

Bacteria Indicator Supplement
Coosa River Basin – 2009 Fecal Coliform TMDL
Action ID: GAR4_22_14_16

As part of the 2019 Water Quality Standards Triennial Review, Georgia proposed *E. coli* and enterococci criteria for waters designated as fishing, coastal fishing, and drinking water to protect recreators who may inadvertently ingest water. Enterococci is the bacterial indicator for estuarine water, while *E. coli* is the bacterial indicator for all other waters. *E. coli* and enterococci have a better correlation with gastrointestinal illness than fecal coliform, and the *E. coli* and enterococci criteria are as protective of the fecal coliform criterion. Georgia EPD adopted the primary contact criteria for the recreational months, May through October, when immersion is expected to occur, and there is a higher likelihood of water ingestion. For non-recreational months, November through April, EPD adopted secondary contact criteria based on the estimated incidental water consumption rate from the 2019 update to Chapter 3 of the EPA Exposure Factors Handbook, Ingestion of Water and Other Select Liquids. Prior to these changes, fecal coliform was the bacterial indicator for the designated uses described above.

This supplement was developed to document the translation of the fecal coliform calculations to the new bacteria indicator, either *E. coli* or enterococci, for segments listed in the existing approved Total Maximum Daily Load (TMDL) document. To the extent that the existing approved TMDL document makes specific permitting recommendations based on fecal coliform, those recommendations will be translated to the approved bacteria indicator in all permits.

The loading curve approach was used to determine the allowable summer and winter seasonal loads. For waterbodies designated as recreational waters, a single curve represents the TMDL and is the 30-day recreational geometric mean criteria for the various bacterial indicators. For waterbodies designated as fishing, coastal fishing, and drinking water, two curves represent the TMDL. One curve represents the summer TMDL for the period May through October when the 30-day geometric mean water quality criteria are equal to the primary contact recreation bacteria criteria for the various indicators, and the second curve represents the winter TMDL for the period November through April when the 30-day geometric mean criteria are higher and are equal to the secondary contact recreation bacteria criteria.

The TMDL also has a single sample maximum criterion for fecal coliform or a Statistical Threshold Value (STV) for *E. coli* and enterococci. The single sample maximum applies for the months of November through April; whereas, the STV applies year round. The STV shall not be exceeded more than 10% of the time in a 30-day period. If a single sample exceeds the maximum criterion or the STV and a geometric mean criterion was also exceeded, then the TMDL is based on the criteria exceedance requiring the largest load reduction. The difference between the critical load and the TMDL curve represented the load reduction required for the stream segment to meet the appropriate instream standard.

The TMDL calculation is given using the following equation:

$$\text{TMDL} = C_{\text{standard}} \times Q$$

Where: TMDL = Total Maximum Bacteria Load either as a 30-day
geometric mean or a single sample maximum
 C_{standard} = applicable state water quality standard
Q = stream flow

The applicable water quality standard for fecal coliform was:

- May-October 200 counts/100 mL (as a 30-day geometric mean)
- November-April 1,000 counts/100 mL (as a 30-day geometric mean)
- November-April 4,000 counts/100 mL (as a single sample maximum)

The applicable water quality standard for *E. coli* is:

- May-October 126 counts/100 mL (as a 30-day geometric mean)
- May-October 410 counts/100 mL (as a STV)
- November-April 265 counts/100 mL (as a 30-day geometric mean)
- November-April 861 counts/100 mL (as a STV)

The applicable water quality standard for enterococci is:

- May-October 35 counts/100 mL (as a 30-day geometric mean)
- May-October 130 counts/100 mL (as a STV)
- November-April 74 counts/100 mL (as a 30-day geometric mean)
- November-April 273 counts/100 mL (as a STV)

TMDLs are the sum of all wasteload allocations (WLA) plus load allocation (LA) plus a margin of safety (MOS), or, stated as an equation, $TMDL = \sum WLA + \sum LA + MOS$. The MOS can be either implicit or explicit. For bacteria TMDLs, the practice has been to allocate an explicit ten percent MOS. TMDLs have given WLAs for all point sources equivalent to the recreational 30-day geometric mean criteria. The LA has also been given as the appropriate seasonal 30-day geometric mean criteria.

The wasteload allocation (WLA) is the portion of the receiving water's loading capacity that is allocated to existing or future point sources. WLAs were provided to the point sources with municipal wastewater treatment systems and to point sources with sanitary waste streams. Industrial wastewater treatment systems may also receive a WLA if they discharge bacteria because of the type of treatment processes employed or due to commingled sanitary waste streams.

For permitted point sources identified in the original TMDL, the WLAs were calculated based on permitted or design flow and primary recreation season bacteria criteria and are expressed as an accumulated load over a 30-day period and presented in units of counts per 30 days. If a facility expands its capacity and the permitted flow increases, the WLA for the facility would increase in proportion to the flow. If there is a new facility, the WLA would be the design flow times the summertime bacteria criteria. The established WLAs will meet the applicable water quality criteria. In addition, the permits may include routine monitoring and reporting requirements.

The reasonable assurance language included in the original TMDL in Section 6.3 shall be considered superseded and replaced by the following language.

The GA EPD is responsible for administering and enforcing laws to protect the waters of the State. Reasonable assurance ensures that a TMDL's wasteload and load allocations are properly distributed to meet the applicable water quality standards. Without such distribution, a TMDL's ability to serve as an effective guidepost for water quality improvement is significantly diminished. Federal regulations implementing the CWA require that effluent limits in permits be consistent with "the assumptions and requirements of any available [WLA]" in an approved

TMDL [40 CFR 122.44(d)(1)(vii)(B)]. NPDES point source permits will be given effluent limits in the permit consistent with the individual WLAs specified in the TMDL.

The GA EPD is the lead agency for implementing the State's Nonpoint Source Management Program. Regulatory responsibilities that have a bearing on nonpoint source pollution include establishing water quality standards and use classifications, assessing and reporting water quality conditions, and regulating land use activities that may affect water quality. Georgia works with local governments, agricultural and forestry agencies, such as the Natural Resources Conservation Service, the Georgia Soil and Water Conservation Commission, and the Georgia Forestry Commission, to foster the implementation of best management practices to address nonpoint sources. In addition, public education efforts will be targeted to individual stakeholders to provide information regarding the use of best management practices to protect water quality.

Table 14a. *E. coli* WLAs Required

Facility Name	Permit No.	Receiving Stream	Listed Stream Segment	Bacteria Indicator	WLA (counts/30 days)
Adairsville North WPCP	GA0046035	Oothkalooga Cr Trib To Oostanaula River	Oothkalooga Creek U/S Bartow Co. Line to Oostanaula River	<i>E. coli</i>	4.83E+10
Adairsville South WPCP	GA0032832	Oothkalooga Cr Trib To Oostanaula River	Oothkalooga Creek U/S Bartow Co. Line to Oostanaula River	<i>E. coli</i>	5.10E+10
Calhoun WPCP	GA0030333	Oostanaula River	Oostanaula River Conasauga/Coosawattee to Oothkalooga Creek	<i>E. coli</i>	8.95E+11
Canton WPCP	GA0025674	Etowah River	Etowah River Sharp Mountain Creek to Lake Allatoona	<i>E. coli</i>	2.90E+11
Chatsworth Judson F Vick WPCP	GA0032492	Holly Cr Trib/Conasauga R Trib/Oostanaula R Trib/Coosa R	Holly Creek Downstream Chatsworth	<i>E. coli</i>	1.87E+11
Cherokee Co/ Fitzgerald Creek WPCP	GA0038555	Little River To Lake Allatoona	Little River Hwy 140 to Lake Allatoona	<i>E. coli</i>	2.70E+11
Cobb Co Noonday Creek WPCP	GA0024988	Noonday Cr Trib To Lake Allatoona	Noonday Creek Little Noonday Creek to Lake Allatoona	<i>E. coli</i>	3.94E+11
Fulton Co Little River WPCP	GA0033251	Little River	Little River Hwy 140 to Lake Allatoona	<i>E. coli</i>	1.06E+11
Goldkist Poultry Byproducts	GA0000728	Etowah River	Etowah River Sharp Mountain Creek to Lake Allatoona	<i>E. coli</i>	6.07E+10
Summerville WPCP	GA0025704	Chattooga River	Chattooga River Lyerly to Stateline	<i>E. coli</i>	1.26E+11
Trion WPCP	GA0025607	Chattooga River	Chattooga River Lyerly to Stateline	<i>E. coli</i>	5.73E+11
Woodstock WPCP	GA0026263	Rubes Creek Trib/Little R	Little River Hwy 140 to Lake Allatoona	<i>E. coli</i>	1.44E+11

Table 15a. *E. coli* Loads Required

Stream Segment ^a	Location	Bacteria Indicator	Current Load (counts/30 days)	TMDL Components					Percent Reduction
				WLA ¹ (counts/30 days)	WLASw (counts/30 days)	LA (counts/30 days)	MOS (counts/30 days)	TMDL (counts/30 days)	
Camp Creek GAR031501030209	Dry Creek to Oostanaula River (Gordon Co.)	<i>E. coli</i>	2			8.44E+11	9.39E+10	9.39E+11	Undetermined ³
Chattooga River GAR031501050603	Lyerly to Stateline (Chattooga Co.)	<i>E. coli</i>	2	6.99E+11		1.13E+15	1.27E+14	1.27E+15	Undetermined ³
Coahulla Creek GAR031501040202	Mill Creek to Conasauga River (Whitfield Co.)	<i>E. coli</i>	2		1.00E+11	3.68E+12	4.20E+11	4.20E+12	Undetermined ³
Cochran Creek GAR031501040202	Gab Creek to Amicalola Creek (Dawson Co.)	<i>E. coli</i>	2			1.68E+13	1.86E+12	1.86E+13	Undetermined ³
Conasauga River GAR031501010205	Stateline to Hwy 286 (Murray, Whitfield Co.)	<i>E. coli</i>	2			3.74E+13	4.15E+12	4.15E+13	Undetermined ³
Dozier Creek GAR031501030602	Oostanaula River Tributary (Floyd Co.)	<i>E. coli</i>	2		1.20E+10	5.02E+11	5.71E+10	5.71E+11	Undetermined ³
Drowning Bear Creek GAR031501010503	Tar Creek to Little Creek (Whitfield Co.)	<i>E. coli</i>	2		1.32E+11	1.93E+11	3.61E+10	3.61E+11	Undetermined ³
Duck Creek GAR031501050408	Headwaters to Chattooga River (Walker Co.)	<i>E. coli</i>	2			2.08E+12	2.31E+11	2.31E+12	Undetermined ³
Dykes Creek GAR031501041605	Headwaters to Etowah River (Floyd Co.)	<i>E. coli</i>	2			1.08E+12	1.20E+11	1.20E+12	Undetermined ³
Etowah River GAR031501040601	Sharp Mountain Creek to Lake Allatoona (Cherokee Co.)	<i>E. coli</i>	2	3.50E+11	1.58E+14	1.64E+16	1.85E+15	1.85E+16	Undetermined ³
Heath Creek GAR031501030402	Downstream Rocky Mountain Project (Floyd Co.)	<i>E. coli</i>	2			2.73E+11	3.03E+10	3.03E+11	Undetermined ³
Holly Creek GAR031501040203	Headwaters to Amicalola Creek (Dawson Co.)	<i>E. coli</i>	2			7.37E+11	8.19E+10	8.19E+11	Undetermined ³
Holly Creek GAR031501010402	Downstream Chatsworth (Murray Co.)	<i>E. coli</i>	2	1.87E+11		2.75E+12	3.26E+11	3.26E+12	Undetermined ³
Horseleg Creek GAR031501050211	Rome (Floyd Co.)	<i>E. coli</i>	2		2.80E+11	7.37E+11	1.13E+11	1.13E+12	Undetermined ³
Jacks River GAR031501010114	Rough Creek to Stateline (Fannin and Murray Co.)	<i>E. coli</i>	2			5.14E+12	5.71E+11	5.71E+12	Undetermined ³
Johns Creek GAR031501030301	Oostanaula River Tributary (Floyd Co.)	<i>E. coli</i>	2			6.80E+11	7.56E+10	7.56E+11	Undetermined ³
Kings Creek GAR031501050212	Coosa River Tributary (Floyd Co.)	<i>E. coli</i>	2			1.85E+11	2.06E+10	2.06E+11	Undetermined ³

Stream Segment ^a	Location	Bacteria Indicator	Current Load (counts/30 days)	TMDL Components					Percent Reduction
				WLA ¹ (counts/30 days)	WLASw (counts/30 days)	LA (counts/30 days)	MOS (counts/30 days)	TMDL (counts/30 days)	
Little Amicalola Creek GAR031501040204	Headwaters to Amicalola Creek (Dawson Co.)	<i>E. coli</i>	²			2.77E+12	3.07E+11	3.07E+12	Undetermined ³
Little River GAR031501040802	Hwy 140 to Lake Allatoona (Fulton and Cherokee Co.)	<i>E. coli</i>	²	5.19E+11	4.49E+14	2.38E+15	3.14E+14	3.14E+15	Undetermined ³
Mill Creek GAR031501010209	Crandall Ellijay Rd (C.R. 27) to Conasauga River (Murray Co.)	<i>E. coli</i>	²			2.31E+12	2.56E+11	2.56E+12	Undetermined ³
Noonday Creek GAR031501040819, GAR031501040820	Little Noonday Creek to Lake Allatoona (Cobb and Cherokee Co.)	<i>E. coli</i>	²	3.94E+11	3.99E+12	3.28E+12	8.51E+11	8.51E+12	Undetermined ³
Oostanaula River GAR031501030205	Conasauga/Coosawattee to Oothkalooga Creek (Gordon Co.)	<i>E. coli</i>	²	8.95E+11	7.06E+11	2.04E+14	2.29E+13	2.29E+14	Undetermined ³
Oothkalooga Creek GAR031501030111	U/S Bartow Co. Line to Oostanaula River (Bartow and Gordon Co.)	<i>E. coli</i>	²	9.95E+10		6.19E+12	6.99E+11	6.99E+12	Undetermined ³
Pettit Creek GAR031501041308	Satterfield Branch to Nancy Creek (Bartow Co.)	<i>E. coli</i>	²			1.16E+13	1.29E+12	1.29E+13	Undetermined ³
Polecat Creek GAR031501010504	Headwaters to Conasauga River (Murray and Gordon Co.)	<i>E. coli</i>	²			9.39E+11	1.04E+11	1.04E+12	Undetermined ³
Salacoa Creek GAR031501020603	Pine Log Creek to Coosawattee River (Gordon Co.)	<i>E. coli</i>	²			1.75E+13	1.94E+12	1.94E+13	Undetermined ³
Snake Creek GAR031501030206	Headwaters to Oostanaula River (Gordon and Walker Co.)	<i>E. coli</i>	²			6.68E+11	7.37E+10	7.37E+11	Undetermined ³
Swamp Creek GAR031501010506	Little Swamp Creek to Conasauga River (Whitfield Co.)	<i>E. coli</i>	²		1.20E+11	2.19E+12	2.56E+11	2.56E+12	Undetermined ³
Toms Creek GAR031501041607	Headwaters to Etowah River (Bartow Co.)	<i>E. coli</i>	²			3.95E+11	4.39E+10	4.39E+11	Undetermined ³

- (1) The assigned bacteria load from the NPDES permitted facility for WLA was determined as the product of the *E. coli* permit limit and the facility average monthly discharge at the time of the critical load.
- (2) Samples were not analyzed for *E. coli*, therefore critical load calculation not possible
- (3) Percent reduction could not be determined due to absence of current load calculation
- (a) Stream segments identified in Table 15a with multiple ID numbers (GAR###) represent segments that have been split into smaller subsections in the biennial 305(b)/303(d) list of waters since the original issuance of the approved TMDL.