

6. Challenges and Goals



“Water is the most critical resource of our lifetime and our children’s lifetime. The health of our waters is the principal measure of how we live on the land.”

-Luna Leopold

Introduction

As more and more people live, work and interact within a watershed, maintaining a healthy, sustainable environment becomes a challenge. To address these challenges, goals and objectives are developed to direct the actions within the watershed that will improve and protect the environment.

The purpose of this chapter is to:

1. Outline the water quality issues discussed in Section 4, summarize public and stakeholder concerns, and identify which pollutants are perceived to be of most concern.
2. Define designated uses and identify the impaired or threatened water bodies within the watershed that do not meet their designated uses.
3. Define and identify the watershed desires identified through the stakeholder workshops.
4. List the goals and objectives and identify how they were developed.



Photo courtesy of
Michigan State University, 2005.

Water Quality Issues and Concerns

It is important to distinguish between water quality issues and water quality concerns. Water quality issues are those water quality problems that have been identified through water quality monitoring, macroinvertebrate and fish sampling, and habitat surveys. Water quality concerns are problems that are observed or perceived to exist by residence and stakeholders within the watershed.

Water Quality Issues

Section 4 summarized data collected over a span of forty years in the Red Cedar River and Sycamore Creek. The results show that a variety of impacts have been identified; and many are still present in these water bodies.

Analytical sampling has identified Dissolved Oxygen (DO) as a substantial issue in both the Red Cedar and the Sycamore Creek. Additionally, pathogens have also been found to impact the water quality of the Red Cedar.

Biological studies found populations and diversity of fish and macroinvertebrates decreasing in a downstream direction in the Red Cedar River. Biological studies within the Sycamore Creek, likewise, found decreased populations and diversity of fish and macroinvertebrates. However, the decrease was limited to the headwaters.

Based on these studies, a number of Water Quality Standards (WQS) violations have been identified in the watershed. These impaired waterbodies are assigned a date to implement a Total Maximum Daily Load (TMDL) management strategy to address the violation and ultimately restore the water quality. The impaired waterbodies and the TMDL dates were presented in Table 4-3.

Water Quality Concerns

Water quality concerns were solicited from the public and stakeholders through a series of workshops and meetings, described in Section 5.

A list of the public's concerns is provided below.

- Pollution of Cedar Street Lake
- High turbidity levels in local waterways
- Septic system overflows and failures
- Fish contamination
- Waterfowl impacts
- Bacteria and *E. coli* contamination
- Pollutants
- Invasive species
- Education of citizens
- Inadequate tree management/log jams in local waterways
- Trash/dumping of yard waste into river
- Flooding
- Existing negative or non-interested attitudes regarding river costs and who will pay
- Lack of interest or awareness
- Rising development pressure across the watershed
- Lack of recreational opportunities, swimming
- Low quality fishing
- Water quality concerns on MSU campus
- Hydrological flashiness – peak flows and relationship to Combined Sewer Overflows

The concerns identified by the stakeholders are ranked and presented below. The concerns were ranked by the stakeholders to determine which issues they felt were more important.

1. Turbidity/solids load after a runoff event
2. Education
3. Finding proper funding
4. Impact on groundwater/water quality
5. Bacteria/illicit discharges
6. Public Awareness
7. Lawn care/fertilizers and pesticides and pet waste
8. Lack of recreational use/fishing
9. Communication issues
10. Development
11. Dumping of grass clippings, leaves, and litter
12. Road salt runoff
13. Lack of enforcement
14. Erosion/runoff
15. Waterfowl contamination
16. Attain Clean Water Act goals and objectives
17. Public access to waterways
18. Loss of wetlands
19. Septic system failures



Red Cedar River Watershed Stakeholder Meeting Photo Courtesy of Tetra Tech, June 2005



Source: NCSU, 2004.

Designated Uses in the State

The Michigan Department of Environmental Quality (MDEQ), acting under authority of the federal Clean Water Act, aims to make waters in the state meet certain designated uses (State of Michigan, 1999):

- Agricultural Water Supply
- Industrial Water Supply
- Public Water Supply
- Warmwater Fishery
- Other Aquatic Life / Wildlife
- Partial Body Contact
- Coldwater Fisheries (specifically identified waterbodies only)
- Total Body Contact (May 1st – October 31st)
- Navigation

The designated uses are intended to:

- Protect health and public welfare
- Enhance and maintain the quality of water
- Protect the state's natural resources
- Meet the requirements of state and federal law (including international agreements)

One of the first things people envision when discussing water quality is drinking water. It is extremely important for communities to have a clean source of drinking water that is free from contaminants.

Communities in the subwatershed use groundwater for drinking water supplies, and although the designated uses apply to surface waters, the uses also help protect groundwater drinking supplies because these two water sources are implicitly linked.

Contaminants in water can also affect human health when the water is used to irrigate food sources, when fish living in these waters are eaten, or when humans come in contact with these waters through swimming or boating.

While human health is the most important reason for protecting these resources, the designated uses are also intended to protect wildlife, commerce, and recreation. For example:

- The “warm water and cold water fisheries” uses also ensure healthy fish populations, increases recreational enjoyment of fishing, and ensures a thriving fishing industry that results in fishing related consumer spending, travel, and tourism.
- The “industrial water supply” use ensures that businesses have an inexpensive and sustainable process water supply that helps keep them competitive and providing jobs to Michigan's citizens.
- The “navigation” use ensures that the state's waterways are passable and the “body contact” use ensures that people can safely swim. These uses contribute to the lure of many travelers vacationing during the summer.

The coldwater fishery use does not apply to any waters within the watershed as none have been designated as such by the MDEQ.

What are “designated uses”?

- They are recognized as important uses for waterbodies that are protected by state and/or federal regulations.
- They are defined in Rule 100 of MDEQ Administrative Rules under authority of the Natural Resources and Environmental Protection Act (Public Act 451 of 1994, Part 31)

Example Pollutants Affecting Designated Uses

Agricultural Water Supply

- Hydrology (too little flow)
- Excess nutrients
- Toxic contaminants

Industrial Water Supply

- Hydrology (too little flow)
- Suspended solids

Public Water Supply

- Excess nutrients (nitrates)
- Pesticide contaminants

Warm Water Fishery

- Sediment
- Hydrology (flow variability)
- Dissolved oxygen (too little)

Cold Water Fishery

- Sediment
- Hydrology (flow variability)
- Dissolved oxygen (too little)

Other Aquatic Life / Wildlife

- Sediment
- Pesticides
- Temperature

Partial Body Contact

- Pathogens
- Nutrients

Total Body Contact

- Pathogens
- Nutrients

Navigation

- Obstructions

Source: MDEQ, 2000.

Designated Uses Not Being Met

As a result of the State's defined designated uses and the water quality data and impairments discussed in Section 4, the following designated uses are not being met:

- **Warm Water Fishery and Other Aquatic Life and Wildlife** are impaired in the Red Cedar River, from the Grand River confluence upstream to Kalamazoo Street, and in the Sycamore Creek. The impaired designation in the Red Cedar River is due to exceedances for DO, fish kills, and poor fish and macroinvertebrate communities. The impaired designation in the Sycamore Creek and several tributaries is due to exceedances of water quality standards for DO.
- **Total and Partial Body Contact** is impaired in the Red Cedar River from the Grand River confluence upstream to Kalamazoo Street due to CSO discharges (pathogens).

Threatened Designated Uses

Additionally, the following designated uses are being met but are threatened (meaning they may not be met in the foreseeable future):

- **Warm Water Fishery, Other Aquatic Life and Wildlife, and Navigation** are threatened in the Sycamore Creek due to excessive sedimentation, especially within the headwaters. The sediment was identified as a pollutant causing the reduction of DO. All other inland lakes, reservoirs and impoundments are threatened by the presence of PCBs and / or mercury in fish material (implying the potential for these pollutants to bioaccumulate in other organisms).

Meeting the state-defined designated uses is important to meet legal requirements to protect public health, provide a high quality of life, and protect natural resources. Programs such as the MDEQ TMDL program seek to obtain the restoration of these uses with the ultimate goal of restoring and maintaining the chemical, physical, and biological integrity of the state's waters.

It is important to note that the assessments presented herein are subject to change. Additional data, new pollution sources, changing use locations, and updated water quality standards all may affect the assessment. Waterbodies may be listed or de-listed on Michigan's 303d or 305b list, and the associated status of designated uses may change.



Source: ICD, 2005.

Watershed Desires

The term “watershed desire” is meant to invoke a vision of what watershed stakeholders would like their watershed to look like. The watershed planning committee members and the stakeholders have participated in determining goals and desires for the watershed, such as, developing a recreational trail along the river.

During the public participation process, the public was given the opportunity to express their watershed desires. The public identified the following watershed desires:

- Target lawn care companies, turf grass industry and the public on proper lawn fertilizer applications through education/recognition practices
- Increase community involvement through public education
- Increase river corridor status for restaurants and businesses



Photo courtesy of
Friends of the Looking Glass River

Likewise, the stakeholders were also given an opportunity to develop a list of watershed desires. This list was prioritized by the stakeholders and is provided below:

1. Swimmable and fishable waters
2. Education
3. Public support to allow funding
4. Change public perception
5. Upstream extension of river trail
6. Reduce pollutant loading during runoff
7. More events that include the River/Red Cedar Group
8. Coordination with water protection programs
9. Riverfront development
10. Protect drinking water supply
11. River clean-up day
12. Determine and target largest polluters
13. Prioritize what public should do
14. Meet mandated deadlines
15. Red Cedar public website development
16. Label watershed entry points
17. Control waterfowl protection
18. Better fertilizer/pesticide management
19. Water conservation

Goals and Objectives

A mission statement was developed by the watershed committee during the initial stages of The Public Participation Plan implementation. The mission is:

Improve Water Quality in the Red Cedar River Watershed

Using this mission statement along with the identified known pollutants and watershed desires, a set of goals and objectives was developed. The goals reflect the mission statement and are accompanied by a set of objectives and actions which when implemented will assist in meeting the corresponding goal. The actions associated with these objectives are listed in Section 8.

In addition to considering the desires of the public and stakeholders during goal and objective development, permit requirements were also considered. The watershed management plan as a whole must contain the following: (See Part I.B.1 of the permit in Appendix C).

- An assessment of the nature and status of the watershed ecosystem (Section 3 and 4)
- Long-term goals to include the protection of designated uses of the receiving waters and compliance with TMDLs (Sections 6 and 8)
- Short-term objectives (Sections 6 and 8)
- Action items to achieve goals and objectives (Section 8)
- The benefit and cost of the action items (Section 8)
- A responsible party, schedule, and evaluation mechanism for each action item (Section 8)

Minimum Permit Requirements

The objectives in this plan meet the Watershed-Based NPDES Permit requirements, but because of the significant public and stakeholder response, many additional objectives are included in the plan to expand on voiced desires. These additional objectives go beyond the minimum requirement of the permit.

Because the Watershed-Based NPDES Permit has broad requirement language, and because of the implication that any implemented objective, directly or indirectly, must help protect the designated uses of the receiving water body, it was necessary to include the minimum requirements from other sources. These sources include the U.S. Environmental Protection Agency (US-EPA) Storm Water Phase II Final Rule requirements and the Michigan Jurisdictional-Based NPDES Permit. These two sources were chosen because the Watershed-Based NPDES Permit is based on their requirements. The US-EPA Storm Water Phase II and Jurisdictional-Based NPDES Permit requirements establish six minimum measures.

Each minimum measure requirement as well as each specific Watershed-Based NPDES Permit requirement was reviewed to assure that at least one objective correlated with it. In the section below, each goal is prioritized according to what stakeholders deemed important. Objectives are included in the table under each goal. A 'Yes' indicates that the objective fulfills one or more permit requirements at a minimum level. A 'No' indicates that the objective is considered beyond the minimum requirement of the permit, or that it extends a general effort beyond the minimum requirement of the permit, and may be eligible for certain types of grant funds. During goal and

US-EPA's Six Minimum Measures

Public Education and Outreach

- Distribute educational materials or conduct outreach

Public Involvement/ Participation

- Comply with state, tribal, and local public notice requirements

Illicit Discharge Detection and Elimination

- Map waters of the state and the outfalls that discharge to them
- Legal authority to prohibit non-storm water discharges
- A plan to detect and address non-storm water discharges
- Educate staff, businesses, and public about illicit discharges

Construction Site Runoff Control

- Regulate compliance with proper soil erosion/ sediment control
- Review site plans that have potential for water impacts
- Conduct site inspection and enforcement
- Receive/consider information submitted by public

Post-Construction Storm Water Management

- Implement strategies to include structural/non-structural BMPs
- Require usage of post-construction controls
- Ensure long-term O&M controls

Pollution Prevention/Good Housekeeping

- Prevent/reduce pollutant runoff from municipal operations
- Train employees on pollution prevention/good housekeeping

Source: US-EPA, 2000

objective development, it became clear that some objectives fulfill minimum requirements, some objectives go beyond the minimum requirements, and some objectives are difficult to categorize. Discretion was used to determine how the uncategorical objectives are classified.

Note that each goal and objective should be considered in association with other goals and objectives, as applicable. For example, Goal 1 is focused on educating the public on many different topics. These education efforts will be coordinated with efforts included in the remaining goals as much as practicable to provide the greatest benefit.

Goal 1: Educate the Public about the Importance of Protecting and Managing the Watershed.



Source: KSU, 2005

The aim of Goal 1 is to develop an aggressive multi-media public education plan to define watersheds and storm water, encourage homeowner stewardship, and advertise watershed events targeted at the general public, stakeholders, municipal officials and planning boards.

While many of the Goal 1 objectives fulfill the minimum Phase II Permit requirements, several go beyond the minimum requirements and are indicated as such. Specifically, the Goal 1 objectives fulfill Part I.A.3.b of the Watershed-Based NPDES Permit. Objectives under this goal will be incorporated into updated Public Education Plans (PEP). The objectives of the education plan recognize that multiple public entities exist, often with specific needs and requiring more tailored educational efforts. Therefore, the objectives have been grouped under three categories intended to reflect the different publics targeted by the PEP. This more focused approach will allow for better connectivity between the identified watershed issues and concerns and the education programs. The three categories are:

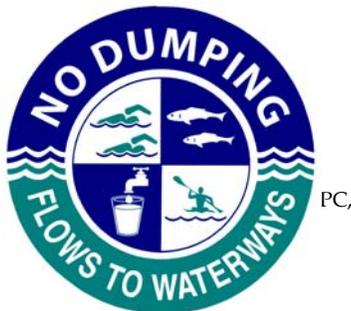
- Youth Programs (K-12);
- General Public Education;
- Business/Restaurant Education.

Youth Programs (K-12)

<u>Objective</u>	<u>Required*</u>
1a School Education: Assist local school districts in developing a science curriculum on watershed studies.	Yes

General Public Education

<u>Objective</u>	<u>Required*</u>
1b Public Participation: Develop and maintain Storm Drain Marking. Provide routine updates to the general public, the stakeholders and the municipal officials.	Yes
1c Support participation in Adopt-A-River program.	Yes
1d Develop an educational campaign to encourage preservation and reestablishment of native riparian vegetation and to emphasize the importance of wetlands in the community.	Yes
1e Homeowner Education: Develop an educational campaign for maintenance and operation of on-site sewage disposal systems, household hazardous waste, lawn maintenance, automobile maintenance, and private wellhead protection for all homeowners.	Yes



- 1f Maintain GLRC Public and Project Web Site. Yes
- 1g Public Participation: Develop a community based volunteer group and train them to assist with watershed-wide actions such as stream corridor inventories and road stream crossing and publicize the results. No
- 1h Update Public Education Plan (PEP) to reflect this WMP. Yes

Business & Restaurant Education

<u>Objective</u>	<u>Required*</u>
1i Business Education: Salt application, good housekeeping of parking lots and grounds, oil/grease disposal, cleaning agent use.	Yes
Restaurant Education: No Grease in Storm Drains	

*The 'Required' column indicates whether an objective is required under the Phase II Permit.

Goal 2: Provide a Sustainable and Equitable Funding Source

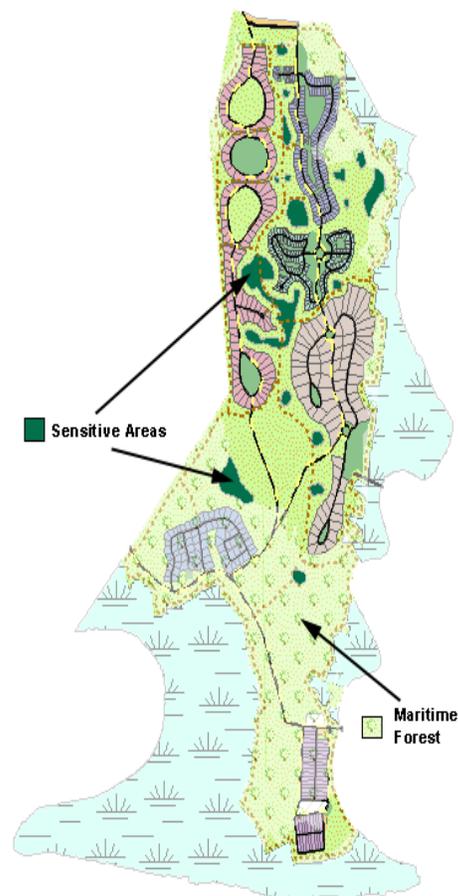
For any plan to be fully implemented and sustained for the long-term, a funding source must be identified. In fulfillment of this goal, it is anticipated that a funding sub-committee will be coordinated to establish budget needs and funding mechanisms.

<u>Objective</u>	<u>Required*</u>
2a Develop and adopt a funding strategy to support the WMP.	Yes

Goal 3: Encourage Water Quality Friendly Development

Many of the Goal 3 objectives are aimed at fulfilling Storm Water Pollution Prevention Initiative (SWPPI) requirements from Part I.B.2 of the Watershed-Based NPDES Permit. The permit requires the “development, implementation, and enforcement of a comprehensive storm water management program for post-construction controls for areas of new development and significant redevelopment.” Goal 3 objectives aim to prevent or minimize the effects of urbanization on water quality through ordinances, planning, and long-term operation and maintenance requirements for controls.

<u>Objectives</u>	<u>Required*</u>
3a Promote intergovernmental coordination and cooperation for Water Quality Friendly Development practices which includes wetland and waterbody setbacks.	Yes
3b Develop a development standards manual which outlines economically viable Water Quality Friendly Development practices.	Yes
3c Improve ordinance enforcement of all watershed-related ordinances such as Illicit Discharge Elimination Program (IDEP), waste disposal, and wetland protection.	Yes
3d Incorporate Water Quality Friendly practices into land use, zoning, and community development master plans.	Yes
3e Implement watershed-wide septic system inspection and abandoned well closure inspection in conjunction with local health agencies.	Yes
3f Facilitate the completion of at least one demonstration project	No



Site Planning
Source: NOAA, 2005

within the watershed using low impact development standards.

- 3g Retrofit areas of high impervious cover with stormwater BMPs to decrease imperviousness. Look for ways to coordinate with groundwater protection and cooperate on grant applications. No
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Goal 4: Restore and Enhance Recreational Uses through Development of a Watershed Recreation Plan



Source: LOAPC, 2004

Goal 4 was developed primarily in response to public input. During the public meetings, many people indicated that they would like to see rivers restored, enhanced, and/or protected so that recreational activities can be enjoyed for the long-term. "Partial Body Contact Recreation" and "Total Body Contact Recreation between May 1 and October 31" are designated uses of surface waters that the individual watershed communities are required to protect. The communities would like to restore, enhance, and protect recreation in their waterways as much as practicable, but they recognize that this is a long-term goal that involves the implementation of this WMP as a whole. Therefore, most of the Goal 4 objectives are considered objectives that go beyond the Phase II permit requirements, save the ongoing task of coordinating efforts to remove trash and debris from the rivers.

<u>Objectives</u>	<u>Required*</u>
4a Research deadfall management techniques and adopt a management plan.	No
4b Restore fishing opportunities in the watershed. Look at both accessibility and habitat.	No
4c Add at least one canoe landing along the Looking Glass River, Red Cedar River, or Grand River.	No
4d Recreational Assessment: Examine the river and stream corridors and construct additional access sites, river trails, and observation decks to improve walking, fishing, and observation opportunities.	No

Goal 5: Protect and Enhance Habitat for Wildlife and Aquatic Animals through Development of a Watershed Habitat Plan

Similar to Goal 4, Goal 5 was developed in response to the public’s desire to protect and enhance wildlife including aquatic animals. “Warm Water Fisheries” and “Other Indigenous Aquatic Life and Wildlife” are designated uses of surface waters that the individual watershed communities are required to protect. The communities rely on the successful implementation of this WMP to protect these designated uses. Therefore, most of the Goal 5 objectives are considered objectives that go beyond the Phase II permit requirements.



Photo courtesy of Clinton River Watershed Council

<u>Objectives</u>	<u>Required*</u>
5a Conduct an inventory of the stream corridors and identify existing riparian buffers and shade cover over streams. Also, identify areas of eroding stream banks and excessive sedimentation. Identify potential sources and rank in order of importance for restoration.	No
5b Protect and Enhance Habitat for Wildlife and Aquatic Animals through Development of a Watershed Habitat Plan.	No
5c Consider restoration or purchase of key wildlife habitat areas based on the management plan.	No

Goal 6: Protect and Increase Wetlands through Development of a Watershed Habitat Plan

Communities would like to protect and increase wetlands as much as practicable and recognize that successful implementation of the WMP is needed to do this. Although the watershed committee is committed to protecting wetlands as part of Goal 3, all Goal 6 objectives go beyond the requirements of the Phase II program.



Photo courtesy of Tetra Tech, 2005

<u>Objectives</u>	<u>Required*</u>
6a Inventory wetlands within the watershed and determine the general health of wetlands, primary impacts and sources of these impacts.	No
6b Develop and adopt wetland protection measures.	No
6c Implement advanced wetland restoration/protection measures.	No

Goal 7: Provide Pollution Prevention/Good Housekeeping Practices for Municipal Operations

Similar to Goal 3, Goal 7 objectives focus on fulfilling SWPPI requirements from Part I.B.2 of the Watershed-Based NPDES Permit. The permit requires specific activities to be conducted under this section including the following:

- 1) Maintenance and inspection plans for structural controls;
- 2) Controls to reduce/eliminate pollutants from roadways, parking lots, and maintenance garages;
- 3) Procedures for proper disposal of operation and maintenance waste;



Source: Hamilton, 2005.

- 4) Ways to ensure the flood management projects assess the impacts of water quality; and
- 5) Controls to reduce the discharge of pesticides and fertilizers in the permittee's regulated area.

The permit also calls for a training and inspection program for staff and contractors. As part of many of these objectives, training will be conducted as outlined in the action plan table in Section 8.

<u>Objectives</u>	<u>Required*</u>
7a Ensure that ordinances and Standard Operating Procedures (SOP) comply with Phase II permit requirements.	Yes
7b Review municipal pesticide and fertilizer application procedures for municipally-owned property. Ensure that directions are followed, low-phosphorus fertilizers are used, and soil testing is conducted to determine fertilizer need.	Yes
7c Provide maintenance activities and inspection procedures for permanent structural storm water best management practices (retention basins, swales, created wetlands, rain gardens, etc.).	Yes
7d Assess the impacts on water quality from flood management projects.	Yes
7e Reduce discharge of pollutants from streets, roads, highways, parking lots, and maintenance garages.	Yes
7f Dispose of operation and maintenance waste from the separate storm water drainage system appropriately. This includes street sweeping, catch basin cleaning, dredge spoil, sediments, floatables, and other debris.	Yes
7g Add or revise municipal ordinances to require low or no phosphorus fertilizer for both business and residential use.	No
7h Ensure that excess salt is not being spread in watershed. (coordinate with Obj. 1i and Obj. 7e)	No
7i Remove trash and debris from river. Coordinate with O&M Departments to plan for events that result in excessive trash and debris, such as festivals, street fairs, and football games.	Yes
7j Adopt stream and ditch management techniques for channel rehabilitation focused on drains and open ditches.	Yes



Photo courtesy of Tetra Tech, 2005

Goal 8: Strive to Eliminate Pathogens to Meet Total and Partial Body Contact for Recreational Uses

Individual watershed communities will strive to eliminate pathogens discharging to waterbodies primarily through their Illicit Discharge Elimination Plan (IDEP). Developing and implementing an IDEP, a plan that is approved separately from this WMP, is a requirement of Part I.A.3 of the Watershed-Based NPDES Permit.

Minimization and/or management of sanitary sewer overflows (SSOs) and combined sewer overflows (CSOs) is a targeted objective that came out of public and stakeholder involvement. SSO and CSO management is not a requirement of the Phase II program, so any actions taken for this objective are not part of this permit. Alternatively, actions are taken under a separate permit and are managed by other agencies within the communities.

Objectives

Required*

- | | | |
|----|--|-----|
| 8a | Minimize and/or manage sanitary sewer overflows (SSOs) and combined sewer overflow (CSOs). | No |
| 8b | Conduct an illicit discharge removal program including: finding problems by checking for leaking sanitary systems, leaking septic systems, and illicit connections; removing the source of the problem and prohibiting their reoccurrence through municipal code and ordinances. | Yes |
-

Goal 9: Encourage Water Quality Friendly Agricultural Practices

Agricultural practices have the potential to contribute large amounts of runoff laden with sediment, nutrients, and other compounds harmful to our rivers and streams. Recognizing this as a problem, Stakeholders and the Public have requested that this goal be added to the WMP. Implementation of agricultural BMPs is not a requirement of the Phase II Program. Therefore, the Goal 9 objectives are considered objectives beyond the requirement of the Phase II permit.

Objectives

Required*

- | | | |
|----|---|----|
| 9a | Promote and support the existing agricultural program and encourage water quality friendly practices. Focus on creating incentives. | No |
| 9b | Support annual community meetings on agriculture in the watershed. | No |
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Details surrounding the watershed objectives are included in Section 8 of this WMP. Although the objectives are intended to help meet the goals, an iterative process of implementation and evaluation is required to assess the effectiveness of the objectives. Refer to Section 9 for more discussion on evaluation mechanisms.



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References

- DAS Manufacturing. "Curb marker graphic." via <http://www.dasmanufacturing.com/storm/>. Last accessed February 28, 2005
- Hamilton, City of, Ontario, Canada. "Street sweeping photo." via <http://hamilton.ca/public-works/Fleet-And-Facilities/Fleet-Services/default.asp>. Last accessed May 23, 2005.
- Ingham Conservation District (ICD). "Row boat photo." via <http://www.inghamconservation.com>. Last accessed February 28, 2005.
- Kent State University (KSU). "River clean-up photo." via <http://www.kent.edu/images/river.jpg>. Last accessed May 23, 2005
- Lansing Oar and Paddle Club (LOAPC). "Canoeing photo." via <http://www.loapc.com>. Last accessed February 28, 2005
- Michigan Department of Environmental Quality Water Division. "Developing a Watershed Management Plan for Water Quality: An Introductory Guide." 2000.
- Michigan Waterfowl. "Wetland habitat photo." via <http://www.michiganwaterfowl.com>. Last accessed February 28, 2005.
- National Oceanic and Atmospheric Association (NOAA). "Site plan illustration" via <http://www.csc.noaa.gov/alternatives/conservestatic.html>. Last accessed May 24, 2005.
- North Carolina State University (NCSU). "Picture of boy drinking water." via <http://www2.ncsu.edu/ncsu/CIL/WRRI/annual/0203SDWA.html>. Last accessed December 15, 2004.
- State of Michigan. "Michigan Administrative Code." Part 4. Last Revised: April 2, 1999
- United States Environmental Protection Agency (US-EPA). "Storm Water Phase II Final Rule Fact Sheet Series." Publication 833-F00-005. January 2000.
- United States Environmental Protection Agency (US-EPA). "Smart growth definition." via http://www.epa.gov/smartgrowth/about_sg.htm. Last accessed May 25, 2005.

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