

**Total Maximum Daily Load Plan for *Escherichia coli* (*E. coli*)
For St Clair County Health Department & Nested Jurisdictions**

I. Introduction

A Statewide *Escherichia coli* (*E. coli*) Total Maximum Daily Load (TMDL) has been established. The plan is to be applied only to the overlap of the statewide TMDL and St. Clair County's urbanized area (UA) as defined by the most recently published census data.

The affected use is for "Partial and total body contact recreation" at these locations the impaired designated uses addressed by this TMDL are total and partial body contact recreation. The designated use rule (R 323.1100 of the Part 4 rules, WQS, promulgated under Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended) states that this water body is to be protected for total body contact recreation from May 1 to October 31 and year-round for partial body contact recreation.

The target levels for these designated uses are the ambient *E. coli* standards established in Rule 62 of the WQS as follows:

R 323.1062 Microorganisms.

Rule 62. (1) All waters of the state protected for total body contact recreation shall not contain more than 130 E. coli per 100 milliliters, as a 30-day geometric mean. Compliance shall be based on the geometric mean of all individual samples taken during 5 or more sampling events representatively spread over a 30-day period. Each sampling event shall consist of 3 or more samples taken at 2 representative locations within a defined sampling area. At no time shall the waters of the state protected for total body contact recreation contain more than a maximum of 300 E. coli per 100 milliliters. Compliance shall be based on the geometric mean of 3 or more samples taken during the same sampling event at representative locations within a defined sampling area.

Rule 62. (2) All surface waters of the state protected for partial body contact recreation shall not contain more than a maximum of 1,000 E. coli per 100 milliliters. Compliance shall be based on the geometric mean of 3 or more samples, taken during the same sampling event, at representative locations within a defined sampling area.

The target for sanitary wastewater discharges is:

Rule 62. (3) Discharges containing treated or untreated human sewage shall not contain more than 200 fecal coliform bacteria per 100 milliliters, based on the geometric mean of all of 5 or more samples taken over a 30-day period, nor more than 400 fecal coliform bacteria per 100 milliliters, based on the geometric mean of all of 3 or more samples taken during any period of discharge not to exceed 7 days. Other indicators of adequate disinfection may be utilized where approved by the department.

The targets for this TMDL are 300 *E. coli* per 100 milliliters (mL) expressed as a daily maximum load and concentration from May 1 to October 31 (i.e., daily target) and 130 *E. coli* per 100 mL as a 30-day geometric mean, expressed as a concentration (i.e., monthly target). An additional target is the partial body contact standard of 1,000 *E. coli* per 100 mL as a daily maximum concentration year-round. Achievement of the total body contact daily maximum target is expected to result in attainment of the partial body contact standard.

II. **Procedure for Identifying and prioritizing BMPs currently being implemented for the TMDL in the Urbanized Area within the jurisdictional boundary of St. Clair County**

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The level of detail in identifying and prioritizing best management practices (BMPs) to address the *E.coli* TMDL in St. Clair County varies with the extent of local involvement, stakeholders, and the level of involvement of local governing institutions. Implementation of a procedure to identify and prioritize BMPs will be as follows:

1. St. Clair County will continue its involvement with the St. Clair County NPDES MS4 Advisory Group for Stormwater Management and cooperate with those developing a collaborative plan to address the regional issue of the *E. coli* TMDL.
2. St. Clair County will also work with local stakeholder groups which are involved in the ongoing work with the Belle, Black, Northeastern and Pine River Watershed Advisory Groups to identify BMPs to implement within economically feasible implementation parameters.
3. St. Clair County will review existing Watershed Management Plans (WMPs) to determine which BMPs these plans have identified to address the *E. coli* TMDL which is evaluated in the WMPs.
4. St. Clair County will review the existing *E. coli* TMDL adopted by Michigan Department of Environment, Great Lakes, and Energy (EGLE) for recommended BMPs.
5. The above mentioned TMDL document will also be used to assist in prioritizing BMPs to address the *E. coli* TMDL on the identified sub-watersheds or sections of the Black River which are in the Urbanized Area of St. Clair County.
6. St. Clair County will cooperate with the St. Clair County NDPEs MS4 Group and other stakeholders to revise this TMDL procedure to assure it can be realistically implemented. This will be done at least once per permit cycle.
7. Once a BMP is implemented, it will be reviewed at least once a permit cycle to determine effectiveness. Or, if it is an administrative BMP if updates or revisions will be necessary.
8. Criteria for review, updates or revisions of a BMP will be completed once per permit cycle.
9. Any changes in identification of BMPs or prioritization of BMPs will be reported in a scheduled progress report during a permit cycle.

III. List of Prioritized BMPs currently being Implemented during the permit cycle to make progress towards achieving a load reduction.

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There are several best management practices (BMPs) available to reduce *E. coli* in waterways and surface waters of the state. They can generally be divided into two groups: source control and pre-storm pipe drainage reduction.

As its name implies, **source control strategies** have the goal of reducing pollution at the source. They can involve both structural and non-structural BMPs and many times, they can be more cost-effective than pre-storm drainage reduction strategies. Examples of source control strategies for *E. coli* reduction currently being implemented by St. Clair County and which they have some control over are:

Table 1. Source Control Strategies

BMPs or Strategies currently in place	Tasks	Targeted TMDL
Illicit Discharge Elimination Program (IDEP)	Outfall sampling, source tracking, dry weather screening, video/TV of drains, smoke/dye testing	<i>E. coli</i>
Runoff reduction	Use of green infrastructure to transport stormwater, e.g., bioswales, porous paving, rain gardens, infiltration basins.	<i>E. coli</i>
On Site Sewage Systems (OSSS) Program	Educational programs, inspections, information for repair and replacements as administered by the County Health Department	<i>E. coli</i>
Pet waste management	Educational programs, pet waste disposal products at county parks	<i>E. coli</i>
Storm sewer maintenance/cleaning	Catchbasin cleaning, street sweeping, roadkill pickup	<i>E. coli</i>
Low Impact Development (LID)	LID Ordinances, practices for new developments	<i>E. coli</i>
Wildlife / waterfowl management	Population control, especially geese, ducks at county/city parks with lake or river frontage.	<i>E. coli</i>

The above table is also prioritized with the order they are listed. If this priority changes when the table is reviewed during the permit cycle or before the first progress report of this permit period, then the table will be revised and an updated table with the new priority ranking will be submitted with the progress report.

The **Pre-Storm Pipe drainage reduction BMPs or Strategies** are those activities which involve the use of more structural controls to reduce bacterial loadings. This can be achieved by many methods such as intercepting a site’s stormwater runoff and using physical or biological BMPs to effect pollutant removal rates. These removal rates can vary greatly depending on the literature researched but can range from 20% up to 100%, again dependent on many natural setting variables.

Examples of current practices for pre-storm pipe drainage are:

Table 2. Pre-Storm Pipe Drainage

BMPs or Strategies currently in place	Tasks	Targeted TMDL
Dry Detention Basins	UV Light exposure, settling, infiltration	<i>E. coli</i>
Wet Detention Basins	UV Light exposure, settling, biotic predation	<i>E. coli</i>
Bioswales/bioretenion	UV Light exposure, settling, infiltration, drying	<i>E. coli</i>
Vegetated Filter strips	Filtration, infiltration	<i>E. coli</i>
Riparian buffers	Exclusion from stream, drains or rivers, filtration, infiltration	<i>E. coli</i>
Constructed wetlands	UV Light exposure, settling, infiltration, biotic predation	<i>E. coli</i>
Infiltration trenches/swales	Infiltration	<i>E. coli</i>

As other BMPs or strategies are identified and implemented; or are already being implemented, they will be added to this list and reported during a scheduled progress report submitted for the NPDES MS4 permit during the permit cycle.

IV. **Monitoring Plan for assessing BMP effectiveness towards achieving TMDL pollutant load reduction.**

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St. Clair County (SCC) and its nested jurisdictions will take the following approach to meet the TMDL goals and proposed the following plan for monitoring the effectiveness of the BMPs to reduce *E. coli* pollutant load.

St. Clair County’s jurisdiction is limited to County and nested jurisdiction owned facilities within the urbanized area. There are 122 discharge/outfall points from SCC and nested jurisdictions within the TMDL boundary. See Table 3 for a breakdown of the number of outfalls and/or point of discharges (POD) each entity has in the TMDL area.

Table 3. All outfalls/point of discharges (POD) in the current TMDL area

Member	Number of Outfalls/POD in TMDL Area
St Clair County	31
Nested Jurisdictions	
Algonac Community School District	12
East China School District	3

Member	Number of Outfalls/POD in TMDL Area
Marysville Public Schools	26
St. Clair County RESA	4
St. Clair County Community College	7
Port Huron Area School District	39

SCC MS4 *E. coli* monitoring plan will consist of end of pipe wet weather sampling and testing for approximately half of the outfalls/points of discharge within the TMDL area, 64 in total. Wet-weather sampling will be conducted as follows:

- a. Sampling will be completed between May 1st and October 31st
- b. Sampling will focus on the “first flush” within the first 30 minutes, but not longer than the first 60 minutes, after the beginning of a rain event
- c. The rain event shall generate run-off sufficient for obtaining a sample
- d. A 72-hour dry weather period prior to the sampling rain event is necessary
- e. Laboratory analysis will occur within 6 hours of collection of the sample

Any attempts to sample will be documented and the reason that the above conditions were unable to be met will be noted.

SCC and nested jurisdictions will attempt to collect monitoring grab samples from all outfall/discharge points listed in Tables 4 and 5 pre and post BMP implementation monitoring. Wet weather sampling will be performed on all outfall/point of discharge sources twice during the permit cycle, with all initial screenings being completed prior to any follow up sampling. Due to the nature of wet weather sampling, it is unlikely that all the points will be sampled during a single rain event. SCC and nested jurisdictions will implement BMPs, with *E. coli* screening occurring both pre and post BMP implementation. The *E. coli* data will be recorded and analyzed to attempt to equate characteristics of the drainage district with the *E. coli* levels recorded.

Table 4. St. Clair County outfalls/PODs for TMDL screening

Outfall/POD ID	Latitude	Longitude	Receiving Water
HUNTINGTON RAINGARDEN	42.997087	-82.50714	Baldwin Drain
WEXFORD RAINGARDEN	42.996255	-82.512308	Baldwin Drain
BUCKINGHAM RAINGARDEN	42.996123	-82.506335	Baldwin Drain
GLADYS	42.72371	-82.49659	Belle River
COTTRELL & EXT	42.71436	-82.5051	St. Clair River
GEYMAN	42.693571	-82.504543	St. Clair River
CLIPPERT	42.68182	-82.50856	St. Clair River
COLONY	42.62140	-82.58048	Lake St. Clair
CROCKER	42.62072	-82.57305	Lake St. Clair

PARKER	42.61827	-82.56065	Lake St. Clair
BV10	43.097597	-82.484501	Lake Huron
PH01	42.999913	-82.484403	Black River
KM02	42.990015	-82.537833	Black River
PH06	42.982503	-82.488417	Black River
PH07	42.981563	-82.496138	Black River
PH04	42.980265	-82.481953	Black River

Table 5. St. Clair County nested jurisdiction outfalls/PODs for TMDL screening

Outfall/POD ID	Latitude	Longitude	Receiving Water
Algonac Community School District			
ACSD-01	42.631025	-82.584224	SCCDO
ACSD-02	42.631858	-82.582224	SCCDO
ACSD-06	42.625911	-82.583732	SCCRC
ACSD-07	42.625577	-82.582293	SCCRC
ACSD-08	42.625516	-82.58226	SCCRC
ACSD-09	42.620139	-82.533159	City of Algonac
East China School District			
MCS-01	42.7138553	-82.49430652	City of Marine City
MCS-02	42.7242961	-82.49209541	City of Marine City
Marysville Public Schools			
GES-01	42.9218925	-82.47339816	City of Marysville
GES-02	42.9212963	-82.5033631	City of Marysville
GES-03	42.9210766	-82.56050795	City of Marysville
MES-01	42.9213935	-82.469976	City of Marysville
MES-02	42.921431	-82.469097	City of Marysville
MES-03	42.9209312	-82.468983	City of Marysville
MES-04	42.9204808	-82.49928239	City of Marysville
MES-05	42.9199351	-82.51439878	City of Marysville
MES-06	42.9192638	-82.47503016	City of Marysville
WES-01	42.9052126	-82.488609	City of Marysville
WES-02	42.9051724	-82.487683	City of Marysville
WES-03	42.9051913	-82.487046	City of Marysville
WES-04	42.9059607	-82.485563	City of Marysville
WES-05	42.9072525	-82.48784	City of Marysville
St. Clair County RESA			
RMC-01	42.91940211	-82.50049978	SCCRC
RMC-02	42.9184978	-82.50045246	SCCRC
St. Clair County Community College			
SC4-01	42.981648	-82.430476	City of Port Huron
SC4-02	42.981265	-82.430517	City of Port Huron
SC4-03	42.980623	-82.431267	City of Port Huron
SC4-04	42.980097	-82.430377	City of Port Huron

Outfall/POD ID	Latitude	Longitude	Receiving Water
Port Huron Area School District			
PHASD-06	42.947197	-82.456571	City of Port Huron
PHASD-07	42.946039	-82.457712	City of Port Huron
PHASD-08	43.002678	-82.450811	City of Port Huron
PHASD-09	43.000911	-82.45189	City of Port Huron
PHASD-10	43.000433	-82.450082	City of Port Huron
PHASD-27	42.97543	-82.452089	City of Port Huron
PHASD-28	42.975212	-82.452709	City of Port Huron
PHASD-29	42.97543	-82.452089	City of Port Huron
PHASD-30	42.972515	-82.447909	City of Port Huron
PHASD-31	42.972841	-82.447932	City of Port Huron
PHASD-32	43.019793	-82.443705	City of Port Huron
PHASD-33	43.020455	-82.442298	City of Port Huron
PHASD-34	42.972093	-82.447729	City of Port Huron
PHASD-35	42.971146	-82.44694	City of Port Huron
PHASD-36	42.968809	-82.43072	City of Port Huron
PHASD-37	42.969331	-82.429743	City of Port Huron
BCM-50	42.948567	-82.482832	SCCDO
BCM-51	42.949182	-82.483713	SCCDO
BCM-52A	42.949826	-82.484056	SCCDO
BCM-49	42.95	-82.484324	SCCDO

If after wet weather sampling, sites exhibit low levels of *E. coli* (less than 300 cfu/100 mL, full body contact standard), demonstrating that the drainage area/system is not a significant contributor to *E. coli* pollutant load, the point will be removed from the sample list and not revisited. If there is a higher level of *E. coli* (greater than 1,000 cfu/100 mL, partial body contact standard) found at an individual discharge than in others, the drainage area will be investigated further to attempt to determine the likely source and inform the selection and implementation of corrective BMPs.

The information gathered from the sampling and evaluation of the *E. coli* levels at the individual drainage areas will direct SCC and nested jurisdictions efforts in establishing BMPs; policy and procedures; and other stormwater control efforts to ensure progress toward achieving the required *E. coli* reductions. Those efforts will be compared with future results of the wet weather sampling prior to permit reissuance to determine which efforts have a discernable relationship to the *E. coli* levels generated.