

Total Maximum Daily Load (TMDL) Implementation Plan for the Huron River Watershed MS4s in Washtenaw County

Updated March 29, 2023

The Michigan Department of Environment, Great Lakes, and Energy (ELGE), under the National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permit application, requires a plan or other documentation outlining how each Municipal Separate Stormwater Sewer System (MS4) will "make progress toward achieving the pollutant load reduction requirement" in each TMDL listed in each applicant's application notice. The purpose of this document is to provide the collective watershed plan for addressing relevant TMDLs in the Huron River Watershed in Washtenaw County by MS4s for the purpose of stormwater permit compliance. This document addresses the permit application sections relating to TMDLs.

I. TMDL and MS4 Coverage

This TMDL plan is submitted on behalf of the following Phase I and II MS4s within the Huron River Watershed, for each of the below-listed TMDLs:

A. *Excessive nutrients (phosphorus) and algae in Ford Lake and Belleville Lake*

City of Ann Arbor	Ypsilanti Charter Township
Ann Arbor Public Schools	Washtenaw County Water
Barton Hills Village	Resources Commissioner
City of Dexter	Washtenaw County Road
Eastern Michigan University*	Commission
Pittsfield Charter Township	University of Michigan
City of Ypsilanti	VA Ann Arbor Healthcare System

* Eastern Michigan University does not have its own permit, but is nested under the City of Ypsilanti

B. *Excessive bacteria (E. coli) in the following areas based on specific TMDLs or the statewide TMDL:*

- *Huron River and tributaries downstream of Argo Dam to Geddes Dam*
- *Honey Creek*
- *All other tributaries in Washtenaw County except direct drainages to the Huron River down to the Barton Dam (statewide)*

City of Ann Arbor	Washtenaw County Road
City of Dexter	Commission
Ann Arbor Public Schools	University of Michigan
Pittsfield Charter Township	VA Ann Arbor Healthcare System
Washtenaw County Water	
Resources Commissioner	

C. *Aquatic biota impairment in Malletts Creek*

City of Ann Arbor
Ann Arbor Public Schools
Pittsfield Charter Township
Washtenaw County Water
Resources Commissioner

Washtenaw County Road
Commission
University of Michigan

D. *Aquatic biota impairment in Swift Run*

City of Ann Arbor
Ann Arbor Public Schools
Pittsfield Charter Township
Ypsilanti Charter Township
Washtenaw County Water
Resources Commissioner
Washtenaw County Road
Commission

II. Prioritizing and Implementation BMPs

The MS4s in the Middle Huron River Watershed have put forth substantial effort and resources to reduce the sources of impairments related to the TMDLs listed in the previous section. These partner organizations, along with non-MS4 entities have developed a number of general and specific plans to address watershed impairments. These plans direct the current and future project and program priorities. The suite of projects and programs already put in place contributed to significant impairment reduction, as evidenced by data collected through on-going monitoring (see Appendix A for details).

To comply with NPDES stormwater permit requirements, the above-listed MS4s submit that the suite of Best Management Practices (BMPs) contained in the tables below and attached represents each MS4's initial project priorities that will be implemented to collectively make progress toward achieving each of the TMDL pollutant load reduction targets. The attached table of BMPs identifies the targeted TMDL pollutants (i.e. phosphorus, sediments, or bacteria where relevant) and the priority of the BMP. In many cases, no additional prioritization is needed, as the activity is a general (G) stormwater treatment BMPs and will be applied across the MS4 and watershed, and not specific to a particular drainage or impairment. For those BMPs that are area or pollutant specific, data from the monitoring program will be used to help establish priorities for implementation. In these cases, BMPs are classified as high (H), medium (M) or low (L) priority for each TMDL. The high priority BMPs will first be implemented in creeksheds or drainage areas that are determined (through monitoring) to be greater sources of the TMDL pollutant or impairment. Conversely, medium and low priority BMPs will be implemented in these TMDL-pollutant source areas after high priority BMPs are implemented.

Some of this prioritization derived through monitoring has already been accomplished. As such, specific projects or areas have been identified and prioritized for each impairment. Those specific priority projects are included in the table below. The table was originally developed for the Middle Huron River Watershed Management Plan, Section 2 (WMP). That plan is being used as a project planning tool and includes details about specific priority areas, including maps. Please refer to that plan for reference. Additional activities are identified in the WMP, but the ones below are high priorities, and descriptions following the table represent the collaborative commitments of middle Huron MS4s.

Table 1. Summary of Priority TMDL Implementation Strategy for Stormwater

Activity	Impairment / Source Reduced	Participating Organizations	Success Measures
Top Priority Activities			
1. Develop a Green Stormwater Infrastructure strategy and program	All/ Runoff	HRWC, Municipalities, UM, AAPS	Increased baseflow and reduced flow variability; reduced nutrient and bacteria concentrations and loading; monitoring
2. Enforce restrictions of new discharge permits in TMDL	Phosphorus / new sources	HRWC, partners	No newly permitted dischargers of phosphorus effluent
3. Enforce rules, standards and ordinances for stormwater management	All/ new stormwater	Municipalities	Reduced runoff and nutrient/bacteria concentrations; monitoring
4. Implement the Information and Education Strategy	All/ Multiple	HRWC, all partners and residents	Impairment knowledge from survey; participation rates, monitoring
5. Inspect, maintain and clean stormwater system	All/ stormwater	Municipalities, UM, AAPS, WCRC	Problems corrected; sediment removed; wildlife removed
6. Conduct bacterial source identification in priority areas	Bacteria/ multiple	HRWC, Municipalities	# human sources IDed; remediation plans; reduced bacteria concentrations
7. Pet waste ordinance education	Pathogens/ Pet waste	City of Ann Arbor	Resident knowledge from survey; call volume
8. Continue active management of Ford Lake	Phosphorus / internal lake	Ypsilanti Township	Reduced algae bloom count; low DO management events

1. Green Stormwater Infrastructure Strategy & Program

HRWC developed a process to incorporate available geographic, aerial and other remotely collected information to identify opportunities for Green Infrastructure projects for stormwater treatment (GSI).¹ It includes a map of GSI opportunities in the watershed. Opportunities are identified for streets, large lots and roofs. Other GSI opportunities assessments have been developed. Projects and programs already exist in the watershed, such as Washtenaw County’s

¹ Huron River Watershed Council. 2014. Green Infrastructure Opportunities. <https://www.hrwc.org/our-watershed/protection/surrounding-land/green-infrastructure/green-infrastructure-ops/>

residential Rain Garden Program,² the City of Ann Arbor's Green Streets policy, and numerous public and private GSI projects that are inventoried across the county. Hundreds of projects have been identified of many types including residential rain gardens, community rain gardens, native restoration, green roofs, and infiltration practices.

The commitment for this effort will be for HRWC to work with MS4s to develop a strategy to identify target locations that combine TMDL critical areas and available opportunities for GSI retrofit designs along key roads or other publicly-owned properties, as well as large business properties. Public properties will be further prioritized. This strategy would promote the use of designs that slow and settle runoff waters from impervious surfaces like roads, drives and sidewalks and infiltrate as much of the runoff as possible. Slowing run-off waters will reduce stream flashiness, addressing the top long-term goal of reducing flow variability in the Watershed. This also allows a greater portion of runoff to be filtered through the ground, removing pollutants, before reaching groundwater, where bacteria will not reproduce, thus reducing stormwater runoff sources of contamination. Research on bacteria reduction indicates that few structural BMPs work to significantly reduce bacteria levels in stormwater runoff. However, properly designed detention or retention basins have been shown to reduce bacteria in outflow. Existing detention ponds and stormwater systems in critical areas of the watershed should be evaluated for retrofit opportunities to capture, settle and treat stormwater runoff, as well. Implementation of priority GSI projects will initially be done on an opportunistic basis as resources allow, and progress will be evaluated before identifying specific commitments in future permit applications. HRWC will also report monitoring results annually and update priority areas for GSI implementation.

2. Enforce restrictions of new discharge permits in the nutrient TMDL area

The TMDL for Ford Lake and Belleville Lake concludes that there is excess phosphorus entering the lakes from current sources. The policy establishes phosphorus loading limit goals for all identified sources as well, and in some cases states how EGLE staff believe that the sources can be reduced to the stated goals. These targets are then used as guidelines to set limits within NPDES discharge permits. Given that the lakes exceed the TMDL, the addition of new phosphorus sources within the TMDL watershed would be counterproductive. It is imperative to the success of all the phosphorus reduction activities going forward that no new sources be added to counteract these nutrient reduction efforts. To prevent new sources from being added, HRWC and MS4s commit to participate fully in public response to new permit applications. In this public response, the partners will request that EGLE give full consideration of the effort made within the watershed to control existing phosphorus sources and uphold the goals of the TMDL by rejecting any new source permits.

3. Enforce rules, standards and ordinances for stormwater management

This program helps reduce the pollutant concentrations and bacteria in surface water by preventing flooding, modulating flow, treating storm water, and discouraging geese by using native landscape buffers near waterways and ponds. Washtenaw County's program provides likely the greatest protection from stormwater impacts from new development and redevelopment projects across the state. The current standards and rules require infiltration of storms up to the bankfull event, in most cases, and controls flow to pre-development rates. Most municipalities in the county have adopted stormwater ordinances which refer to the Water Resources Commissioner's stormwater standards. The city of Ann Arbor, and Ann Arbor Township have their own standards and review process, both of which are more protective

² Washtenaw County Water Resources Commissioner. Undated. Rain Gardens. <https://www.washtenaw.org/647/Rain-Gardens>.

overall. WRC or municipal staff review development proposals to ensure they meet WRC or municipal standards. Projects that do not meet standards must be redesigned or adjusted in order to receive municipal building permits.

4. Implement the Information and Education Strategy (Public Education Plan)

Municipal and agency partners developed a Public Education Plan (PEP), as part of compliance with stormwater regulations and to address public sources of impairments. The PEP includes 22 activities and strategies to address nine stormwater topics identified by EGLE. Further, the PEP includes activities to address all TMDL impairments. It also includes a strategy to evaluate the success and progress of education measures. The collaborative PEP was submitted as a separate document. HRWC and Partners will review the PEP annually alongside monitoring results to determine if any activities should be targeted to TMDL priority areas.

5. Inspect, maintain and clean stormwater system

The municipalities and county agencies with stormwater systems in the watershed all have completed asset inventories and management plans. This is an important first step to gaining a full understanding of system needs and the resources that will be necessary to repair or replace failing parts, replace or upgrade aging parts, and maintain the function of stable parts of the stormwater conveyance system. Each MS4 will conduct needed inspection, maintenance, clean-outs and repairs to their system as described in their permit applications/SWMPs, which will be the basis for the maintenance strategy. HRWC will report monitoring results annually to highlight target areas for potential maintenance and upgrade activities.

6. Conduct bacterial source identification and remediation

The project aims to determine the presence, absence, and sources of bacteria in impaired waters through a pair of potential monitoring techniques. By utilizing ambient water sampling and genetic analyses, the project will evaluate fecal indicator bacteria sourcing. For any positive human detections in ambient waters, HRWC will identify suspect stormwater outfalls and communicate with the relevant MS4 for follow-up IDEP screening. For any specific septic source discoveries within the stormwater system, HRWC will assist the MS4, along with the Washtenaw County Department of Environmental Health to communicate with suspected homeowners to educate them about the impact of failing septics, eliminate any sewer-to-storm connections, or remediate any failing septic systems. Investigations will be limited to stormwater systems and direct connections to them. HRWC and local partners will also execute outreach and education strategies (as part of the PEP) to property owners in the impaired creeksheds on pathogen problems as well as home and pet owner remediation actions. The goals of these strategies are to improve awareness, knowledge and action concerning proper pet waste disposal and septic system maintenance. Further, HRWC and Partners will scope a program to subsidize the high cost of septic system remediation for property owners who lack sufficient means.

7. Pet waste ordinance education

This program builds off the work of Activity 6 in educating the general public on the impacts of pet waste on surface water quality and the existing local regulations concerning pet waste. Efforts will work to increase public awareness of local pet waste ordinances, including those in the City of Ann Arbor and other municipalities that pass them, and drive behaviors to reduce pet waste entering storm drains. In addition, HRWC will work with other watershed municipalities on the development, adoption and implementation of ordinances requiring the removal and proper disposal of pet waste with fines for infractions, through the sharing of educational materials as well as the installation of informational signage and pet waste disposal stations in public areas that dog walkers frequent.

8. Continue active management of Ford Lake dam flow

The end-point for phosphorus reduction efforts in the watershed is ultimately Ford and Belleville Lakes, since they are the water bodies for which the phosphorus Total Maximum Daily Load policy is established. It is important to recognize a key activity that is engaged to control a large source of phosphorus loading within the Middle Huron River system. Ypsilanti Township operates the dam that forms the Ford Lake impoundment of the Huron River. The dam is constructed to allow the Township to normally draw water through electric turbines and release flow over the top of the dam under normal circumstances. However, when the dissolved oxygen levels in Ford Lake bottom water drop near zero, the Township can open gates at the bottom of the dam (reducing turbine flow) which causes lake water to mix and increase oxygen at the bottom. This replacement of oxygen keeps phosphorus in bottom sediment from releasing into the water column. This practice prevents phosphorus levels from exploding and prevents algae blooms in the lake. It essentially locks up an important source of phosphorus. Ypsilanti Township will continue to engage in this effort to control bottom phosphorus releases when it is feasible without completely shutting down power turbines.

III. Monitoring Plan

A summary of past monitoring results and conclusions related to TMDLs in the watershed is included in Appendix A. The summaries provided are based primarily on data collected through HRWC's Chemistry and Flow Monitoring Program, which has been funded in part by MS4s. Currently the MS4s and other watershed partners plan to continue to support this program to seasonally monitor Middle Huron River tributaries for TMDL pollutants. However, for the purposes of NPDES stormwater permit compliance, the MS4s commit to the following monitoring plan.

1. MS4s will support the collection of water quality samples from sites that are located at or near major tributary mouths. Figure 1 shows a map of long-term monitoring sites at the time of publication. A current map of monitoring sites is located at <https://www.hrwc.org/chemistryandflow/>.
2. Samples will be collected at least twice during five years not including the data included from previous monitoring. Sampling years will be in 2024 and 2027. At least one sampling event will take place at each of the nine sites. An effort will be made to sample water quality parameters during a representative (i.e. >0.25" and <1.5") wet weather event.
3. Samples will be collected following procedures identified in HRWC's Chemistry and Flow Monitoring Program QAPP (see Appendix B). Samples will be analyzed by the Ann Arbor Water Treatment Plant Laboratory or other certified lab for the following concentrations: Total Phosphorus (TP), Total Suspended Solids (TSS), and *E. coli*.
4. Stream flow estimates will be obtained from existing stations during the dates and times water quality samples are collected.
5. The pollutant concentrations and stream flow estimates will be used to update pollutant loading models and estimate pollutant load reductions. These results will be summarized in a brief report to be shared with the public via HRWC and/or MS4 websites at least once every five years, but currently is done annually.

6. Depending on the results from long-term monitoring sites, additional short-term investigative sites may be selected upstream. These sites will be sampled within an hour of sampling at the downstream site so that results can be compared and better define pollutant source locations.
7. Based on a review of sampling data and summary reports, BMP implementation will be reviewed and BMPs may be updated or revised to ensure progress toward achieving TMDL pollutant load reductions.

In addition to this stormwater sampling plan, HRWC currently collects macroinvertebrates three times a year at sites throughout the Huron River Watershed. A number of these sites (see Figure 2) are in Malletts Creek and Swift Run watersheds, which are impaired for low biota diversity. This monitoring is not required, and MS4s do not commit to continue such sampling, but HRWC plans to continue doing so on behalf of all MS4s.



Figure 1. Long-term water quality monitoring stations in the Middle Huron River watershed.

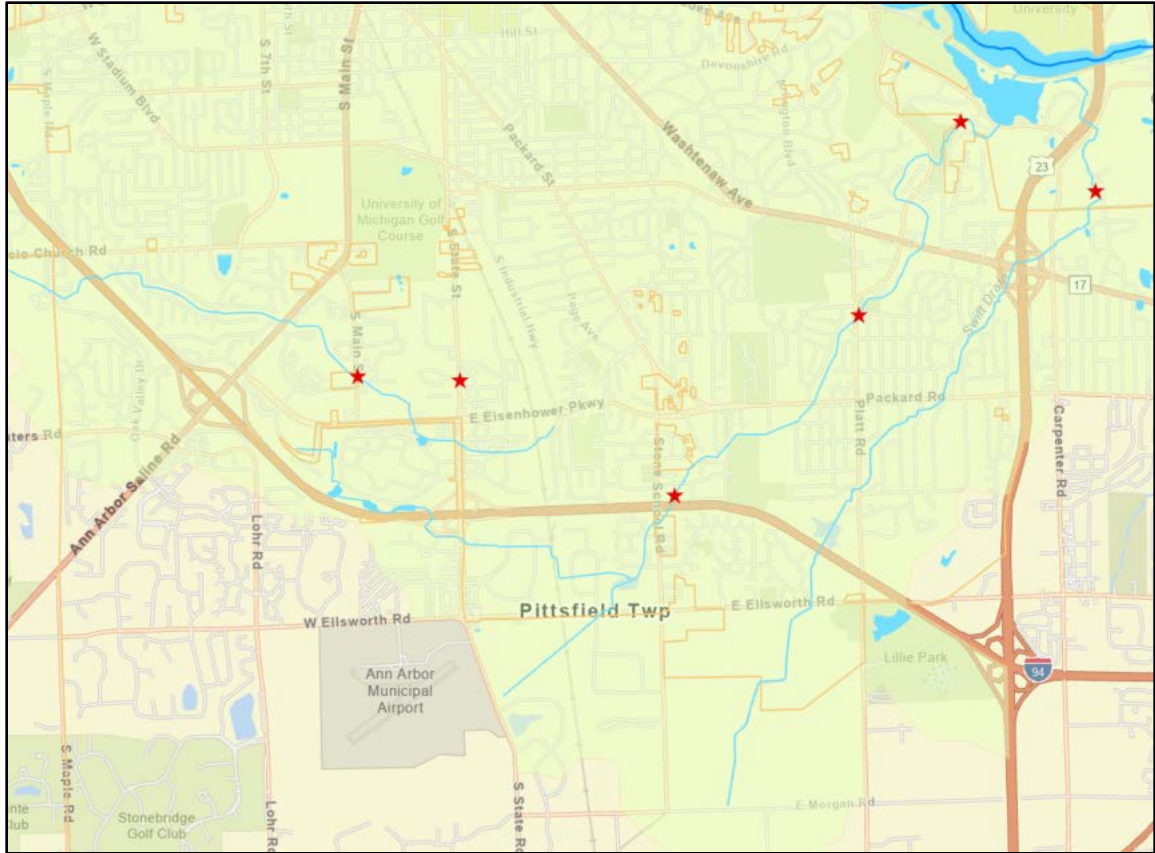


Figure 2. Current HRWC macroinvertebrate sampling locations in Malletts Creek and Swift Run watersheds.