plant and animal species. Continuous interactions occur between aquatic, riparian and upland ecosystems. Riparian habitat, while harboring the richest diversity of flora, fish and wildlife, is one of the most abused ecosystems. Where once the United States had 121 million acres of land within the 100-year floodplains, today only 23 million acres remain.

The driving force for stream degradation is the increase in runoff resulting from development throughout the watershed. A riparian corridor in natural condition acts as a filter to protect water quality. The vegetation and forest litter reduces runoff, prevents erosion and physically traps sediment and associated pollutants. The canopy of trees and bushes over the stream provides shade keeping the water cool and providing habitat and food for aquatic species. The vegetation maintains a stable streambank, reducing sedimentation which can destroy aquatic habitat and impact the fishery.

A riparian corridor not only provides habitat for wildlife but allows movement from place to place. The ability to move when breeding maintains a robust gene pool; many animals need different conditions during various parts of their life-cycle. In suburban areas, animals may need escape routes from intrusion by people or their pets.

Recreation opportunities are enhanced in an undeveloped stream corridor. Canoeists, hikers and fishermen can enjoy the aesthetics and wildlife observation opportunities. Many riverfront trailways are being developed in Southeast Michigan and promoted with the Southeast Michigan Greenways Initiative Plan.

A floodplain is that area of land adjacent to a water course, temporarily covered by water overflowing the streambanks. To minimize the threat to life and destruction of property, federal and state governments require elevation of buildings above the 100-year flood stage (the riparian area having a one percent chance per year of being inundated by a flood) or flood proof construction. This encourages a “fill and build” approach of river channelization and loss of the environmental and water quality benefits of natural floodplains. Floodplain delineations (maps) do not reflect impacts of new development in the watershed. Local floodplain regulations are encouraged by making flood insurance available to property owners in regulated communities. In spite of the regulatory programs, flood losses continue to increase.

Buffers to reduce streambank erosion have been documented to increase the value of adjacent properties, reduce the number of drainage complaints to local governments and be maintained more cost-effectively when managed with natural plant species rather than turf.

Policies

Local governments should incorporate measures into their master plans and ordinances to protect the 100-year floodplain areas. No building encroachments should be allowed which will significantly impact flood storage capacity, water quality protection functions or wildlife habitat.

Local floodplains regulatory ordinances should go beyond the minimum standards of federal and state floodplains protection laws to preserve the environmental values of floodplains.

Ordinances should require a 100-foot development, or riparian buffer, where there are low-to-moderate slopes. Where there are wetlands or steep valley sides which extend beyond 100-feet, a boundary should be extended to include these sensitive areas.

Communities should conduct a corridor inventory to identify preventive and remedial opportunities that may mitigate impacts of existing or future development. Protection measures should include a full range of conservation techniques beyond setbacks and floodplains regulations including:

- cluster development,
- transfer of development rights,
- land acquisition,
- outright purchase or
- conservation easements.

Public trailways, where appropriate and feasible, should be incorporated into riparian corridors as an effective way to ensure widespread public support for the plans.

Through preservation and restoration, communities should actively strive to achieve and maintain the natural land use in riparian zones (i.e., it is recommended 60 percent remain in the historic land use). Native plant species are preferred to maximize stream cooling, habitat and streambank stability.

Communities should cooperate to maintain, where feasible, continuous riparian corridors. Where feasible, stream crossings by roads or utility lines should be limited to less than two per kilometer of stream length. Effective erosion control at stream crossings should be employed.

New discharges from storm drains into streams or natural wetlands should be managed so that some combination of buffering, pre-treatment and best management practices eliminates or minimizes the velocity and quantity of discharges and pollutant loadings. Communities should also reduce, through retrofitting, impacts from existing discharges to the extent practicable.

Because the definition of floodplain areas varies over time as a result of anthropogenic activities, MDEQ or FEMA should periodically update the floodplain maps for Southeast Michigan to ensure that local governments have accurate information regarding the extent of floodplains. These agencies should seek to partner with local governments in preparing these maps.

Public Education and Participation

Overview

This section of the Plan describes the role of public education and participation in protecting, restoring and maintaining water resources of Southeast Michigan.

Public education and participation are essential elements in protecting and restoring the region's water resources. Strong public education and participation programs provide communities with an opportunity to build support within jurisdiction for their water-related projects and the actions necessary to implement these projects. Public education and participation will result in preserving and improving the water resource because more stakeholders will act to reduce their impact on the resource and to build support within their peer group(s) for community action.

Related Plan Goals

Of the Regional Goals of the Plan, the following have particular relevance to public education and participation:

- To protect, enhance and restore the chemical, physical and biological integrity of the waters of Southeast Michigan in order to achieve designated uses.

- To prevent new and reduce existing negative water quality and quantity problems from nonpoint sources to achieve and maintain designated uses.

- To provide for public participation in the planning process so that areawide water quality management programs reflect the concerns, priorities and values of the region's stakeholders.

- To increase the level of awareness of citizens, technicians and elected officials of the interdependence of Southeast Michigan's communities with respect to both water quality problems and the value of developing collaborative approaches for achieving, protecting and maintaining designated uses.

- To provide educational programs for Southeast Michigan stakeholders, including those programs that advocate voluntary pollution prevention actions and stewardship of water resources by the general public, government and business.

Background

There are two components to increased public education and stewardship of the region's water resources — awareness and action.

Building awareness about the water resource is an essential first step in what is often a long-term process. Stakeholders throughout Southeast Michigan have differing attitudes and perceptions regarding their water resources. Addressing awareness ranges from changing perceptions about the resources' worth, educating that these resources are part of a larger system, and providing information on how current practices may alter their resource into something undesirable for the community.

For example, in some areas of the region, water resources are seen as nothing more than an open sewer with no chance of ever being clean again. In this case, the focus would be on educating that restoration is possible, thus turning a "problem" into a valuable asset for the community.

In other parts of the region, the resource may be a designated trout stream that is already valued as a community asset. In this case, awareness building would focus on educating that streams can quickly become degraded if proper preservation efforts are not in place.

After raising the awareness of the stakeholders' group, it is essential to provide an opportunity for stakeholders to take action in preserving or restoring the resource. Stewardship activities should be offered at both the individual and community level to allow ample opportunities for stakeholder involvement. These activities are often implemented by school groups, the local community, watershed council or a community organization.

Another key participant in this process is the business community. Leaders in the business sector can help implement public education and stewardship programs. The business community's role in environmental protection is no longer simply compliance, as many are active participants in various aspects of environmental protection and should be encouraged to focus on issues related to this Plan.

In addition to public education and stewardship, public participation in community planning — including the development of watershed and subwatershed management plans — is essential in building support for local and regional planning. By actively seeking public input, communities can shape their policies and programs in ways that will meet community needs and allay concerns. Seeking public input also alerts decision makers to potential problems early in the process, which can save time and money and significantly improve and validate planned projects. The result will be greater popular support for these projects because, through public participation, various stakeholders will take ownership in the projects and identify the resource as a valued community asset.

Policies

The following policies are geared toward raising public awareness as a first component in building a strong public education program.

- Communities should develop programs and products that promote the identity and value of water resources in their community.

- Communities should develop specific activities to increase awareness of the water resource. Examples include signage listing the name of the water resource, signage indicating when entering a watershed, newsletters and collecting information and data related to the quality of the water resource.

- SEMCOG should support local efforts by providing informational materials and acting as a clearinghouse for public education materials in Southeast Michigan.
- Owners and operators of POTWs should be active participants in developing and distributing educational materials within their service area.

The following policies are focused on providing stewardship opportunities in order for stakeholders to take action in protecting and restoring their water resources.

- Consistent with their increasing participation in environmental protection, businesses should be active participants in increasing environmental awareness and providing stewardship opportunities for their employees, customers and the community.

- Student education programs should be developed in all watersheds in Southeast Michigan.

- Environmental programs should be developed in all watersheds in Southeast Michigan, such as river cleanups, storm drain stenciling and adopt-a-stream.

- The ongoing efforts of local watershed councils, such as the annual regional River Day, should be supported.

- Communities should develop programs for the business community, such as Washtenaw County's Business Partners for Clean Streams Program and the state Retired Engineer Technical Assistance Program (RETAP).

- A speaker's bureau should be developed and utilized providing stakeholders with information on the identity and value of their water resources and specific

actions and stewardship programs in which they can participate. Potential organizations to include are:

- watershed councils,
- county planning departments,
- county drain offices,
- SEMCOG,
- East Michigan Environmental Action Council,
- colleges and universities,
- MDEQ,
- United States Geological Survey and
- Remedial Action Plan committee members.

C Communities should create information centers that contain informational materials, kiosks and/or maps that show the location and value of their water resource and provide stewardship opportunities for the various stakeholder groups.

C Communities, the media and environmental organizations should reward good behavior that protects our region's water resources. Some examples are newspaper articles on the progress of protecting water resources and awards programs that recognize these positive behaviors .

The following policies focus on the need for public participation in community planning in order to build support for and implementation of local and regional planning projects.

C Stakeholders should be active participants in developing subwatershed and watershed plans. This process should include clear goals, objectives and milestones for the public participation process. Stakeholders should also be included on various committees formulated in development and implementation of watershed plans.

C Visible, user-friendly, two-way communication mechanisms should be developed between stakeholders and watershed plan developers. Some possible mechanisms include Web pages, cable television and local newspapers.

Pollution Prevention

Overview

Early approaches to environmental protection focused on controlling pollution at the point of discharge to the environment. The most common example is pipes discharging from sewage treatment plants. Pollution prevention is a paradigm shift and focuses more on reducing or eliminating the generation of waste at the source, instead of at the point of discharge.

In 1990, Congress passed the Pollution Prevention Act which declared that "source reduction is fundamentally different and more desirable than waste management and pollution control." This act attempts to shift the emphasis away from managing wastes toward the more sustainable objective of reducing the amount of waste generated. As a result, USEPA has embraced pollution prevention as the appropriate alternative to "end-of-pipe" pollution controls, favoring prevention and reduction over recycling and reuse, with the least preferential options being disposal or release into the environment.

The Michigan legislature enacted the Waste Reduction and Waste Minimization Assistance Acts in 1993, establishing the state's commitment to this philosophy. The MDEQ has subsequently established programs to educate and assist businesses in exploring and implementing pollution prevention. To this end, staff of both USEPA and MDEQ have been designated to further pursue this approach.

Pollution prevention is not a single activity, but rather a systematic way of exploring all activities and processes in order to identify opportunities for cost-effective methods of eliminating or reducing pollutant releases to the environment. In addition to reducing the amount of pollutants entering the environment, pollution prevention often results in savings by reducing the cost of raw materials and the treatment and disposal of wastes.

Related Plan Goals

Of the Regional Goals of the Plan, the following have particular relevance to water infrastructure:

- To ensure the provision of structural and non-structural pollution control measures, including pollution prevention and considering impacts on fragile natural resources, while respecting public and private property rights.

- To ensure the development and implementation of laws, programs and practices that prevent the discharge or deposition of toxic pollutants in toxic amounts into the region's waterbodies.

Background

There are two different levels of pollution prevention that Southeast Michigan stakeholders can undertake to protect water quality. The first relates to their own activities resulting from day-to-day operations. For local governments, this may include such things as the operation of their public works and vehicle maintenance facilities and parks and recreation activities.

Second, they can promote pollution prevention through education programs and the adoption of policies and/or ordinances targeted at specific activities. Businesses can work with their suppliers and contractors to ensure that appropriate pollution prevention measures are identified and implemented. Local governments can develop and implement public education programs aimed at informing their citizens and businesses of various pollution prevention measures they can adopt along with the associated benefits.

A number of resources are available to assist in developing and implementing a pollution prevention strategy. MDEQ's Environmental Assistance Division has a wide range of programs aimed at promoting pollution prevention. Also, RETAP provides pollution prevention assistance to Michigan businesses and institutions.

Policies

SEMCOG should serve as a clearinghouse for pollution prevention information related to local governmental activities.

The Providers Forum (see Water Quality Infrastructure section) should be used as a means of disseminating pollution prevention information to POTW operators.

Businesses and municipalities should implement pollution prevention and waste reduction philosophies into their operations and practices. They should evaluate their operations and look for pollution prevention opportunities by performing environmental audits, self-assessments or other pollution prevention activities to reduce or eliminate waste and, in turn, reduce operational expenses.

As part of their own pollution prevention strategies, businesses and municipalities should work with their suppliers and contractors to ensure that appropriate pollution prevention programs are developed and implemented as a means for reducing wastes throughout the production cycle.

Local governments should develop public education and outreach programs to inform citizens and businesses of how their individual actions impact water quality and provide information on how they can modify their activities to eliminate or reduce their impact on water quality.

Local governments should review their ordinances, particularly their sewer use ordinance, and identify appropriate opportunities to require the adoption of pollution prevention measures. This may include such things as requiring industrial dischargers to municipal sewers to certify that there are no illicit discharges to the storm sewer system or that riparian buffer strips are established and maintained in developments.

Businesses should develop public education and outreach programs to inform their customers and clients of their pollution prevention strategy and the benefits of waste reduction over waste management.

SEMCOG should support the education of business, government and citizens on the benefits of pollution prevention and the process for implementing those measures.

Index

Appendix A
Designated Uses

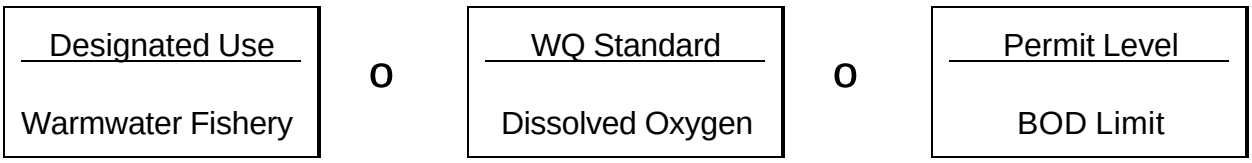
The Clean Water Act requires that states adopt water quality standards that set numerical limits that are protective of both public health and the environment. Michigan's water quality standards (Part 4. Water Quality Standards, Promulgated pursuant to Part 31 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended) specify the minimum physical and/or chemical parameters which surface waters must meet and are directly related to designated uses. Achieving these water quality standards is a benchmark in establishing discharge limits and/or conditions for particular pollutants within national pollutant discharge elimination system (NPDES) permits.

Michigan water quality standards are intended to protect the following designated uses:

- Agriculture — water is suitable for crop irrigation and livestock watering;
- Navigation — waterways are unobstructed by floating materials and do not contain chemicals that interfere with boat functions;
- Industrial water supply — water quality is adequate for use in industrial processes;
- Public water supply at the point of water intake — water is suitable for human consumption where public intakes are located;
- Warmwater fishery — fish can thrive and reproduce;
- Other indigenous aquatic life and wildlife — animals, other than fish, that rely on surface waters can thrive and reproduce and
- Partial body contact recreation — water causes no unacceptable conditions in people involved in activities such as fishing, boating or wading.

Additionally, all surface waters are designated for total body contact recreation (causes no unacceptable conditions in people involved in activities where they are immersed in water, such as swimming) from May 1 to October 31 and certain waterbodies are designated for, and protected as, coldwater fisheries (coldwater fish species can thrive and reproduce).

The following schematic illustrates the relationship between designated uses, water quality standards and permit levels. In this example, a waterbody is protected for a warmwater fishery. The water quality standard for dissolved oxygen (DO) is established at minimum level that will support fish. Permits for sources discharging to the waterbody have a maximum level on the amount of biochemical oxygen demand (BOD) material (organic matter) that they can discharge to the waterbody and not cause the DO level to fall below the minimum level needed to support the warmwater fishery.


Designated Use
Warmwater Fishery
O
WQ Standard
Dissolved Oxygen
O
Permit Level
BOD Limit

Appendix B
Watershed Management

Introduction

Watershed management provides a comprehensive approach to addressing water quality issues. Watershed management provides an opportunity for addressing the many factors that impact the quality of our water resources. Because water quality reflects the history of the land through which it has flowed, watershed management involves much more than simply focusing on the in-stream quality of water.

Watershed management is an iterative process of integrated decision-making regarding uses and modifications of lands and waters within a watershed. This process provides a chance for stakeholders to balance diverse goals and uses for environmental resources, and to consider how their cumulative actions may affect long-term sustainability of these resources. The challenge is to assure that the complexities of watershed management do not become so overwhelming that they impede any movement toward increased intergovernmental cooperation in addressing water quality issues. For this reason, and because the major watersheds in Southeast Michigan are relatively large and diverse, implementation of water quality improvement activities should be initiated at the subwatershed level. This allows communities that share common interests and challenges to work together in small groups.

Components of Watershed Management

Following is a list of some major components that should be considered in a watershed management process. These and other issues need to be incorporated into watershed management, preferably in the three-tiered process described in the Plan (see page 59).

Environmental education
Local officials and the public need to understand the complex relationships between their decisions and activities, particularly those related to land use issues and water quality. Understanding how public and private choices impact water quality is essential to protecting and improving the quality of life in Southeast Michigan.

Storm water
The management of storm water for water quality protection has only recently become a concern for many local governments. Regulatory programs are being expanded to include many communities in Southeast Michigan.

Michigan's voluntary Storm Water General Permit provides an excellent opportunity for initiating watershed management planning. SEMCOG strongly recommends that communities in the region apply for coverage under the voluntary state permit. In fact, by complying with the Storm Water General Permit, many watershed management components are addressed, such as: illicit connections, public education, subwatershed planning and pollution prevention. Coverage under this permit will also satisfy their obligation under the federal Storm Water Phase II Regulations.

Headwaters protection
Headwaters protection recognizes that water quality must be protected in the high-growth areas of the region before development occurs. Headwaters protection should be a key component of subwatershed planning and explicitly address processes to assure that growth occurs in a manner compatible with maintaining or achieving designated uses.

Total Maximum Daily Loads (TMDLs)
Many of the surface waterbodies in the State of Michigan for which TMDLs will be developed are in Southeast Michigan (see Table C-2). Identification of loading targets is an excellent issue to address in watershed planning. This could take the form of a TMDL or some locally developed target emerging from a watershed planning process.

Remedial Action Plans (RAPs)
Southeast Michigan has five Areas of Concern (Rouge, Clinton, Detroit, St. Clair and Raisin Rivers) for which Remedial Action Plans have been developed. The RAPs provide another framework for which communities can come together to do subwatershed planning. However, designation as an Area of Concern requiring RAPs should not be viewed as a prerequisite to undertaking watershed planning.

Water quality trading
The Michigan Department of Environmental Quality is in the process of establishing a Water Quality Trading Program. Trading provides another opportunity for cost-effective pollutant reductions. Subwatershed planning provides an excellent framework for identifying trading opportunities that result in cost-effective maintenance or achievement of designated uses.

Growth management/sustainable development
Urban redevelopment, high growth in headwaters areas, suburban in-fill and conversion of rural/agricultural lands will significantly alter the landscape of Southeast Michigan over the next 20 years. Watershed management provides an opportunity to incorporate sustainable

practices into the fundamental programs local governments use to guide decisions (i.e., zoning, master planning, and site plan review) to ensure water quality protection.

Habitat protection and restoration

As land is converted from a natural state to agriculture or developed for urban/suburban use, habitat is lost. This trend is likely to continue with pressures for additional growth. However, by recognizing the need for smart growth and incorporating habitat protection and restoration principles into local decision-making, high quality and/or important habitats can be preserved.

Using Transportation Planning as a Model for Intergovernmental Cooperation in Watershed Planning

Transportation planning process overview

While the Plan strongly advocates the pursuit of watershed management, it does not prescribe a single approach. Rather, the focus of the plan is on the benefits of watershed management and identifies components of the planning process. While not prescribed in this Plan, the transportation planning process established under federal transportation law provides a model which communities could consider for watershed planning. This program for integrating national program requirements with state standards and local priorities evolved under the federal Intermodal Surface Transportation Efficiency Act (ISTEA) and the most recently adopted federal Transportation Equity Act for the 21st Century (TEA-21).

As implemented in Southeast Michigan, ISTEA has been successful in creating a process that encourages cooperative decision-making by local governments who share power and authority.

The intergovernmental cooperation needed to develop a regional transportation plan is similar to that required to plan and implement a watershed-based water quality protection and enhancement strategy. Local opportunities and constraints need to be blended with state and federal requirements to establish the steps designed to meet common long-range goals.

Under ISTEA, access to federal transportation project funding is a major incentive that encourages local and state agencies to develop consensus action plans within specified geographic transportation planning areas. However, delegating decision-making to local governmental units for initial planning and sharing power between the state and local units in approving funding for specific projects has evolved into a significant incentive for encouraging intergovernmental cooperation. While a similar federal program with funding that encourages the same kind of intergovernmental cooperation to plan and implement

watershed-based water quality improvements does not exist, there are still many benefits for communities to work together in a process similar to that used in transportation.

The key related requirements in TEA-21 are described below.

- Requires transportation projects to be fiscally constrained.
- Requires projects to be consistent with the adopted long-range transportation plan.
- Requires comprehensive intermodal programs addressing roads, bridges, rail, etc.
- Requires periodic update of the transportation plan.
- Requires consistency of the plan/programs with the air quality plan.

Watershed Management Planning Utilizing the Transportation Model

The following section describes the roles that local, state and federal governments could undertake using components of TEA-21.

Comparison between TEA-21 Requirements and Watershed Management Process

TEA-21 Requirement	Watershed Management and Local Governments	Watershed Management and State and Federal Government
Requires transportation projects to be fiscally constrained. As implemented in Southeast Michigan, projects within each county are fiscally contrained.	Subwatershed plans should identify fiscally constrained projects to implement the plan.	Watershed, state and federal plans should include fiscally constrained projects to implement the plan.
Requires projects to be consistent with the adopted long-range transportation plan.	Projects implemented by local governments (e.g., road crossings, storm water controls, flood mitigation) should be consistent with subwatershed plans. Subwatershed should also work together to form the long-range, watershed-wide plan. Subwatershed plans should be consistent with this Water Quality Management Plan and the watershed-wide plan.	Projects implemented or funded by state or federal agencies should be consistent with watershed, state or federal goals and plans and should emanate from local subwatershed plans.

Comparison between TEA-21 Requirements and Watershed Management Process		
TEA-21 Requirement	**Watershed Management and Local Governments**	**Watershed Management and State and Federal Government**
Requires comprehensive intermodal programs addressing roads, bridges, rail, etc.	Subwatershed plans should be comprehensive and include such topics as in-stream factors, nonpoint sources, land use implications and habitat.	Subwatershed, watershed and state plans reviewed by state and federal agencies should be comprehensive (e.g., subwatershed plans developed for the Storm Water General Permit).
Requires periodic update of the transportation plan.	Subwatershed plans should be dynamic documents and updated periodically to parallel changes in subwatershed conditions.	State and federal plans should be updated based on changing conditions within jurisdictions.
Requires consistency of the plan/programs with the air quality plan.	Subwatershed plans should be consistent with other local government planning documents (e.g., master plans and ordinances), this Water Quality Management Plan and the watershed-wide plan.	State and federal watershed plans should be considered in the development of other plans within their jurisdiction (e.g., transportation plans, housing plans).

Appendix C
Total Maximum Daily Loads

Background

Under section 303 (d) of the Clean Water Act, states are required to identify surface waters that do not or are not likely to attain water quality standards, even after point sources of pollution have complied with at least the minimum technology-based requirements. Once these nonattainment waters have been identified, the states must establish and submit to the U.S. Environmental Protection Agency (USEPA) a priority ranking and schedule for the development of Total Maximum Daily Loads (TMDLs).

A TMDL enumerates the maximum level of a pollutant that a surface waterbody can receive and still meet water quality standards. The TMDL then distributes that acceptable pollutant loading among the various point and nonpoint sources for that pollutant. It should be noted that TMDLs are pollutant specific. Therefore, a single waterbody can have more than one TMDL, depending upon the pollutants contributing to its degradation.

The Michigan Department of Environmental Quality (MDEQ) has identified 268 waterbodies in Michigan requiring a total of 301 TMDLs. Michigan uses a five year rotating watershed approach for environmental monitoring and National Pollutant Discharge Elimination System (NPDES) permit reissuance. This five year cycle, along with several other criteria including USEPA's direction to have all TMDLs developed by 2011, was used by MDEQ to establish the development schedule (see Table C-1).

Southeast Michigan

Sixty-four of the 301TMDLs in the state are in Southeast Michigan, including waterbodies in all seven Southeast Michigan counties. The nonattainment waters in Southeast Michigan includes portions of both rivers and lakes. They range in size from 0.1 to 54 miles (rivers and streams) and between three and 1280 acres (lakes). Several TMDLs have already been completed; however, the majority are scheduled to be developed between 2000 and 2011 (see Table C-2).

Relationship to Plan

There are several difficulties associated with Michigan's TMDL program. First, MDEQ has acknowledged that it currently does not have adequate resources to meet the TMDL schedule. And even with adequate funding for the development of the identified TMDLs secured and

developed on schedule, the program does not provide mechanisms to enforce established loadings limits except through existing regulatory programs.

Table C-1 — Michigan Schedule for TMDL Development[5]

Year	Number of TMDLs	Year	Number of TMDLs
1999	17	2006	28
2000	12	2007	22
2001	15	2008	22
2002	6	2009	39
2003	18	2010	12
2004	20	2011	63[6]
2005	27		

Therefore, NPDES permits are the primary enforcement mechanism available to the MDEQ with regard to TMDLs. Yet the premise of the TMDL program is that nonpoint sources of pollution are frequently responsible for violations of water quality standards. Obviously, tightening permit limits on point source discharges is not, by itself, a reasonable strategy. Nor will it ensure that water quality standards are met. However, the regulatory authority to control nonpoint source pollution is not yet in place.

Recognizing this need, two of the primary focuses of this updated *Water Quality Management Plan for Southeast Michigan* are designed to address the full range of nonpoint pollution sources and the use of locally initiated watershed and subwatershed planning and implementation groups to ensure the achievement and protection of designated uses.

Several of the policies in the Plan and the TMDL process can complement each other, particularly the Watershed Management (see page 59) and Nonpoint Source Management policies (see page 67).

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[5] Michigan Department of Environmental Quality, May 1998, Staff Report, *Clean Water Act Section 303(d) List*.

[6] 59 of these are mercury lakes for which USEPA will take the lead in developing the TMDLs.

In an area where a TMDL has been developed, it can serve as a guide to communities in the development and implementation of nonpoint source control programs. In areas waiting for a TMDL to be developed, the subwatershed planning process could be used to ensure consideration of local concerns in the TMDL development or, perhaps, result in the achievement of water quality standards prior to the TMDL being established, negating the need for their development.

For example, under the Michigan Storm Water General Permit, municipalities must prepare a Watershed Management Plan and a Storm Water Pollution Prevention Initiative. In a nonattainment area, the management plan could identify the maximum pollutant loadings that the waterbody can receive and still meet water quality standards, as well as estimate the loadings from various sources and identify management strategies. The pollution prevention initiative could then ensure the implementation of appropriate management practices.

Table C-2 — TMDL Schedule for Southeast Michigan Waterbodies[7]

Stream/Lake Name	Year	Watershed
Livingston County		
Brighton Lake	1999	Huron
Thompson Lake	2009	Shiawassee
Bishop Lake	2011	Huron
Limeklin Lake	1999	Huron
Ore Lake	1999	Huron
Strawberry Lake	1999	Huron
Red Cedar	2003	Upper Grand
Big Portage Lake	2011	Huron
Macomb County		
Clinton River	2006	Clinton
Salt River	2005	Lake St. Clair
Deer Creek	2006	Clinton

[7]Institute of Water Research, Michigan State University, *Clean Water Act Section 303(d) List in Michigan*, http://www.gis.iwr.msu.edu/tmdl98/default.htm.

Stream/Lake Name	Year	Watershed
Crapaud Creek	2000	Lake St. Clair
Stony Creek	2007	Clinton
Bear Creek	2001	Clinton
Clinton River	2001	Clinton
Lake St. Clair – Memorial Beach	2001	Lake St. Clair
Lake St. Clair – Metropolitan Beach	2001	Lake St. Clair
Coon Creek	2001	Clinton
Red Run Drain	2001	Clinton
Monroe County		
N. Branch Amos Palmer Drain/Stony Creek	2004	Ottawa-Stony
River Raisin	2005	Raisin
River Raisin	1999	Raisin
Ottawa River	2007	Ottawa-Stony
Sandy Creek	2005	Ottawa-Stony
Wagner-Pink Drain	2005	Huron
Lake Erie – Luna Pier Beach	2007	Ottawa-Stony
Swan Creek	2005	Ottawa-Stony
Oakland County		
Lake Orion	2011	Clinton
Lower Trout Lake	2011	Clinton
Maceday Lake	2011	Clinton
Gallagher Lake	1999	Clinton
Cass Lake	2011	Clinton
Clinton River	2001	Clinton
Orchard Lake	2011	Clinton

Stream/Lake Name	Year	Watershed
Kent Lake	1999	Huron
Norton Creek	2009	Huron
St. Clair County		
Smith's Creek	2009	St. Clair
Mill Creek	2004	St. Clair
Black River	2009	St. Clair
St. Clair River	2009	St. Clair
Lake Huron – Burtchville Twp. Park	2005	Birch-Willow
Lake Huron – Metcalf Road Beach	2005	Birch-Willow
Lake Huron – Keewadhin Road Beach	2005	Birch-Willow
Lake Huron – Lakeport State Campground	2005	Birch-Willow
St. Clair River	2010	St. Clair
Washtenaw County		
Huron River	1999	Huron
South Lake	2011	Huron
Paint Creek	2005	Ottawa-Stony
Willow Run Creek	1999	Huron
Saline River	2000	Raisin
Honey Creek	2009	Huron
Allen Drain	2004	Huron
Mallet's Creek	2004	Huron
Horseshoe Lake Drain	2009	Huron
Swift Run Drain	1999	Huron
Lett's Creek	2004	Huron
Wayne County		

Stream/Lake Name	Year	Watershed
Tonquish Creek	2007	Detroit
Detroit River	2010	Detroit
Rouge River	2005	Detroit
Rouge River	2005	Detroit
Detroit River	2005	Detroit
Rouge River	2004	Detroit
Ecorse River – North & South Branch	2003	Detroit
Milk River	2005	Lake St. Clair

Appendix D
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Appendix E
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Great Lakes Commission
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Great Lakes Information Network
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Appendix F

Legislative and Regulatory Framework for Water Resource Protection

There is a wide range of legislation and regulations related to water quality. The table below lists the pertinent documents related to the text in this Water Quality Management Plan. Another supplemental chart that follows this table includes a list of additional references related to water resources protection.

Page	Related Plan Topic	Legislation/ Regulations	Citation	Description
7,19	Water Quality	Clean Water Act	33 U.S.C. §1251 (1977)	Established national framework for water pollution control. (The 1977 amendments to the Federal Water Pollution Control Act of 1972 are commonly referred to as the "**Clean Water Act**.")
8	Water Quality Planning and Manage-ment	Water Programs of EPA - Protection of Environment	40 C.F.R §130.12 (1999)	Details the relationship of the Water Quality Management Plan (WQM) with National Pollutant Discharge Elimination System (NPDES).
20	State environ-mental law	NREPA (Natural Resources and Environmental Protection Act)	1994 Mich. Public Act 451	Established state framework for water pollution control including necessary programs to implement federal law. Topics include point source, nonpoint source, waste management, remediation and habitat and wildlife protection.
29, 68	Trans-portation	Federal Transportation Equity Act of the 21st Century (TEA-21)	Public Law 105-178	Enacted June 9, 1998 as TEA-21, authorizes the federal surface transportation programs for highways, highway safety, and transit for the six-year period 1998-2003.

Page	Related Plan Topic	Legislation/ Regulations	Citation	Description
46	Water Quality	Michigan's Water Quality Rules	Mich. Admin. Code r. 323.1041-323.1117 (1979)	Establishes surface water quality standards for the Great Lakes and connecting waters.
46	Relation-ship bet-ween Plan and State	Wastewater Discharge Permits	Mich. Admin. Code r. 323.2136 (1979)	Requires point source discharge permits to be consistent with the Plan.
52	Regional Plans	Regional Planning Act	1945 Mich. Pub. Act. 281	Enables regional planning.
55	Update and Certificatio n of Water Quality Manage-ment Plan	Water Quality Management Plan	40 C.F.R. §130.6 (e) (1999)	Requires that Water Quality Management Plans must be changed to reflect changes in environmental conditions.
78	Soil Erosion and Sediment-ation	NREPA - Soil Erosion and Sedimentation Control Act	1994 Mich. Pub. Act 451, Part 91	Provides definitions and guidelines for soil erosion and sedimentation control and the creation of local programs.
82	Solid Waste Manage-ment	NREPA - Solid Waste Management	1994 Mich. Pub. Act 451, Part 115	Provides guidelines for regulating groundwater contamination from solid waste landfills. Includes definitions and guidelines for solid waste management.
82	State Hazardous Waste Manage-ment	NREPA - Hazardous Waste Management	1994 Mich. Pub. Act 451, Parts 111	Rules mandating a regulatory mechanism for cradle-to-grave management of hazardous waste. Includes definitions and guidelines for hazardous waste management.

Page	Related Plan Topic	Legislation/ Regulations	Citation	Description
82	Under-ground Storage Tanks	NREPA - Underground Storage Tanks, Leaking Underground Storage Tanks and Under-ground Storage Tank Financial Assurance	1994 Mich. Pub. Act 451, Parts 211, 213, 215	Legislation and regulations providing for the removal of leaking underground chemical storage tanks (USTs) and in setting strict standards for new facilities.
82	Incentives for cleanup of contam-inated sites	NREPA - Environmental Protection Bond Authority, Environmental Protection Bond Implementation, Clean Michigan Initiative Implementation	1994 Mich. Pub. Act 451, Parts 193, 195, 196	New enforcement tools and financial assistance programs that provide strong incentives for the clean up of contaminated sites and the promotion of economic development in previously depressed areas.
84	Air Pollution Prevention	Air Pollution Prevention and Control, (Clean Air Act Amendments of 1970 known as the "**Clean Air Act**")	42 U.S.C. §§ 7401 (1970)	Directs the EPA to establish national ambient air quality standards which are enforceable by the state through state implementation plans. The primary goal is pollution prevention.
88	Water Resources Protection	NREPA - Water Resources Protection	1994 Mich. Pub. Act 451, Part 31	Regulates point source pollution control to protect water resources. Definitions and guidelines for water resource protection.
100	Wetland Protection	NREPA - Wetland Protection	1994 Mich. Pub. Act 451, Part 303	Definitions and guidelines for wetlands protection. Includes state requirements for prohibited activities, regulation, permit application, ordinances and judicial review.

Page	Related Plan Topic	Legislation/ Regulations	Citation	Description
100	Shoreland Protection	NREPA - Shoreland Protection and Management	1994 Mich. Pub. Act 451, Part 323	Definitions and guidelines for protecting shorelands. Includes state requirements for management plans, permit requirements and inventorying.

Other Legislation, Agreements and Regulations Related to Water Quality Protection

Legislation/ Regulations	Citation	Description
Boundary Waters Treaty (1909)		Established the International Joint Commission between the United States and Canada. Requires Commission approval for certain uses, obstructions or diversions of waters along the boundary between the United States and Canada if such uses affect the natural levels or flows on the other side. Under the Treaty, the Commission also investigates and monitors specific transboundary issues when requested to do so by the governments.
Clean Michigan Initiative Act	Mich. Comp. Laws §§ 324.95101 - 95108; 1998 Mich. Pub. Act 284	Authorizes release of state bonds for cleanup and redevelopment of contaminated sites, improvement of water quality, prevent pollution, abate lead contamination, revitalization of waterfronts and cleanup sediment in lakes, rivers and streams.
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)	42 U.S.C. § 9601 (1980)	1980 legislation enacted to establish funds and address cleanup of abandoned hazardous waste. (In general, CERCLA deals with abandoned waste sites while RCRA governs active waste sites, also known as "**Superfund law**.")

Legislation/ Regulations	Citation	Description
Endangered Species Act of 1973 (ESA)	7 U.S.C. § 136;16 U.S.C. § 460 (1973)	Established affirmative laws to protect wildlife. Prohibits the import, export, taking or trading of any endangered or threatened species of fish or wildlife.
Federal Insecticide Fungicide Rodenticide Act (FIFRA)	7 U.S.C. § 135 (1972)	Requires that all pesticides be registered by the EPA and prohibits EPA from registering pesticides that have "unreasonable adverse effects on the environment."
Great Lakes Water Quality Agreements of 1972 and 1978	_____	United States and Canada agreed "to restore and maintain the chemical, physical, and biological integrity of the waters of the Great Lakes Basin Ecosystem." Established two joint institutions — the Great Lakes Water Quality Board (WQB) and the Great Lakes Science Advisory Board (SAB).
National Environmental Policy Act of 1969 (NEPA)	42 U.S.C. § 4321 - 4347 (1969)	NEPA is the basic national charter for protecting the environment. It establishes policy, sets goals and provides means for carrying out the policy.
Resource Conservation and Recovery Act (RCRA)	42 U.S.C. §§ 6901 (1976)	Replaced the language of the Resource Recovery Act. Ordered the EPA to create a regulatory program designed to provide cradle-to-grave control of hazardous waste. Also required the EPA to set standards for hazardous waste treatment, storage and disposal facilities.
Toxic Substances Control Act	15 U.S.C. § 2601 (1976)	Requires manufacturers to provide data on health and environmental affects of chemical substances and gives EPA authority to regulate manufacture, use, distribution and disposal of chemical substances.