

WAYNE COUNTY TOTAL MAXIMUM DAILY LOAD (TMDL) IMPLEMENTATION PLAN



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C/O DEPARTMENT OF PUBLIC SERVICES
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This document establishes procedures and/or outlines the programs that Wayne County will implement to meet the minimum control measures required for the Total Maximum Daily Load (TMDL) Implementation Plan under the MDEQ Municipal Separate Storm Sewer System (MS4) discharge permit. Wayne County has developed its Storm Water Management Plan (SWMP), including this TMDL Implementation Plan, in collaboration with watershed partners. These partners include the Alliance of Rouge Communities (ARC), the Alliance of Downriver Watersheds (ADW), Friends of the Rouge (FOTR), Friends of the Detroit River (FDR), and Huron River Watershed Council (HRWC). Wayne County will continue to work with partners to execute this TMDL Implementation Plan, and to develop any necessary future revisions to the SWMP and this TMDL Implementation Plan. Execution of this TMDL Implementation Plan will be coordinated by the Wayne County Department of Public (WCDPS) Water Quality Management Division (WQMD).

I. BACKGROUND

The procedures below describe how Wayne County plans to meet the TMDL elements of the MS4 permit application questions 85 – 88. These requirements are as follows:

- Provide a procedure for identifying and prioritizing best management practices (BMPs) to reduce the TMDL pollutants,
- Provide a list of BMPs that will be implemented to reduce the TMDL pollutants, and
- Provide a monitoring plan to assess the effectiveness of BMPs.

The U.S. Environmental Protection Agency has approved five TMDL Assessments within Wayne County as listed below.

- Rouge River Watershed (Biota, *E.coli*);
- Johnson Creek (Dissolved Oxygen); and
- Ecorse Creek (Biota, *E.coli*).

The biota and *E.coli* assessments apply to the entire Rouge River and Ecorse Creek watersheds, respectively, while the Johnson Creek dissolved oxygen (DO) assessment only applies to the City of Northville and Northville Township (in Wayne County) and the City of Novi (in Oakland County).

II. BMP PRIORITIZATION PROCEDURE

For the Rouge River watersheds, the Alliance of Rouge Communities, Wayne County, and other watershed partners has developed a procedure for identifying and prioritizing BMPs currently being implemented or to be implemented during the permit cycle. Attachment 1 presents the Rouge River Collaborative TMDL Implementation Plan for Municipal Stormwater Permittees that describes the procedure watershed partners used for identifying and prioritizing BMPs within the Rouge watershed (see Section C, page 5). WQMD staff also worked with the

members of the ADW to develop their Collaborative TMDL Implementation Plan including the procedure prioritizing implementation BMPs (see Attachment 2).

III. PRIORITY BMPS SELECTED

The prioritized list of BMPs, for the Rouge River Watershed, is identified in Section D, Table 7, page 5 of the Rouge River TMDL Implementation Plan (see Attachment 1). The prioritized list of BMPs, for the County's downriver watersheds, is identified in ADW TMDL Implementation Plan (see Attachment 2).

IV. EVALUATING EFFECTIVENESS

The effectiveness of the Collaborative TMDL Implementation Plan that WCDPS is a party to will be evaluated using various tracking metrics and watershed monitoring. The metrics that will be tracked for the Rouge River TMDL Plan are identified in Section E, Table 8, page 6 of the Rouge River Collaborative TMDL Plan (see Attachment 1). The watershed monitoring strategy for the Rouge watershed is also described in Section E with the parameters, locations and frequency of monitoring identified in Table 9 page 7 (see Attachment 1). The metrics and watershed monitoring plan that will implemented under the ADW TMDL Plan are identified in Section III, page 3 of the ADW's Collaborative TMDL Plan (see Attachment 2).

V. PROCESS FOR UPDATING/REVISING THIS PROCEDURE

This procedure and the BMP Implementation Plans shall be reviewed at least once during the permit cycle by the Wayne County Storm Water Program Manager for any needed updates.

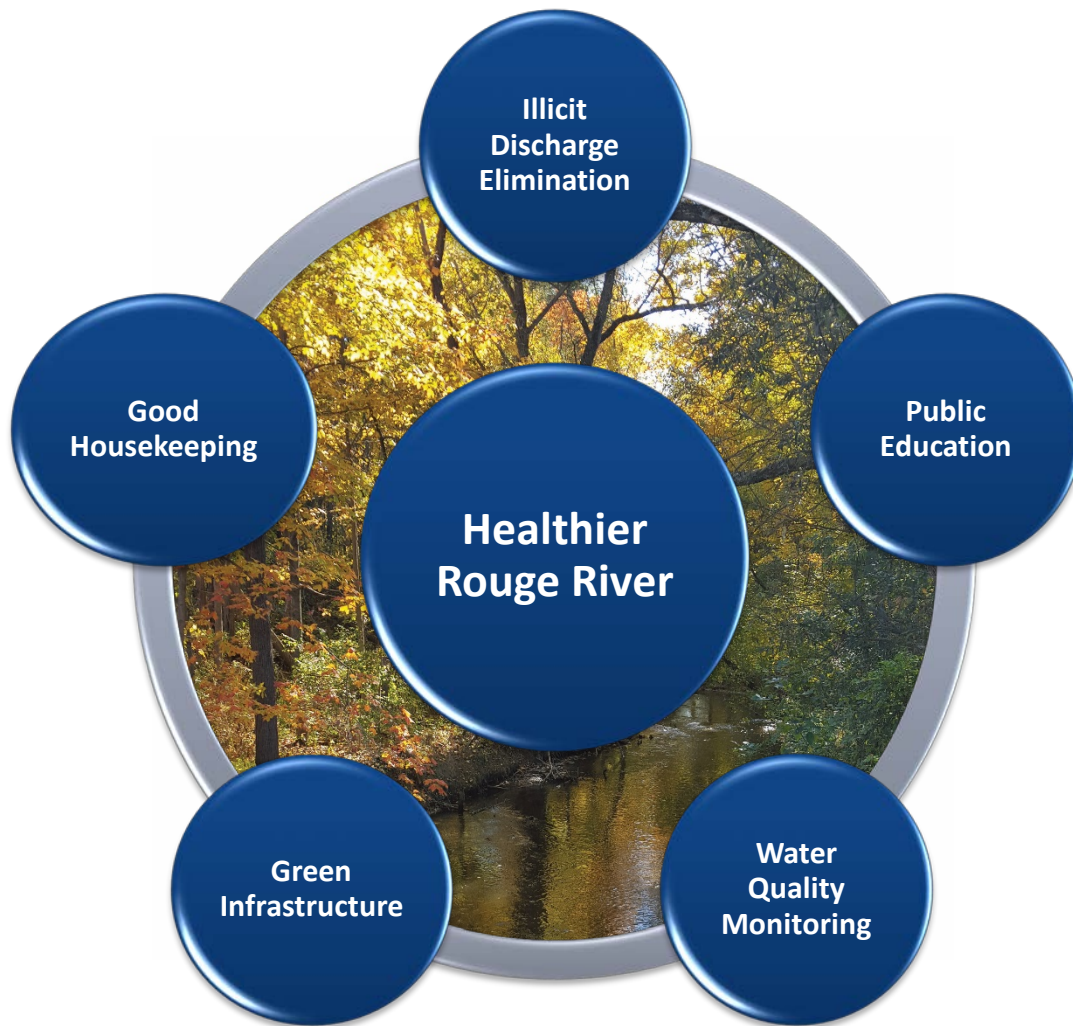
ATTACHMENTS

- | | |
|--------------|--|
| Attachment 1 | Rouge River Collaborative Total Maximum Daily Load (TMDL)
Implementation Plan for Municipal Storm Water Permittees |
| Attachment 2 | Alliance of Downriver Watersheds Total Maximum Daily Load (TMDL)
Implementation Plan for Municipal Storm Water Permittees |

ATTACHMENT 1

ROUGE RIVER COLLABORATIVE TOTAL MAXIMUM DAILY LOAD (TMDL) IMPLEMENTATION PLAN FOR MUNICIPAL STORM WATER PERMITTEES

ROUGE RIVER COLLABORATIVE TOTAL MAXIMUM DAILY LOAD (TMDL) IMPLEMENTATION PLAN FOR MUNICIPAL STORMWATER PERMITTEES



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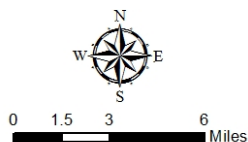
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Attachment A	List of Participating Members
Attachment B	BMP Selection Criteria and Ranking

The Alliance of Rouge Communities (ARC), a 501(c)(3) organization, is a voluntary public watershed entity currently comprised of municipal governments, counties, schools, and cooperating partners as authorized by Part 312 (Watershed Alliances) of the Michigan Natural Resources and Environmental Protection Act (MCL 324.101 to 324.90106) as amended by Act No. 517, Public Acts of 2004. The purpose of the ARC is to provide an institutional mechanism to encourage watershed-wide cooperation and mutual support to meet water quality permit requirements and to restore beneficial uses of the Rouge River to the area residents.



February 2017

This Collaborative Plan (Plan) presents the watershed-wide approach to effectively and efficiently address the pollutants contained within approved Total Maximum Daily Load (TMDL) Assessments for the Rouge River watershed. This Plan was developed by the Technical Committee of the Alliance of Rouge Communities (ARC) in response to the requirements under the State of Michigan’s Permit Application for Discharges of Storm Water to Surface Waters of the State from a Municipal Separate Storm Sewer System (MS4), revised October 2015.

This Plan is intended to meet the TMDL elements of the permit application: questions 85 – 88. These requirements are as follows:

- Provide a procedure for identifying and prioritizing BMPs to reduce the TMDL pollutants,
- Provide a list of BMPs that will be implemented to reduce the TMDL pollutants, and
- Provide a monitoring plan to assess the effectiveness of the BMPs.

The U.S. Environmental Protection Agency (EPA) requires a TMDL Assessment for waterbodies identified on the state’s impaired waters list. EPA has approved three TMDL Assessments within the Rouge River watershed as listed below. The *E. coli* and biota assessments apply to the entire watershed, while the dissolved oxygen (DO) assessment only applies to the City of Northville, Northville Township and the City of Novi.

- *Escherichia coli* (*E. coli*) (MDEQ, 2007a)
- Biota (MDEQ, 2007b)
- Dissolved Oxygen for Johnson Creek (up to 6 Mile Road) (MDEQ, 2007c)

This Plan will address each of these parameters within the limits of the MS4 permit. **As such, this should not be considered an implementation plan to address all sources, only those under the authority of the MS4 permit.**

This Plan will be implemented by the participating communities through the end of the permit cycle for the Rouge River watershed. The list of permittees participating in this Plan can be found in **Attachment A**.

B. Background

Within the TMDL Assessments, the MDEQ established primary and secondary targets for municipal stormwater permittees as shown in **Table 1**¹. When the primary target is met, the waterbody has achieved the goals of the TMDL and the waterbody would be eligible for removal from the state’s impaired waters list. The secondary target parameters can be thought of as surrogates that will be useful in determining the success of the selected best management practices that are needed to reduce pollutant loads. In all three assessments, the MDEQ opted to assign collective targets to the MS4 permittees rather than individual targets. This would seem to indicate that the MDEQ recognizes that demonstration of progress can be shown on a watershed-basis rather than within jurisdictional boundaries. It should be noted that the *E. coli* target is equivalent to the state’s full body contact standards for recreational waters which will be very difficult to achieve in urban stormwater runoff.

¹ For ease of understanding, this document refers to concentration-based, rather than load-based targets. The pollutant load targets listed in the TMDLs are based on these concentrations.

Table 1 – TMDL Targets for Municipal Stormwater Permittees

Parameter	TMDL Targets for MS4 Permittees Primary (1°) and Secondary (2°)	Notes
<i>E. coli</i>	1°: 300 cfu/100 ml and 130 cfu/100 ml	Daily geometric mean value 30 day geometric mean value
Biota	1°: Procedure 51 scores ≥ Acceptable 2°: Suspended solids ≤ 80 mg/l	For 2 successive years Annual average during wet weather
Dissolved Oxygen	1°: 7 mg/L 2°: Suspended solids ≤ 80 mg/l*	Johnson Creek is considered a cold water stream, thus has a target of 7 mg/L; all other reaches of the Rouge River have a target of 5 mg/L.

*This concentration is presumed for the purposes of this document, but it was not explicitly listed in the DO TMDL.

B.1. *E. coli* Conditions

Between May and October 2005, the MDEQ evaluated *E. coli* conditions on a routine basis during a range of weather conditions at approximately 70 locations across the watershed. Issues were found during both dry and wet weather conditions at most sites as indicated in **Table 2**. MDEQ also determined that human sources of *E. coli* were likely present at a few sites based on DNA analyses. However, only a few samples with elevated *E. coli* levels were evaluated for the presence of human DNA (MDEQ, 2007a).

Table 2 – Summary of *E. coli* Data from the *E. coli* TMDL

River Branch	Range of Exceedances by Site (% of samples above the standard)		
	Above the Monthly Standard of 130 cfu/100 ml	Above the Daily Standard of 300 cfu/100 ml	Above the Partial Body Contact Standard of 1,000 cfu/100 ml
Lower	89 – 100%*	41 – 100%	9 – 83%
Main	59 – 100%	40 – 100%	0 – 71%
Middle	89 – 100%	39 – 100%	9 – 91%
Upper	100%	90 – 100%	48 – 86%

*Table interpretation note: at least one site had 89% of samples exceed the monthly standard and at least one site had all (100%) samples exceed the monthly standard. The remaining sites fell within this range.

B.2. Suspended Solids Conditions

For the Biota TMDL, the MDEQ calculated the mean suspended solids concentration of each major river branch using data collected by the Rouge Project between 1994 and 2001 (**Table 3**). Data was considered wet weather if the sample was taken after a dry period (generally three days minimum) followed by a precipitation event (generally greater than 0.25 inches) that caused the river to respond significantly (Hufnagel 1996). In addition, an annual sediment load of 33,800 tons/year was calculated using the Simple Method model based on 33 inches of annual rainfall, 2003 land use data and event mean concentrations developed by Cave, et al for various land uses. Based on the secondary target of 80 mg/l during wet weather, a suspended solids loading target of approximately 29,000 tons/year was established. This would require a 15% reduction in sediment loads from stormwater permittees (MDEQ, 2007b).

Table 3. Suspended Solids Concentrations by River Branch

River Branch	Mean Suspended Solids Concentration (mg/l)	
	Wet Weather*	Dry Weather
Lower	191	37
Main	114	27
Middle	95	19
Upper	152	30
Watershed-wide	138	28

*The secondary TMDL target is 80 mg/l as an annual average during wet weather.

B.3. Dissolved Oxygen Conditions

For dissolved oxygen, the MDEQ determined that 3% of samples collected within the TMDL reach of Johnson Creek (a cold water stream) were below the target of 7 mg/l. This result was primarily based on 43,000 hourly DO values collected at 7 Mile Road by the Rouge Project between 1994 and 1996. The instances of low DO occurred primarily during low flow (non-runoff) conditions and high flows often resulted in higher levels of DO. Based on available data of other suspect pollutants, the MDEQ determined sediment oxygen demand was the primary factor affecting the low DO levels in Johnson Creek. They also noted that low base flow conditions were also contributing to the low DO levels. It is noted that data used in this assessment was at least 10 years old which may not reflect conditions at the time the assessment was written.

Based on modeling, the MDEQ estimated that the existing suspended sediment load from MS4s was 650 tons/year and that an 85% reduction was needed to meet the target of 96 tons/year. This should result in Johnson Creek meeting the 7 mg/l DO target for cold water streams during low flow conditions (MDEQ, 2007c). Note that the MDEQ did not explicitly state the concentration of suspended sediment needed to meet the target, only the load.

B.4. Pollutant Sources

The Alliance of Rouge Communities (ARC) determined the suspected sources and causes associated with each of the TMDL parameters as shown in Tables 4 and 5. Only those sources regulated under the MS4 permit are included in these tables.

Table 4 – Sources and Causes of *E. coli*

Suspected Sources*	Suspected Causes
Failing Septic Systems (OSDS)	• Historical lack of septic system maintenance, education, inspection and correction. • Undetected or uncorrected illicit discharges.
Illicit Sanitary Connections to a Storm System	• Undetected or uncorrected illicit discharges.
Pet Waste/Urban Animal Waste	• Little knowledge of the importance of pet waste /urban animal waste management. • Loss of pervious areas via urban development.
Re-suspended Sediment	• Excessive peak discharges • Unsatisfactory infrastructure maintenance.

*Additional sources not regulated under the MS4 permit but contributing to the pollutant are uncontrolled combined sewer overflows, sanitary sewer overflows, sanitary sewer maintenance, wastewater treatment plant flows, and runoff impacted by animal waste from agricultural lands.

Table 5 – Sources and Causes of Sediment

Suspected Sources*	Suspected Causes
Roads/Highways/Bridges and Related Infrastructure on Municipal Properties	• Loss of pervious areas via urban development. • Insufficient stormwater infrastructure maintenance.
Infrastructure on commercial & industrial properties	• Poor housekeeping. • Insufficient stormwater infrastructure maintenance.

*Additional pollutant sources not regulated under the MS4 permit but likely contributing to the pollutant are eroding streambanks, and runoff from agricultural lands and communities not regulated to discharge stormwater.

B.5. Summary

Based on the information discussed above, addressing the indicator pollutants/parameters shown in **Table 6** will make progress toward addressing the impairments identified in the TMDLs.

Table 6. Indicators to be Addressed in this Plan

Indicators	Associated TMDLs
<i>E. coli</i>	<i>E. coli</i>
Suspended Solids	Biota Dissolved Oxygen <i>E. coli</i>
Stream flow	Biota Dissolved Oxygen <i>E. coli</i>

C. BMP Prioritization Procedure

Several criteria were used to prioritize the best management practices (BMPs) that should be implemented to address the impairments. These criteria are as follows:

- A. Ability of the BMP to affect human health impacts caused by direct contact with the river.
 - Low, moderate, high
- B. Ability of the BMP to impact the concentrations of *E. coli* and suspended solids in the river and/or reduce peak stream flows.
 - Low, moderate, high
- C. Ability of the BMP to impact multiple TMDL parameters
 - Low, moderate, high
- D. Anticipated level of impact of the BMP as compared to added cost to implement it.
 - Low, moderate, high
- E. Legal authority to implement the BMP.
 - Yes or no
- F. Are there prerequisite projects that need to be completed before the BMP can be implemented?
 - Yes or no.

This process will be reviewed and updated, if necessary, by the ARC within 90 days of the end of the permit term. The review will be based on the results of monitoring data and other measurables provided in Section E.

D. Selected BMPs

Using the criteria listed above, several BMPs were evaluated for implementation as shown in Attachment B. Those BMPs with the highest scores are listed in **Table 7** along with the associated TMDL pollutant. These BMPs will be implemented by ARC members on an ongoing basis or according to the frequencies/schedules listed in the collaborative plans and stormwater management plans (SWMP).

Table 7 – Best Management Practices to be Implemented

Best Management Practice	Associated TMDL Parameter
TMDL #1: Activities listed in the Rouge River Watershed Collaborative Illicit Discharge Elimination Plan and Wayne County's SWMP	<i>E. coli</i>
TMDL #2: Review and approval of developer stormwater plans following the new Post-Construction Stormwater Standards	SS and Stream Flow
TMDL #3: Construction of stormwater management measures for permittee-owned projects on public property following the new Post-Construction Stormwater Standards	SS and Stream Flow
TMDL #4: Construction of stormwater management measures on privately owned sites following new Post-Construction Stormwater Standards	SS and Stream Flow
TMDL #5: Activities listed in the Rouge River Watershed Collaborative Public Education Plan including education on septic system maintenance, the impacts of improperly disposed of pet waste, the impacts of feeding waterfowl, and the pollution complaint line	<i>E. coli</i> and SS
TMDL #6: Conduct catch basin cleaning as listed in each permittee's SWMP	SS and <i>E. coli</i>
TMDL #7: Conduct street sweeping as listed in each permittee's SWMP	SS and <i>E. coli</i>
TMDL #8: Proper management of materials stockpiles as listed in each permittee's SWMP	SS

Note: SS=Suspended solids

E. Evaluating Effectiveness

E.1. Evaluation Metrics and Milestones

The effectiveness of this Plan will be measured using the tracking metrics indicated in **Table 8**. The milestones included below are based on each permittee's commitment in their SWMP. This information will be included in the permittees' biennial report to the MDEQ.

Table 8 – Tracking Metrics for Evaluating Effectiveness

Metric	Milestone	BMP*
A. Success of Collaborative IDEP Plan Success of Wayne County IDEP Plan	See plans	TMDL #1
B. Status of adoption of Post-Construction Stormwater Standards by Permittee	100% of permittees adopt new standards	TMDL #2, #3
C. Number of stormwater plans reviewed for private sites under new standards vs previous standards	100%	TMDL #2
D. Percentage of permittee projects constructed under new standards vs previous standards; and Percentage of private projects constructed under new standards vs previous standards	100%	TMDL #3, #4
E. Success of Collaborative PEP Plan	See plan	TMDL #5
F. Number of catch basins cleaned	100%	TMDL #6
G. Miles of streets swept	100%	TMDL #7
H. Number of stockpiles showing no impact to stormwater runoff	100%	TMDL #8

*As described in Table 7.

Effectiveness will also be determined by monitoring results as described below and outlined in **Table 9**. The dates below assume that some of the Rouge permittees will be issued their permits by the end of 2019.

Table 9. Monitoring Plan

Parameter	Anticipated Monitoring Sites	Frequency	Schedule
Dissolved oxygen	Event 1 and 2: Johnson Creek at 7 Mile east of Sheldon Road	Event 1: 5 months Event 2: 2 months	Event 1: May – Oct 2017 Event 2: May – Oct 2022, if needed
<i>E. coli</i>	Event 1: A) Communities: Terminus of initial priority areas and Priority outfalls with discharge B) Wayne County: Priority area outfalls with discharge Event 2: Communities and Wayne County: Terminus of initial priority areas and Priority outfalls that required advanced investigations (Category A and B outfalls) plus select Category C outfalls for a minimum of 100 sites	Event 1: A) 1 time B) 1 time Event 2: 1 time	Event 1: A) 2018 B) 2017-2018 Event 2: May – Oct 2022
Suspended solids	Event 1: 90 sites (Figure 1) Event 2: Sites with average wet weather TSS > 80 mg/l and with single samples > 120 mg/L from Event 1.	Event 1: 5 times Event 2: 1 time	Event 1: May – Oct 2017 Event 2: May – Oct 2022

For *E. coli*, Event 1 sampling will take place at the terminus of the initial priority areas and priority outfalls that are being screened as part of the Collaborative IDEP Plan. At these sites, one dry weather sample will be collected. The initial priority areas are identified on **Figures 1 and 2** and the priority outfalls will be determined in 2018. In addition, Event 1 sampling will take place at the Wayne County-owned outfalls in 2017 and 2018. These outfalls are in the ARC's initial priority areas. This sampling is part of the county's outfall dry-weather screening process. Approximately, 500 outfalls (400 community-owned and 150 county-owned) will be screened during this process. We estimate that 175 samples will be collected based on the assumption that 40% of the community and 10% of the county outfalls will have discharge.

For Event 2, *E. coli* sampling will take place during dry weather at the terminus of the initial priority areas and at priority outfalls that had *E. coli* concentrations > 5,000 cfu/100 mL (Category A and B outfalls per the Collaborative IDEP Plan) during Event 1. In addition, outfalls with *E. coli* between 1,000 and 5,000 cfu/100 mL (Category C outfalls per the Collaborative IDEP Plan) during Event 1 will be sampled so that a minimum of 100 locations are sampled during Event 2. The Event 1 samples will be compared to the Event 2 samples to determine the effectiveness of reducing *E. coli* levels.

DO levels in Johnson Creek were evaluated in 2017 as shown in **Figure 3**. This will be the Event 1 data. Although the data is still provisional, it is expected that the water quality standard of 7 mg/L will be met more than 90% of the time. As a result, the creek is expected to be removed from the impaired waters list in the 2020 Integrated Report. However, if the creek is not removed from the impaired waters list, Johnson Creek will be re-monitored at the same location (7 Mile and Sheldon roads) for Event 2. This monitoring will consist of continuous readings for a period of two months during the summer. This data will be compared to the 2017 results collected during the same period.

Suspended sediment levels were measured at 90 sites across the watershed in 2017 as shown in **Figure 4** for Event 1. Samples were collected on a routine basis to include both dry and wet weather conditions.

The monitoring sites were selected to catch tributaries prior to the confluence with the larger branches of the River. This was done to better identify pollutant sources. Sites were also located throughout the main branches of the Rouge to capture water quality from those stormwater outfalls discharging directly to the main branches. Effort was made to include monitoring sites in all MS4 permittee's jurisdictions that have open streams that drain to the Rouge. For Event 2, suspended sediment sampling will be repeated during wet weather at sites where the average wet weather TSS values exceeded 80 mg/l and where single sample values exceeded 120 mg/L in 2017. This sampling will occur one time during wet weather. The Event 1 and Event 2 data will be compared to the values included in **Table 3** (from the Biota TMDL Assessment) to determine if progress has been made in achieving the wet weather suspended sediment target of 80 mg/L.

Two reports will be prepared as part of this plan. First a metric summary report will be developed following the submittal of the permittees second progress report. This report will describe the progress toward meeting the milestones provided in **Table 8**. In addition, a TMDL effectiveness report will be prepared that summarizes the monitoring data outlined in **Table 9**. This report will compare the most recent data to the previously collected data to determine if the permittees are making progress toward meeting the pollutant reduction goals established in the *E. coli*, Biota and DO TMDL Assessment reports.

Schedule: Metric Summary Report: Due March 30, 2023
 TMDL Monitoring Report: Due March 30, 2023

ARC Member Responsibilities:

- ARC (as contracted by the permittees)
 - Conduct instream monitoring for DO and TSS.
 - Collect *E. coli* samples at priority outfalls and at terminus of initial priority areas as part of the Collaborative IDEP Plan by October 30, 2022.
 - Collect tracking metrics data from permittees.
 - Evaluate Metrics A and E.
 - Prepare the Metric Summary and TMDL Monitoring reports.
- Counties (WCDPS)
 - Collect *E. coli* samples at priority outfalls in years 2017 and 2018 and resample priority outfalls in 2022. Provide raw data to ARC staff by October 30, 2022.
 - Keep records of Metrics B, C, D, F, G and H as listed in **Table 8** and provide the data to ARC staff by April 30, 2022.
- Cities and Villages
 - Keep records of Metrics B, C, D, F, G and H as listed in **Table 8** and provide the data to ARC staff by April 30, 2022.
- Townships and Schools
 - Keep records of Metrics C, D, F and H as listed in **Table 8** and provide the data to ARC staff by April 30, 2022.

Figure 1 – Initial *E. coli* Priority Areas in Wayne County

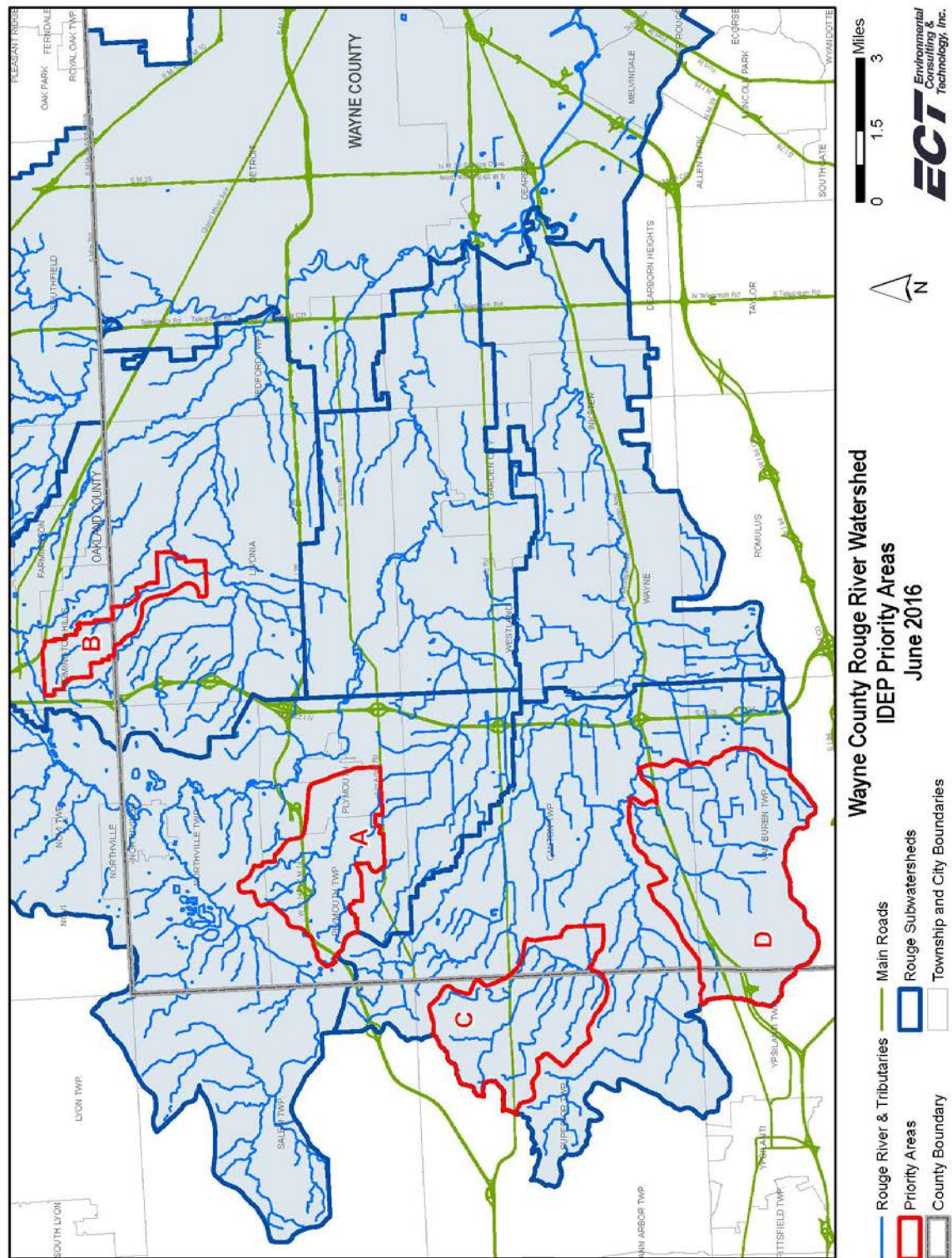


Figure 2 – Initial *E. coli* Priority Areas in Oakland County

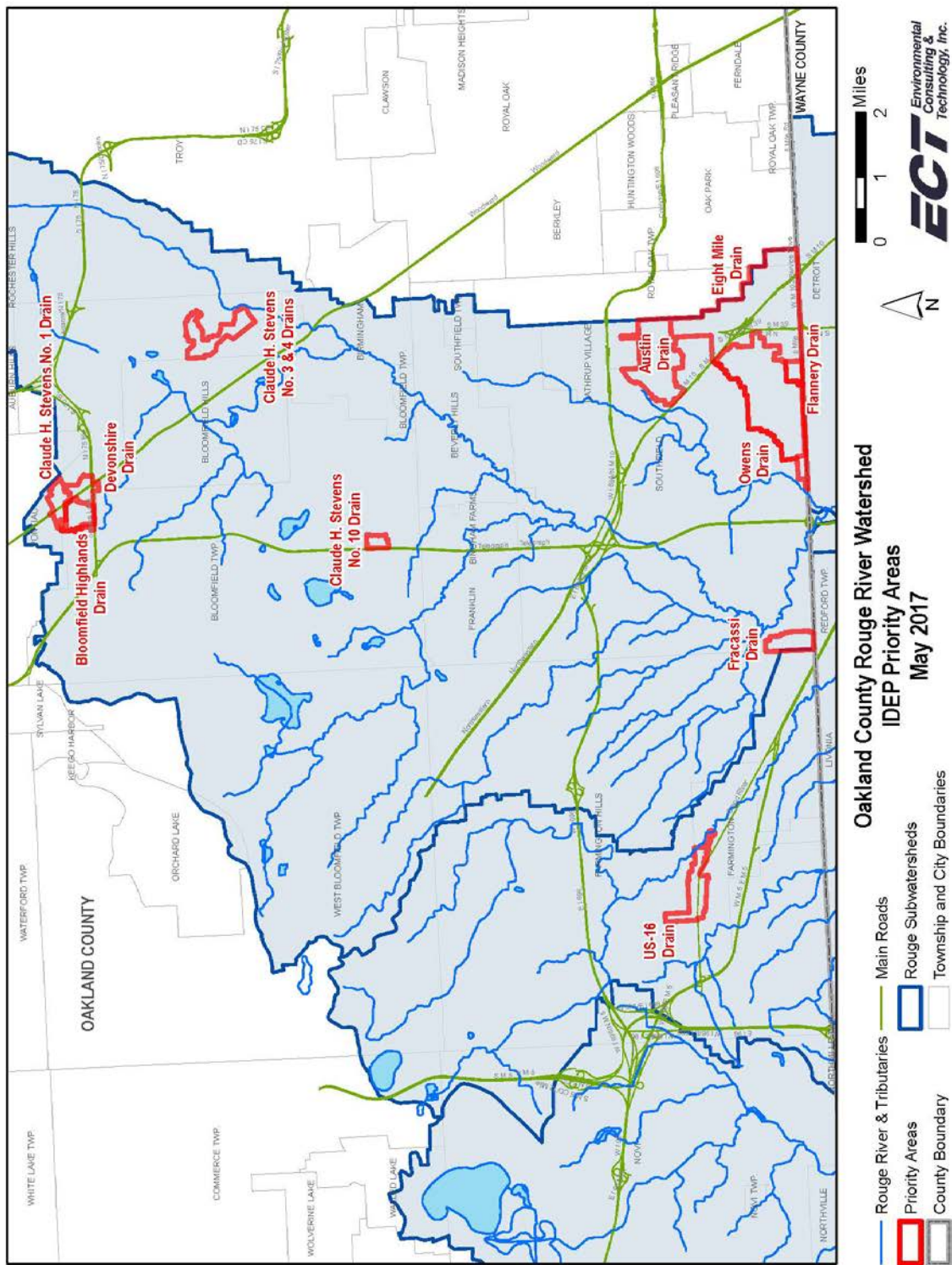


Figure 3. Dissolved Oxygen Levels for Johnson Creek at 7 Mile Road – provisional data

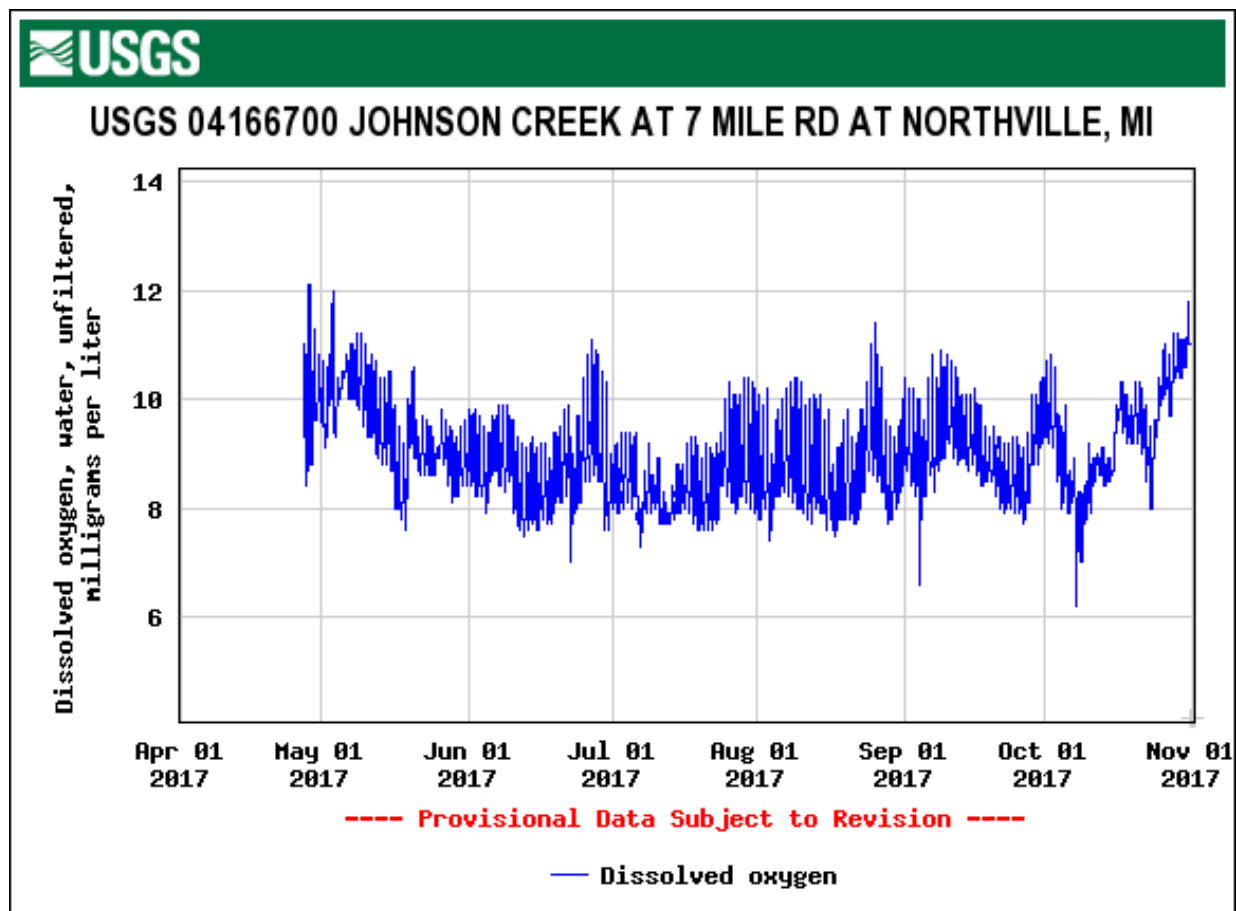
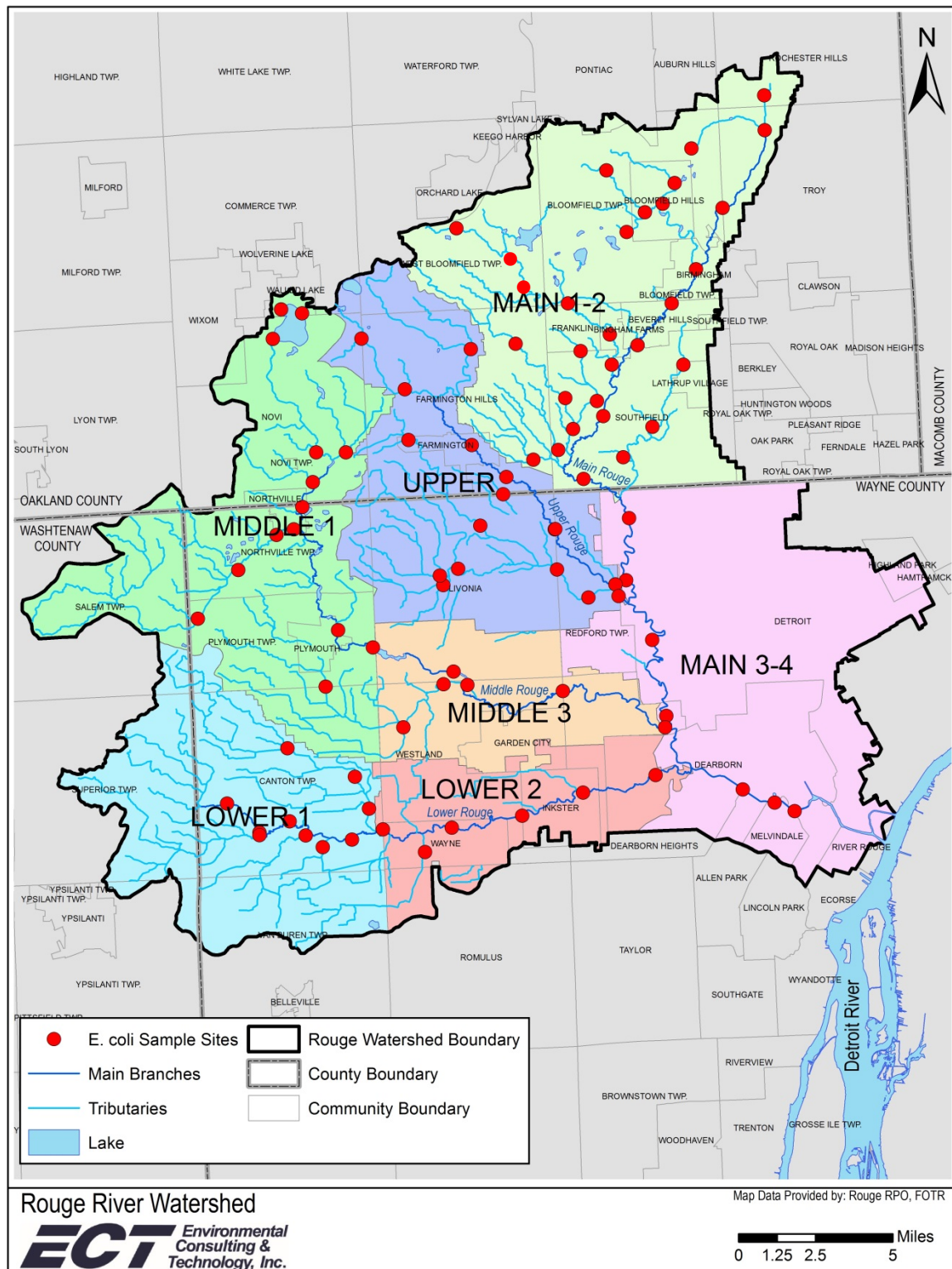


Figure 4 – 2017 (Event 1) TSS Monitoring Locations



E.2. Delisting Criteria

Certain conditions must be met in order to remove the Rouge River from Categories 4a and 5 of the impaired waters list². Conditions that may apply to the Rouge watershed and would justify delisting or recategorization of a waterbody include (MDEQ 2017, Chapter 4.13):

- The source of impairment for the initial designated use support determination was an untreated combined sewer overflow (CSO) and updated information reveals that it has been eliminated or control plan elements have been implemented but data are not yet available to document restoration (recategorized to 4b);
- Reassessment of the waterbody using updated monitoring data or information, techniques, or water quality standards, indicates that the waterbody now supports the designated use (move to Category 1 or 2), or that additional monitoring or information is needed to determine whether the designated use is supported (move to Category 3);
- Reexamination of the monitoring data or information used to make the initial designated use support determination reveals that the decision was either incorrect or inconsistent with the current assessment methodology; and
- Reassessment of a waterbody indicates that the cause of impairment is not a pollutant (recategorized to 4c).

Sampling data must be collected that are at least as rigorous as was originally used to list the waterbody. The sampling requirements and other criteria needed to delist or recategorize waterbodies for an impairment are described below.

E. coli – To be delisted, any known raw sewage discharges must be eliminated (such as untreated CSOs or sanitary sewer overflows (SSOs) and monitoring must prove attainment of water quality standards. This monitoring must be conducted a minimum of 5 weeks with a minimum of 3 samples collected at each location. A 10% exceedance threshold exists for the standards - meaning that up to 10% of the samples can exceed the standard but still meet water quality standards. Both partial and total body contact standards must be met in order for the waterbody to be removed. Additionally, weather conditions must be similar to those used in the original assessment (MDEQ 2017, Chapter 4.7.1.1).

Biota – To be delisted per the Biota TMDL, fish and macroinvertebrate communities must be reestablished so that they receive an ‘acceptable’ or ‘excellent’ rating based on a minimum of two Procedure 51 biological assessments conducted in successive years (MDEQ 2007b). However, the 2016 Integrated Report states that one bioassessment result is generally considered sufficient to make this determination (MDEQ 2017, Chapter 4.6.2.1).

Dissolved Oxygen – To be delisted, time-series samples need to be collected over a period of time that represent wet and dry weather conditions so as to capture environmental variability. As with *E. coli*, a 10% exceedance threshold is applied (MDEQ 2017, Chapter 4.5.1.1).

For any impairment, once a data set is collected that demonstrates that the river is attaining water quality standards, the final decision for delisting is made by MDEQ.

² Waterbodies in Categories 4a and 5 are impaired, but TMDL assessments are complete on 4a waterbodies while TMDL assessment are still needed on Category 5 waterbodies. Once a TMDL assessment is approved by EPA, the impairment is addressed in the next issuance of a MS4's stormwater permit.

F. References

- Alliance of Rouge Communities (ARC). *Rouge River Watershed Management Plan* June 21, 2012.
- Hufnagel, C. *1993-1994 Sampling Program Overview*. Rouge River National Wet Weather Demonstration Project Technical Memorandum RPO-SAM-TM43.
- Michigan Department of Environmental Quality. *Total Maximum Daily Load for E. coli in the Rouge River, Wayne and Oakland Counties, Michigan*. August 2007a.
- Michigan Department of Environmental Quality). *Total Maximum Daily Load for Biota in the Rouge River Watershed including Bishop and Tonquish Creeks, Washtenaw, Wayne and Oakland Counties, Michigan*. August 2007b.
- Michigan Department of Environmental Quality. *Total Maximum Daily Load for Dissolved Oxygen in Johnson Creek, Wayne and Washtenaw Counties, Michigan*. June 2007c.
- Michigan Department of Environmental Quality. *Water Quality and Pollution Control in Michigan 2016 Sections 303(d), 305(b), and 314 Integrated Report*. January 2017.

Attachment A

Participating ARC Members

Permittee (listed alphabetically)	
Communities	
Beverly Hills, Village of	Northville, City of
Bingham Farms, Village of	Northville Township
Birmingham, City of	Novi, City of
Bloomfield Hills, City of	Oak Park, City of
Bloomfield Township	Plymouth, City of
Canton Township	Plymouth Township
Dearborn Heights, City of	Redford Township
Farmington, City of	Southfield, City of
Farmington Hills, City of	Troy, City of
Franklin, Village of	Walled Lake, City of
Garden City, City of	Wayne, City of
Inkster, City of	Westland, City of
Lathrup Village, City of	West Bloomfield Township
Livonia, City of	
Melvindale, City of	
Counties	
Oakland County*	
Wayne County	
Schools	
Henry Ford College	

*Participating but this plan is not part of their pending permit application.

Attachment B

BMP Selection Criteria and Ranking

ATTACHMENT 2

TOTAL MAXIMUM DAILY LOAD (TMDL) IMPLEMENTATION PLAN FOR THE ALLIANCE OF DOWNRIVER WATERSHEDS MS4S IN WAYNE COUNTY

Total Maximum Daily Load (TMDL) Implementation Plan for the Alliance of Downriver Watersheds MS4s in Wayne County



*TMDL Plan Approved by Water Resources Division on May 31, 2019
Detroit River TMDL added on August 19, 2019*

The Michigan Department of Environmental Quality (MDEQ), 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 Alliance of Downriver Watersheds in Wayne County by MS4s** for the purpose of stormwater permit compliance through the permit cycle starting after 2016. This document addresses the permit application sections VII.86 through VII.88. It should be noted that this plan addresses only stormwater sources of impairments related to TMDLs and is not a *comprehensive* TMDL implementation plan.

I. TMDL AND MS4 COVERAGE

This TMDL Plan is submitted on behalf of the following Phase I and II MS4s within the Alliance of Downriver Watersheds, for each of the below-listed TMDLs, with their target loads included:

A. *Excessive bacteria (E. coli), and sediment in the Ecorse River*

Targets: For bacteria, May-October – 300 *E. coli* per 100 ml daily maximum and 130 *E. coli* per 100 ml as a 30-day geometric mean. November-April – 1,000 *E. coli* per 100 ml daily maximum.
For sediment, Primary – macroinvertebrate Procedure 51 score of at least -4, or a rating of "acceptable." Secondary – Annual mean wet-weather TSS concentration of 80 mg/l or less.

Allen Park	Romulus
Dearborn Heights	Southgate
Ecorse	Taylor
Inkster	Wayne County
Lincoln Park	Westland
Melvindale	Wyandotte

B. *Sediment in Brownstown Creek and Blakely Drain – Marsh Creek*

Target: Primary – macroinvertebrate Procedure 51 score of at least -4, or a rating of "acceptable."
Secondary – Annual mean wet-weather TSS concentration of 80 mg/l or less.

Gibraltar	Trenton
Riverview	Wayne County
Romulus	Woodhaven
Taylor	

C. *Sediment in Frank and Poet Drain*

Target: Primary – macroinvertebrate Procedure 51 score of at least -4, or a rating of “acceptable.”

Secondary – Annual mean wet-weather TSS concentration of 80 mg/l or less.

Gibraltar	Taylor
Riverview	Trenton
Romulus	Wayne County
Southgate	Woodhaven

D. *Habitat and Flow Alterations in Smith and Silver Creeks*

Note: These creeks are listed on the impaired waters list, but do not have a TMDL developed. While no additional stormwater management effort is required for these, the ADW partners will endeavor to meet the below targets that are used in drainages with existing TMDLs.

Target: Primary – macroinvertebrate Procedure 51 score of at least -4, or a rating of “acceptable.”

Secondary – Annual mean wet-weather TSS concentration of 80 mg/l or less.

Flat Rock	Wayne County
Gibraltar	Woodhaven
Rockwood	

E. *Excessive bacteria (E. coli) in the Detroit River*

Targets: May-October – 300 *E. coli* per 100 ml daily maximum and 130 *E. coli* per 100 ml as a 30-day geometric mean. November-April – 1,000 *E. coli* per 100 ml daily maximum.

Allen Park	Southgate
Dearborn Heights	Taylor
Ecorse	Van Buren Township
Gibraltar	Wayne County
Grosse Ile Township	Westland
Inkster	Woodhaven
Lincoln Park	Woodhaven-Brownstown School
Melvindale	District
Riverview	Wyandotte
Romulus	

II. PRIORITIZING AND IMPLEMENTATION BMPS

The MS4s in the Alliance of Downriver Watersheds 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 [monitoring report](#) for details, or in Appendix B for example).

To comply with NPDES stormwater permit requirements, the above-listed MS4s submit that the suite of Best Management Practices (BMPs) contained in the attached Priority Actions table represents each MS4's project priorities that will be implemented during the permit cycle to collectively make progress toward achieving each of the TMDL pollutant load reduction targets. Each MS4 has attached a table of BMPs that identifies the targeted TMDL pollutants (i.e. sediments, flow alterations 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 BMP 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.

III. MONITORING PLAN

A summary of past monitoring results and conclusions related to TMDLs in the watershed is included in monitoring reports found on the [ADW Initiatives page](#). The most recent published report is included in Appendix B, but updated monitoring results will be found on the webpage above. The summaries provided are based primarily on data collected through HRWC's Water Quality 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 ADW 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 the original long-term monitoring sites. An additional site was added as an investigative site in 2016 and then converted to a long-term site thereafter, bringing the total number of long-term sites to nine. The added site is located on the Huron River at the Fort Street bridge crossing. A current map of all water quality monitoring sites is located at the [Chemistry and Flow Monitoring website](#).
2. Samples will be collected at least twice during the permit cycle, not including the data included from previous monitoring. Sampling years will be in year one and year four. 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. For these wet-weather events, samples will be collected during the rising period of the flow hydrograph or within 6 hours of the peak storm flow. Currently, sampling under the ADW monitoring program occurs much more frequently than this – twice per month, April through September each year, with additional sampling at 3-4 upstream investigative sites each year. Several wet-weather events are sampled during this schedule, plus an autosampler is used to sample multiple times during wet weather events from the beginning of the storm to after peak flow. The ADW plans to continue this monitoring regime, though it commits to twice during the permit cycle.
3. Samples will be collected following procedures identified in ADW's Monitoring Program QAPP (see Appendix A). Samples will be analyzed by the Ypsilanti Community Utility Authority

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 twice during the permit cycle.
6. Depending on the results from long-term monitoring sites, additional short-term investigative sites will be selected upstream in attempt to identify potential source areas. 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. Results from this investigation will be shared with the appropriate contacts under the Illicit Discharge Elimination Program (see separate IDEP plan).
7. Any sites with sample results above the previously listed TMDL targets will be resampled to confirm and average results.
8. A plan for implementing BMPs in TMDL areas was developed and described in section II and a list of BMPs to be implemented by MS4s was included with each MS4's permit application. BMP implementation will begin within a year in these areas. If after implementation of high-priority BMPs TMDL targets continue to be exceeded or target parameter values increase in severity, MS4s will re-evaluate the plan and begin implementing additional high or medium-priority BMPs within a year after making this determination. BMPs will be selected for implementation according to the strategy described in section II.
9. Based on a review of year one and year four data and summary reports, BMP implementation will be reviewed and BMP implementation plans may be updated or revised to ensure progress toward achieving TMDL pollutant load reductions. BMPs that are employed will be evaluated using a before and after analysis of the parameter that is deemed impaired in a given TMDL. For bacteria TMDL areas, a sampling event with levels exceeding the single-sample *E. coli* standard will be compared to dry-weather sampling results (during warm-weather, productive months, or other conditions similar to original samples) after the BMP (or suite of BMPs) is deployed.

For sediment-based TMDLs, wet-weather TSS sample results from before and after BMP implementation will be compared. Ideally, multiple samples will be collected before and several years after BMPs are implemented. A before-after decrease in target parameters will be considered "progress" toward TMDL targets. If the after-implementation results are below target water quality standards, the BMPs will be considered successful at meeting the TMDL targets for the waterbody sampled and the MS4s in the contributing area (watershed). If multiple samples are collected, trend lines will be established to determine the degree of progress towards TMDL targets. Geometric means of qualified (i.e. meeting sampling condition requirements) post-implementation results will be used for *E. coli*, and simple means will be used for TSS results. Ultimately, to delist an impairment, additional sampling will be needed, which is beyond the scope of MS4 permit requirements to comply with water quality standards.

In addition to this stormwater sampling plan, ADW partners currently collect macroinvertebrates three times a year at sites throughout the Watershed (see Figure 2), which helps track progress towards the primary target of biota (sediment) TMDLs. Improvements in macroinvertebrate diversity (i.e. Procedure 51) will ultimately be necessary for delisting biota impairments. Sampling protocols for macroinvertebrates are also included in Appendix A, and results are reported along with water quality results in summary reports on the [ADW Initiatives page](#). The most recent published complete report (2013) is included in Appendix B. Figure 2 illustrates the Fall 2014 status and trends of macroinvertebrate sampling sites.

SWMP Priority Actions for Total Maximum Daily Load (TMDL) Progress

The table below lists stormwater BMPs that are targeted to improve water quality impairments listed by TMDL affected, and the SWMP section they apply to. If the BMP addresses a TMDL, high (H), medium (M) or low (L) priority is indicated, or (G) indicates general implementation.

Charter County of Wayne Wayne County Department of Public Services

Section*	SWMP Actions for (Wayne County)	Biota (Flow, sedimentation) TMDL	Bacteria (E.coli) TMDL
ERP	<i>Track instances of non-compliance as required under the permit</i>	G	G
PPP	<i>Access to the stormwater management plan</i>	G	G
PPP	<i>Alliance of Downriver Watersheds (Watershed group), and</i>	G	G
PPP	<i>Stormwater Management Program (SWMP) review.</i>	G	G
PPP	<i>Participation in Watershed Groups</i>	G	G
PEP	<i>Distribute Informational Materials</i>	H	H
PEP	<i>Watershed Community Calendar</i>	G	G
PEP	<i>Information in Community Newsletters and on Websites - Educational Content</i>	G	G
PEP	<i>Promote Water Resource Protection Workshops</i>	H	H
PEP	<i>Volunteer Stream Monitoring</i>	G	G
PEP	<i>Riparian Land Management Information</i>	H	H
PEP	<i>Displays and Outreach at Local and Regional Fairs and Community Events</i>	G	G
PEP	<i>Promote County-wide Compliant Tracking and Response System</i>	G	G
PEP	<i>Stream and River Crossing Road Signs</i>	G	G
PEP	<i>Wayne County Home Toxics Reduction Program</i>	G	G
PEP	<i>Promote Drug Take Back Programs</i>	G	G
IDEP	<i>Dry Weather Screening Program & Data Collection</i>	L	H
IDEP	<i>Illegal Dumping/Spill Response & Reporting</i>	G	G
IDEP	<i>Environmental reporting line / Tracking</i>	G	G
IDEP	<i>Time of Sale & Field Inspections</i>		H
IDEP	<i>Staff Training</i>	L	H
IDEP	<i>Dye Testing</i>	L	H
SESC	<i>Soil Erosion and Sedimentation Control (SESC) Programs</i>	H	L
SESC	<i>SESC Inspections</i>	H	L
PCSW	<i>Require PCSW controls within jurisdiction on both public and private developments</i>	H	G
P2GH	<i>Municipal Facility & Structural Stormwater Control Inventory</i>	G	G
P2GH	<i>Regulated Municipal Facility – Assessment of Potential for Pollutant Discharge</i>	G	G

SWMP Priority Actions for Total Maximum Daily Load (TMDL) Progress

Section*	SWMP Actions for (Wayne County)	Biota (Flow, sedimentation) TMDL	Bacteria (E.coli) TMDL
P2GH	<i>Catch basin cleaning</i>	H	M
P2GH	<i>Lot sweeping</i>	M	L
P2GH	<i>Litter collection</i>	G	G
P2GH	<i>Proper Handling & Disposal of Operation and Maintenance Waste</i>	M	L
P2GH	<i>Employee/Contractor Training</i>	G	G
P2GH	<i>Staff Certifications</i>	G	G
P2GH	<i>IDEP Training</i>	G	G
P2GH	<i>Management of publicly-owned, vegetated properties</i>	M	L

* Key:

ERP	Enforcement Response Procedure
PPP	Public Participation Plan
PEP	Public Education Plan
IDEP	Illicit Discharge and Elimination Plan
SESC	Construction Soil Erosion and Sediment Control
PCSW	Post-Construction Stormwater Runoff Program
P2GH	Pollution Prevention and Good Housekeeping