TOTAL MAXIMUM DAILY LOADs (TMDLs)

For

Fecal Coliform

In

303(d) Listed Streams in The Ocmulgee River Basin

Cobbs Creek - (Headwaters to Shoal Creek)
Conley Creek - (Headwaters to South River)
Doless Creek - (Headwaters to Doolittle Creek)
Doolittle Creek - (Headwaters to South River)
Honey Creek - (Headwaters to South River)
Intrenchment Creek - (Headwaters to South River)
McClain Branch - (Headwaters to Honey Creek)
North Branch South River - (Atlanta)
Shoal Creek - (Headwaters to South River)
Snapfinger Creek - (Dekalb County)
Sugar Creek - (U/s Memorial Drive to South River)

Submitted to:

U.S. Environmental Protection Agency, Region 4

Prepared by:

Georgia Department of Natural Resources
Environmental Protection Division
Atlanta, Georgia

January, 2002

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LIST OF ABBREVIATIONS

BMP	Best Management Practices
CFS	Cubic Feet per Second
DEM	Digital Elevation Model
DMR	Discharge Monitoring Report
DNR	Department of Natural Resources
DWPC	Division of Water Pollution Control
EPA	Environmental Protection Agency
EPD	Environmental Protection Division (State of Georgia)
GIS	Geographic Information System
HSPF	Hydrological Simulation Program - FORTRAN
HUC	Hydrologic Unit Code
LA	Load Allocation
MGD	Million Gallons per Day
MOS	Margin of Safety
MPN	Most Probable Number
MRLC	Multi-Resolution Land Characteristic
NPDES	National Pollutant Discharge Elimination System
NPSM	Nonpoint Source Model
NRCS	Natural Resources Conservation Service
Rf3	Reach File 3*
RM	River Mile
STORET	STORage RETrieval database
TMDL	Total Maximum Daily Load
USGS	United States Geological Survey
WCS	Watershed Characterization System
WLA	Waste Load Allocation

*Reach File 3 = electronic file providing a detailed stream network from small to large streams and supports development of stream routing for modeling purposes.

SUMMARY
Total Maximum Daily Loads (TMDLs)
303(d) Listed Streams in Ocmulgee River Basin - HUC 03070103, HUC 03070104, and HUC 03070105

State: Georgia

Counties: Gwinnett, DeKalb, Walton, Fulton, Clayton, Rockdale, Newton, Henry, Spalding, Butts, Jasper, Lamar, Upson, Monroe, Jones, Crawford, Bibb, Peach, Twiggs, Macon, Houston, Bleckley, Pulaski, Dodge, Dooly, Laurens, Wilcox, Wheeler, Telfair, Ben Hill, Coffee, and Jeff Davis.

Major River Basin: Ocmulgee River

Constituent(s) of Concern: Fecal Coliform Bacteria

Summary of 303(d) Listed Waterbody Information and Allocation by Stream Segment

Stream Name	Segment Description	Hydrologic Unit(s)	Use Classification	Segment Length (miles)	Drainage Area ($miles^2$)	WLA (#/30 days)	LA (#/30 days)	MOS	TMDL (#/30 days)	Percent Reduction
Alcovy River	Cedar Creek to Bay Creek	030701030704	Fishing/ Drinking Water	4	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Alligator Creek	Batson Creek to Lime Sink Creek	030701050302 030701050301	Fishing	12	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Almand Branch	Tanyard Branch to Snapping Shoals	030701030304	Fishing	5	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Bay Creek	Headwaters to Beaver Creek	030701040202	Fishing	9	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Beaver Ruin Creek	Gwinnett County	030701030401	Fishing	8	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Big Cotton Indian Creek	Panther Creek to Brush Creek	030701030202	Fishing	5	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Big Flat Creek	Headwaters to Flat Creek	030701030706	Fishing	13	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Big Haynes Creek	Brushy Creek to Little Panther Creek	030701030505	Drinking Water	2	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD

Stream Name	Segment Description	Hydrologic Unit(s)	Use Classification	Segment Length (miles)	Drainage Area (miles^2)	WLA (#/30 days)	LA (#/30 days)	MOS	TMDL (#/30 days)	Percent Reduction
Big Haynes Creek	Headwaters to Brushy Creek	030704030503 030701030505	Fishing/ Drinking Water	9	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Big Haynes Creek	Little Haynes Creek to Yellow River	030701030504	Drinking Water	5	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Big Indian Creek	Mossy Creek to Ocmulgee River	030701040207	Fishing	7	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Big Sandy Creek	Aboothlacoosta Creek to Ocmulgee River	030701031005	Fishing	10	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Bromolow Creek	Headwaters to Beaver Ruin Creek	030701030401	Fishing	5	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Cabin Creek	Headwaters Griffin to Towaliga River	030701031104	Fishing	16	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Camp Creek	Headwaters to Jackson Creek	030701030403	Fishing	6	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Cedar Creek	Headwaters to Alcovy River	030701030704	Fishing	4	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Cobbs Creek	Headwaters to Shoal Creek	030701030103	Fishing	7	9.66	0.0	2.96E+12	Implicit + 10% Explicit	2.96E+12	93.0
Conley Creek	Headwaters to South River	030701030103	Fishing	9	14.9	0.0	4.88E+12	Implicit + 10% Explicit	4.88E+12	66.6
Doless Creek	Headwaters to Doolittle Creek	030701030102	Fishing	2	1.60	0.0	8.52E+10	Implicit + 10% Explicit	8.52E+10	94.6
Doolittle Creek	Headwaters to South River	030701030102	Fishing	5	5.56	0.0	1.15E+12	Implicit + 10% Explicit	1.15E+12	89.8
Falling Creek	Little Falling Creek to Ocmulgee River	030701031305	Fishing	9	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Honey Creek	Headwaters to South River	030701030106	Fishing	13	28.23	5.01E+10	2.44E+11	Implicit + 10% Explicit	2.94E+11	76.1
Hopkins Creek	Headwaters to Alcovy River	030701030701	Fishing	4	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
House Creek	Ball Creek to Little House Creek	030701040603	Fishing	8	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Intrenchment Creek	Headwaters to South River	030701030102	Fishing	6	11.54	2.40E+12	2.00E+12	Implicit + 10% Explicit	4.40E+12	99.9
Jacks Creek	Headwaters to Yellow River	030701030406	Fishing	4	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Jackson Creek	Gwinnett County	030701030403	Fishing	7	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD

Stream Name	Segment Description	Hydrologic Unit(s)	Use Classification	Segment Length (miles)	Drainage Area (miles^2)	WLA (#/30 days)	LA (#/30 days)	MOS	TMDL (#/30 days)	Percent Reduction
Little Haynes Creek	Hwy 20 to Big Haynes Creek	030701030504	Fishing	11	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Little Stone Mountain Creek	Headwaters to Stone Mountain Lake	030701030407	Fishing	3	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Little Suwanee Creek	Tributary to Yellow River	030701030404	Fishing	2	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
McClain Branch	Headwaters to Honey Creek	030701030106	Fishing	2	4.39	5.01E+10	2.95E+11	Implicit + 10% Explicit	3.45E+11	90.6
No Business Creek	Headwaters to Norris Lake	030701030501	Fishing	6	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	
North Branch South River	Atlanta	030701030101	Fishing	3	5.96	1.51E+11	2.85E+11	Implicit + 10% Explicit	4.36E+11	99.6
Ocmulgee River	Beaverdam Creek to Walnut Creek	030701031602	Fishing/ Drinking Water	10	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Ocmulgee River	Sandy Run Creek to Big Indian Creek	030701040107	Fishing	23	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Ocmulgee River	Tobesofkee Creek to Echeconnee Creek	030701031605	Fishing	7	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Pew Creek	Gwinnett County	030701030405	Fishing	4	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Rocky Creek	1 mile u/s Rocky Creek Road to Tobesofkee Creek	030701031406	Fishing	5	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Shetley Creek	Headwaters to Bromolow Creek	030701030401	Fishing	2	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Shoal Creek	Headwaters to Alcovy River	030701030701	Fishing	5	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Shoal Creek	Headwaters to South River	030701030103	Fishing	7	9.75	0.0	1.29E+12	Implicit + 10% Explicit	1.29E+12	97.0
Snapfinger Creek	Dekalb County	030701030104	Fishing	18	38.66	0.0	7.59E+11	Implicit + 10% Explicit	7.59E+11	81.4
Snapping Shoals Creek	Almand Branch to South River	030701030304	Fishing	10	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
South River	Atlanta to Flakes Mill Road	030701030101 030701030102 030701030103	Fishing	16	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
South River	Flakes Mill Road to Pole Bridge Creek	030701030103 030701030105	Fishing	9	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD

Stream Name	Segment Description	Hydrologic Unit(s)	Use Classification	Segment Length (miles)	Drainage Area (miles^2)	WLA (#/30 days)	LA (#/30 days)	MOS	TMDL (#/30 days)	Percent Reduction
South River	Hwy 20 to Snapping Shoals Creek	030701030301	Fishing	11	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
South River	Pole Bridge Creek to Hwy 20	030701030105 030701030107	Fishing	15	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
South River	Snapping Shoals to Jackson Lake	030701030305	Fishing	7	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Stone Mountain Creek	Headwaters to Stone Mountain Lake	030701030407	Fishing	4	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Sugar Creek	U/s Memorial Drive to South River	030701030102	Fishing	6	9.19	0.0	1.68E+12	Implicit + 10% Explicit	1.68E+12	93.4
Sweetwater Creek	Lee Daniel Creek to Yellow River	030701030403 030701030402	Fishing	6	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Swift Creek	Headwaters to Yellow River	030701030501	Fishing	5	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Tobesofkee Creek	Cole Creek to Todd Creek	030701031402 030701031401	Fishing	8	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Tobesofkee Creek	Lake Tobesofkee to Rocky Creek	030701031406	Fishing	10	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Town Branch	Downstream Jackson South WPCP to Aboothlacoosta Creek	030701031004	Fishing	3	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Turkey Creek	Headwaters to Yellow River	030701030406	Fishing	4	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Turnpike Creek	Hwy 280 to Sugar Creek	030701050403 030701050402	Fishing	24	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Tussahaw Creek	Wolf Creek to Lake Jackson	030701030903 030701030902	Fishing	6	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Walnut Creek	Headwaters to Ocmulgee River	030701031604 030701031603	Fishing	20	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Watson Creek	Headwaters to Yellow River	030701030406	Fishing	3	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Wise Creek	Headwaters to Ocmulgee River	030701031003	Fishing	6	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Yellow River	Big Haynes Creek to Jackson Lake	030701030603 030701030601	Fishing/ Drinking Water	25	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Yellow River	Hwy 124 to Big Haynes Creek	030701030501 030701030502	Drinking Water	16	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD

Stream Name	Segment Description	Hydrologic Unit(s)	Use Classification	Segment Length (miles)	Drainage Area (miles^2)	WLA (#/30 days)	LA (#/30 days)	MOS	TMDL (#/30 days)	Percent Reduction
Yellow River	Sweetwater Creek to Hwy 124	030701030406	Fishing	16	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Yellow Water Creek	1 mile d/s Stark Road	030701031001	Fishing	7	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD
Lake Jackson	Newton, Butts, and Jasper Counties	030701030903 030701030305 030701030804	Recreation	N/A*	TBD	TBD	TBD	Implicit + 10% Explicit	TBD	TBD

*Affected area equals 650 acres

TBD = To Be Determined by EPA

Note: Current and future discharges shall be permitted at or below the water quality standard for fecal coliform bacteria of 200-counts/100 ml.

Applicable Water Quality Standard for Drinking Water and Fishing use classifications:

Section 391-3-6-.03 (6) of the *State of Georgia Rules and Regulations for Water Quality Control, Chapter 391-3-6 Revised, July, 2000:*

May through October - fecal coliform is not to exceed a geometric mean of 200 per 100 ml based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. Should water quality and sanitary studies show fecal coliform levels from non-human sources exceed 200 per 100 ml (geometric mean) occasionally, then the allowable geometric mean fecal coliform shall not exceed 300 per 100 ml in lakes and reservoirs and 500 per 100 ml in free flowing freshwater streams.

November through April - fecal coliform is not to exceed a geometric mean of 1,000 per 100 ml based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours and not to exceed a maximum of 4,000 per 100 ml for any sample. The geometric mean standard is the target value for the TMDLs

Applicable Water Quality Standard for Recreation use classification:

Section 391-3-6-.03 (6) of the *State of Georgia Rules and Regulations for Water Quality Control, Chapter 391-3-6 Revised, July, 2000:*

Fecal coliform is not to exceed a geometric mean of 100 per 100 ml for coastal waters or 200 per 100 ml for all other recreational waters, based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. Should water quality and sanitary studies show fecal coliform levels from non-human sources exceed 200 per 100 ml (geometric mean) occasionally, then the allowable geometric mean fecal coliform shall not exceed 300 per 100 ml in lakes and reservoirs and 500 per 100 ml in free flowing freshwater streams.

TMDL Development - Analysis/Modeling:

The Hydrologic Simulation Program Fortran (HSPF) watershed model was used to develop these TMDLs. An hourly time step was used to simulate hydrologic and water quality conditions with results expressed as daily averages. A simulation period of 6 years was used to assess the water quality standards for these TMDLs representing a range of hydrologic and meteorological conditions.

FECAL COLIFORM TOTAL MAXIMUM DAILY LOADS (TMDLs) for 303(d) listed stream segments in the OCMULGEE RIVER BASIN

1.0 INTRODUCTION

Section 303(d) of the Clean Water Act requires each state to list those waters within its boundaries for which technology based effluent limitations are not stringent enough to protect any water quality standard applicable to such waters. The TMDL process establishes the allowable loadings of pollutants or other quantifiable parameters for a waterbody based on the relationship between pollution sources and in-stream water quality conditions. This allows water quality based controls to be developed and implemented in an effort to reduce pollution, and restore and maintain compliance with water quality standards.

2.0 WATERSHED DESCRIPTION

The Upper Ocmulgee River Basin is located in Central Georgia (Figure 1), originating in the eastern edges of the City of Atlanta. The Upper Ocmulgee Basin is made up of the South River, Yellow River and Alcovy River subwatersheds. These converge at Lake Jackson to form the Ocmulgee River (Figure 2). The Ocmulgee River flows south and southeast, runs through the northeast side of the City of Macon, and then travels approximately 120 miles until it finally joins the Oconee River near the City of Hazlehurst, to form the Altamaha River. The Altamaha River then continues in a southeastern direction to the Atlantic Ocean. The Ocmulgee River basin includes three United States Geologic Survey (USGS) eight-digit hydrologic units, HUC 03070103 (Upper Ocmulgee River watershed), HUC 03070104 (Lower Ocmulgee River watershed), and HUC 03070105 (Little Ocmulgee River watershed).

The Ocmulgee River basin falls within the Level III Piedmont and Southeastern Plains ecoregions. The Upper Ocmulgee River watershed is located in the Level IV Southern Outer Piedmont subecoregion. The Lower and Little Ocmulgee River watersheds are multifaceted watersheds, with portions of the watersheds located in the Level IV Southern Outer Piedmont, the Sand Hills, the Coastal Plain Red Uplands and the Atlantic Southern Loam Plains. There is also a corridor, running the length of the river and extending (approximately) one half to two miles inland on each side of the river, which lies in the Southeastern Floodplains and Low Terraces subecoregion. Typical characteristics for these subecoregions are as follows:

- Southern Outer Piedmont - this region contains mostly rolling to hilly terrain; mostly red clayey soils; southern most boundary occurs at the fall line; major forest type is loblolly short-leafed pine.
- Sand Hills – rolling to hilly, highly dissected coastal plain belt; generally low nutrient sand and clay soils.
- Coastal Plain Red Uplands - this region contains mostly well drained soils composed of red sand and clay; the majority of the land is utilized as cropland or pasture.

- Atlantic Southern Loam Plains - this region contains soils ranging from poorly drained to excessively drained; longleaf pine, oak and some distinctive evergreen shrubs are common vegetation.

- Southeastern Floodplains and Low Terraces – this region contains large sluggish rivers and backwaters with ponds, swamps and oxbow lakes; terraces are typically covered by oak forests, while forests of bald cypress and water tupelo grow in the swamps and river areas.

The Ocmulgee River basin contains approximately 9,349 miles of Reach File 3 (Rf3) level streams and drains a total area of approximately 6,102 square miles. Watershed land use distribution is based on the Multi-Resolution Land Characteristic (MRLC) databases derived from Landsat Thematic Mapper digital images from the period 1990-1994. MRLC land use in the Ocmulgee River basin is summarized in Table 1. Figure 3 shows MRLC land use for the South River watershed, which contains all of the 303(d) listed segments for which a TMDL has been developed in this report. Land use data in some portions of the Upper Ocmulgee watershed in proximity to the metropolitan Atlanta area was modified using a methodology developed by Aqua Terra, Inc. consultants. This methodology reclassified MRLC land use data for some forested areas from "forested" to "built up" based on an analysis of the degree or level of development adjacent to that particular area. This approach was demonstrated to produce a more accurate land use analysis when compared to data available for a limited number of areas where land use data was available that had been collected and compiled using more detailed and accurate methods than were used in developing the MRLC data. This adjustment was justifiable only for rapidly developing areas around metropolitan Atlanta where there was believed to be a large amount of (tree) canopied development occurring.

3.0 PROBLEM DEFINITION

EPA Region 4 approved Georgia's final 2000 303(d) list on August 28, 2000. This 303(d) list was then updated for the Altamaha, Ocmulgee, and Oconee River Basins and was finalized and approved by EPA Region 4 in June, 2001. The list identified the waterbodies for the Ocmulgee River basin shown in Table 2, as either not supporting or partially supporting designated use classifications, due to exceedence of water quality standards for fecal coliform bacteria. Fecal coliform bacteria are used as an indicator of the potential presence of pathogens in a stream. The objective of this study is to develop fecal coliform TMDLs for 303(d) listed waterbodies in the Ocmulgee River basin.

4.0 TARGET IDENTIFICATION

With one exception (Lake Jackson), all of the 303(d) listed waterbodies in the Ocmulgee River basin for which a fecal coliform TMDL is being developed has a designated use classification of either drinking water or fishing. The fecal coliform water quality criteria for protection of the drinking water and fishing use classification is established by the *State of Georgia Rules and Regulations for Water Quality Control, Chapter 391-3-6 Revised, July, 2000*, and will be used as the target level for fecal coliform TMDL development for all listed segments in the Ocmulgee River basin, with the exception of Lake Jackson.

Section 391-3-6-.03 (6) of the *State of Georgia Rules and Regulations for Water Quality Control, Chapter 391-3-6 Revised, July, 2000,* states that during the months of May through October, when water contact recreation activities are expected to occur, fecal coliform is not to exceed a geometric mean of 200 per

100 ml based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. Should water quality and sanitary studies show fecal coliform levels from non-human sources exceed 200/100 ml (geometric mean) occasionally, then the allowable geometric mean fecal coliform shall not exceed 300 per 100 ml in lakes and reservoirs and 500 per 100 ml in free flowing freshwater streams. For the months of November through April, fecal coliform is not to exceed a geometric mean of 1,000 per 100 ml based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours and not to exceed a maximum of 4,000 per 100 ml for any sample. The geometric mean standard is the target for the TMDLs. An implicit and explicit MOS is applied to this standard during development of the TMDLs, as detailed in Section 8.3 of this report.

Lake Jackson is the only one of the 303(d) listed waterbodies in the Ocmulgee River basin which has a designated use classification of recreation. The fecal coliform water quality criteria for protection of the recreation use classification is also established by the *State of Georgia Rules and Regulations for Water Quality Control, Chapter 391-3-6 Revised, July, 2000*, and will be used as the target level for fecal coliform TMDL development for Lake Jackson.

Section 391-3-6-.03 (6) of the *State of Georgia Rules and Regulations for Water Quality Control, Chapter 391-3-6 Revised, July, 2000,* states that for recreational use waters, fecal coliform is not to exceed a geometric mean of 100 per 100 ml for coastal waters or 200 per 100 ml for all other recreational waters, based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. Should water quality and sanitary studies show fecal coliform levels from non-human sources exceed 200 per 100 ml (geometric mean) occasionally, then the allowable geometric mean fecal coliform shall not exceed 300 per 100 ml in lakes and reservoirs and 500 per 100 ml in free flowing freshwater streams. The geometric mean standard is the target for the TMDLs. An implicit and explicit MOS is applied to this standard during development of the TMDLs, as detailed in Section 8.3 of this report.

5.0 WATER QUALITY ASSESSMENT AND DEVIATION FROM TARGET

Compliance with the applicable fecal coliform water quality criteria was assessed for each of the current 303(d) listed streams, based on monitoring data collected from the monitoring stations listed in Table 3.

Water quality data collected during calendar year 1999 for the current 303(d) listed stream segments, which met the regulatory criteria for calculation of a valid geometric mean, are summarized in Table 4. A geometric mean in excess of 200 counts per 100 milliliters during the period May – October, or in excess of 1000 counts per 100 milliliters during the period November – April, provides a basis for adding a stream segment to the 303(d) listing. A single sample in excess of 4000 counts per 100 milliliters can also provide a basis for adding a stream segment to the 303(d) listing. Stream segments that do not have 1999 monitoring data exceeding the above geometric mean or single sample criteria, were placed on the 303(d) as a result of data collected prior to 1999. All water quality data collected during calendar year 1999 for the current 303(d) listed stream segments in the Ocmulgee River basin, including data which did not meet the regulatory criteria for calculation of a valid geometric mean, are provided in Table A-1, in Appendix A of this report.

6.0 SOURCE ASSESSMENT

An important part of the TMDL analysis is the identification of source categories, source subcategories, or individual sources of fecal coliform bacteria in the watershed and the amount of loading contributed by each of these sources. Sources are broadly classified as either point or nonpoint sources.

A point source can be defined as a discernable, confined, and discrete conveyance from which pollutants are or may be discharged to surface waters. Point source discharges of industrial wastewater and treated sanitary wastewater must be authorized by National Pollutant Discharge Elimination System (NPDES) permits. NPDES permitted facilities discharging treated sanitary wastewater are considered primary point sources of fecal coliform bacteria.

Nonpoint sources of fecal coliform bacteria are diffuse sources that cannot be identified as entering a waterbody through a discrete conveyance at a single location. These sources generally, but not always, involve accumulation of fecal coliform bacteria on land surfaces and washoff as a result of storm events. Typical nonpoint sources of fecal coliform bacteria include:

- Wildlife
- Land application of agricultural manure
- Livestock grazing
- Leaking septic systems
- Urban development (including leaking sewer collection lines)
- Animals having access to streams

For nonpoint sources involving agricultural activites, the Natural Resources Conservation Service (NRCS) was consulted for information and parameters to be used to characterize agricultural activities represented in the water quality model.

6.1 Point Sources

There are a number of permitted point source discharges located in the drainage areas of the 303(d) listed stream segments. In addition, three combined sewer overflow (CSO) facilities are located in the headwaters of the South River in Fulton County. The average discharge flow and flow-weighted average fecal coliform loading for these facilities, as calculated from CY1999 Discharge Monitoring Report (DMR) data, are summarized in Table 5. Design flow, and fecal coliform loading based on monthly fecal coliform permit limits, are also provided in Table 5. The locations of these point sources are presented in Appendix G. In the water quality models, the fecal coliform loading rates from these facilities (with the exception of the CSOs) was calculated using the design flow and the permit concentration of 200 counts per 100 ml. This load is considered a conservative estimate of the WLA component as most of the NPDES facilities discharging fecal colirorm use disinfection prior to discharge.

A monthly average fecal coliform concentration of 200 counts per 100 milliliters was assumed for the purpose of calculating the flow-weighted average fecal coliform loading for facilities that did not have an existing fecal coliform permit limit, or for which no DMR data was available for the CY1999 period. Calibration of the water quality model was conducted using DMR data whenever available. In cases where no DMR data was available the fecal coliform loading rate was calculated using the design flow and assuming an average fecal coliform concentration equal to the lesser of 200 counts/ 100 ml and the existing fecal coliform permit limit.

The CSO facilities are currently under a consent decree (EPA, 1999) to meet end-of-pipe criteria for fecal coliform bacteria by 2007. The CSOs are permitted to discharge only under high flow conditions with the WPCP facilities operating at full capacity.

6.2 Nonpoint Source Assessment

6.2.1 Wildlife

Wildlife deposit feces onto land surfaces where it can be transported during storm events to nearby streams. In the water quality model, the wildlife fecal coliform contribution is accounted for in the deer population. The deer population is estimated to be 30 to 45 animals per square mile in this area (Georgia WRD, 1999). The upper limit of 45 deer per square mile has been chosen to account for deer and all other wildlife present in the watershed. It is assumed that the wildlife population remains constant throughout the year, and that wildlife is uniformly distributed on all land classified in the MRLC database as forest, pasture, cropland, and wetlands.

6.2.2 Agricultural Animals

Agricultural animals are also a potential source of several types of fecal coliform loading to streams in the Ocmulgee River basin.

As with wildlife, agricultural livestock grazing on pastureland or forestland deposit their feces onto land surfaces where it can be transported during storm events to nearby streams. Animal access to pasture land varies monthly, resulting in varying fecal coliform loading rates throughout the year. Beef cattle spend all of their time in pasture, while dairy cattle and hogs are confined periodically. All manure from beef cattle is therefore assumed applied to pastureland. The percentage of feces deposited during grazing time is used to estimate the fecal coliform loading rates from pastureland.

Confined livestock operations also generate manure, which can be applied to pastureland and cropland as a fertilizer. Processed agricultural manure from confined hog, dairy cattle, and some poultry operations is generally collected in lagoons and applied to land surfaces during the growing season, at rates which often vary on a monthly basis. It is a basic assumption that the manure is evenly distributed over the land surfaces to which it is applied. Assumptions regarding manure management practices for specific agricultural livestock operations are as follows:

- Poultry litter is normally piled for a period before it is used for manure application. Within the Ocmulgee River basin it is estimated that approximately 100 percent of poultry litter is applied to pastureland, with only a negligible amount applied to cropland. It is assumed that the poultry litter is applied primarily during the period between March and October (inclusive), and that application rates vary monthly.

- Within the Ocmulgee River basin it is estimated that approximately 100 percent of broiler litter is applied to pastureland, with only a negligible amount applied to cropland. It is assumed that the broiler litter is applied year-round, but at variable monthly rates.

- Hog farms in the Ocmulgee River basin operate by confining the animals or allowing them to graze in small pastures or pens. It is assumed that all of the hog manure produced by either farming method is applied to available pastureland, with negligible amounts applied to cropland. Application rates of hog manure to pastureland vary monthly according to management practices. Applications are assumed to be made during the period between March and October (inclusive).

- On dairy farms, the cows are confined for a limited period each day during which time they are fed and milked. This is estimated to be four hours per day for each dairy cow. It is assumed that 100 percent of manure collected during confinement is applied to the available pastureland in the watershed. It is also assumed that the dairy cow manure is applied during the period between February and October (inclusive), as well as in November. Application rates vary monthly according to management practices.

- All manure from beef cattle is assumed applied to pastureland. The beef cow manure is assumed to be applied year-round, and at a constant monthly rate.

- Imported manure is used both on cropland and pastureland at proportions of 75 percent and 25 percent, respectively. It is assumed that the imported manure is applied during the period between February and October (inclusive), as well as in November. Application rates vary monthly.

Agricultural livestock and other unconfined animals (i.e., deer and other wildlife) also often have direct access to streams that pass through pastures, and as such, can impact water quality. Feces deposited into these streams by grazing animals is included in the water quality model as a direct nonpoint source having constant flow and concentration. To calculate the amount of fecal coliform bacteria introduced into streams by cattle, it is assumed that only beef cow populations have access to the streams, and of those, approximately twelve percent will defecate in the stream (personal communication, EPA, Georgia Agribusiness Council, NRCS, University of Georgia, et. al.).

Livestock data for the listed streams in the Ocmulgee River basin are shown in Table 6. This data is based on the 1997 Census of Agriculture and is reported by county. The county data are assigned to the watersheds based on the percentage of agricultural area in each subwatershed classified as pasture/hay. Cattle numbers reported in the census data also represent other breeds of cattle and calves in addition to dairy and beef.

6.2.3 Leaking Septic Systems

Some fecal coliform loading in the Ocmulgee River basin may be attributed to failure of septic systems and illicit discharges of raw sewage. Estimates from county census data of people in each listed stream watershed utilizing septic systems are shown in Table 7. These estimates were updated based on a county-by-county survey conducted by EPD in April-May 2001. It is estimated that there are approximately 2.37 people per household on septic systems (EPA, personal communication). Based on the EPD survey, it is assumed that five percent of the septic systems in the watershed leak. Leaking septic systems are included in the water quality model as a direct nonpoint source having constant flow and concentration. The average fecal coliform concentration of the septic system wastewater reaching a stream was assumed to be 1×10^4 counts per 100 ml.

6.2.4 Urban Development

The Upper Ocmulgee basin includes two major population centers: the eastern edge of the Atlanta metropolitan area, and the northeast portion of the City of Macon. Fecal coliform loading from urban areas is potentially attributable to multiple sources including: storm water runoff, leaks and overflows from sanitary sewer systems; illicit discharges of sanitary waste; runoff from improper disposal of waste materials; leachate from operating and closed landfills; leaking septic systems, and domestic animals. Urban runoff and storm water processes are considered to be significant contributors to fecal coliform concentrations in some Ocmulgee River subwatersheds.

To estimate the load of fecal coliform bacteria from leaking sewer collection lines, it was assumed that up to five percent of the permitted design flow of a municipal water pollution control plant (WPCP) was lost through leaks. The average fecal coliform bacteria concentration in the untreated wastewater was assumed to be 1×10^6 counts/100 ml (EPA, "Protocol for Developing Pathogen TMDLs", 2001).

7.0 ANALYTICAL APPROACH

Establishing the relationship between in-stream water quality and source loading is an important component of TMDL development. It allows the determination of the relative contribution of sources to total pollutant loading and the evaluation of potential changes to water quality resulting from implementation of various management options. This relationship can be developed using a variety of techniques ranging from qualitative assumptions based on scientific principles to numerical computer modeling. In this section, the numerical modeling techniques developed to simulate fecal coliform bacteria fate and transport in the watershed are discussed.

7.1 Model Selection

A dynamic computer model was selected for fecal coliform analysis in order to: a) simulate the time varying nature of fecal coliform deposition on land surfaces and transport to receiving waters; b) incorporate seasonal effects on the production and fate of fecal coliform bacteria; and c) identify the critical condition for the TMDL analysis. Several computer based tools were also utilized to generate input data for the model.

The Nonpoint Source Model (NPSM) is a watershed model capable of simulating nonpoint source runoff and associated pollutant loadings, account for point source discharges, and performing flow and water quality routing through stream reaches. NPSM is based on the Hydrologic Simulation Program - Fortran (HSPF). In these TMDLs, NPSM was used to simulate point source discharges, simulate the deposition and transport of fecal coliform bacteria from land surfaces, and compute the resulting water quality response.

In addition to NPSM, the Watershed Characterization System (WCS), a geographic information system (GIS) tool, was used to display, analyze, and compile available information to support water quality model simulations for the Ocmulgee River basin. This information includes land use categories, point source dischargers, soil types and characteristics, population data (human and livestock), and stream characteristics. Results of the WCS characterization are input to a spreadsheet developed by Tetra Tech, Inc. to estimate NPSM input parameters associated with fecal coliform buildup (loading rates) and washoff from land surfaces. In addition, the spreadsheet can be used to estimate direct sources of fecal coliform loading to water bodies from leaking septic systems and animals having access to streams. Information from the WCS and spreadsheet tools were used as initial input for variables in the NPSM model.

7.2 Model Set Up

The Ocmulgee River basin was delineated into 258 subwatersheds in order to characterize relative fecal coliform bacteria contributions from significant contributing drainage areas (see Figures 4A – 4C).

Boundaries were constructed so that subwatershed "pour points" coincided, when possible, with water quality monitoring stations or USGS flow gages. Watershed delineation was based on the Reach File 3 (Rf3) stream coverage and Digital Elevation Model (DEM) data. This discretization allows management and load reduction alternatives to be varied by subwatershed. The structure of the watershed models for the subject stream segments of this report are presented in Appendix G.

An important factor influencing model results is the precipitation data contained in the meteorological data file used in the simulation. The pattern and intensity of rainfall affects the build-up and wash-off of fecal coliform bacteria from the land into the streams, as well as the dilution potential of the stream. Precipitation data from the EarthInfo CD set were used for simulations in all subwatersheds. Details regarding the methods and data sets are presented in Appendix B.

7.3 Model Calibration

Calibration of the watershed model included both hydrology and water quality components. The hydrology calibration was performed first and involved adjustment of the model parameters used to represent the hydrologic cycle until acceptable agreement was achieved between simulated flows and historic stream flow data from a USGS stream gaging station in the watershed for the same period of time. Model parameters adjusted include: evapotranspiration, infiltration, upper and lower zone storage, groundwater storage, recession, losses to the deep groundwater system, and interflow discharge. Details of hydrologic calibrations are presented in Appendix B. Hydrology calibrations are presented in Appendix C, along with USGS gages used for the flow calibrations. Calibrated models were then subjected to model validation to ensure that generated model streamflows for each of the impaired segments were acceptable. Model generated hydrographs for each of the impaired streams are presented in Appendix D.

The model was also calibrated for water quality. Appropriate model parameters were adjusted to obtain acceptable agreement between simulated instream fecal coliform concentrations and observed data collected at the sampling stations indicated in Table 3. Details of water quality calibrations are presented in Appendix B. Water quality calibrations are presented in Appendix E.

8.0 DEVELOPMENT OF TOTAL MAXIMUM DAILY LOAD

The TMDL process quantifies the amount of a pollutant that can be assimilated in a waterbody, identifies sources of the pollutant, and recommends regulatory or other actions to be taken to achieve compliance with applicable water quality standards based on the relationship between pollution sources and in-stream water quality conditions. A TMDL can be expressed as the sum of all point source loads (Waste Load Allocations), nonpoint source loads (Load Allocations), and an appropriate margin of safety (MOS) which takes into account any uncertainty concerning the relationship between effluent limitations and water quality:

$$TMDL = \Sigma\ WLAs + \Sigma\ LAs + MOS$$

The objective of a TMDL is to allocate loads among known pollutant sources throughout a watershed so that appropriate control measures can be implemented and water quality standards achieved. 40 CFR §130.2 (i) states that TMDLs can be expressed in terms of mass per time (e.g. pounds per day), toxicity, or other appropriate measure. For fecal coliform bacteria, the TMDLs are expressed as counts per 30 days.

8.1 Critical Conditions

The critical condition for nonpoint source fecal coliform loading is an extended dry period followed by a rainfall runoff event. During the dry weather period, fecal coliform bacteria builds up on the land surface, and is washed off by rainfall. The critical condition for point source loading occurs during periods of low stream flow when dilution is minimized. Both conditions are simulated in the water quality model.

A definitive time period was used to simulate a continuous 30-day geometric mean concentration to compare to the target. This time period contained a range of hydrological conditions that included both low and high stream flows from which critical conditions were identified and used to derive the TMDL values.

The simulated 30-day geometric mean concentrations for existing conditions are presented in Appendix F. From these figures, critical conditions can be determined. The 30-day critical period in the model is the period preceding the largest simulated violation of the geometric mean standard (EPA, 1991). During periods where the model predicted extremely low stream flows, the model often became unstable and exhibited extreme positive or negative spikes. These portions of the simulation were excluded from consideration of the critical period. Meeting water quality standards during this period ensures that water quality standards can be achieved throughout the reviewed time period. For the listed segments in the Ocmulgee River basin, the critical period used in development of the TMDLs is given in Table 8.

8.2 Existing Conditions

The existing fecal coliform load for each of the 303(d) listed waterbodies in the Ocmulgee River basin was determined in the following manner:

- The calibrated model, corresponding to the portion of the Ocmulgee River basin that is upstream of the pour point of the listed waterbody segment was run for a time period that included the critical condition. This critical time period is provided for each listed segment in Table 8.

- The existing fecal coliform load for each listed segment is represented as the sum of fecal coliform loads from NPDES permitted discharges, discharge loads of direct nonpoint sources (e.g. animal access to streams, illicit discharges of fecal coliform bacteria, failing septic systems, or leaking sewer collection lines), and the fecal coliform loads going to surface waters from all land uses (e.g. surface runoff), cumulated over the 30 day critical period. The existing loading rates given in Table 8 considers a die-off and absorption by soil for fecal coliform applied to land (during accumulation and before transported to the stream), but does not consider fecal coliform decay (die-off) during transport to the stream. The existing in-stream fecal coliform concentration given in Table 8, includes in-stream decay of the fecal coliform.

Model results indicate that nonpoint sources related to agricultural and urban land uses have the greatest impact on the fecal coliform bacteria loading in the Ocmulgee River basin. Direct inputs of fecal coliform bacteria from "other sources" (i.e., animal access to streams, illicit discharges of fecal coliform bacteria, failing septic systems, and leaking sewer collection lines) are also shown to increase bacteria loading in the watershed. Reductions in these loading rates reduce the in-stream fecal coliform bacteria levels. Nonpoint source loading rates and the in-stream geometric mean concentration representing existing conditions during the critical period are shown in Table 8.

In general, point source loads from NPDES facilities, with the exception of the CSOs, do not significantly contribute to the impairment of the listed stream segments since discharges from these facilities are required to be treated to levels corresponding to instream water quality criteria. Table 5 provides point source loads from NPDES facilities for existing conditions based on DMRs, and loads for TMDL conditions based on permitted facility flows and limits. As shown in this table, most facilities for which data is available have existing (i.e. based on DMR reporting) loads that are significantly lower than the maximum load at the permit limits.

8.3 Margin of Safety

There are two methods for incorporating an MOS in the analysis: a) implicitly incorporate the MOS using conservative model assumptions to develop allocations; or b) explicitly specify a portion of the TMDL as the MOS and use the remainder for allocations. In these TMDLs, an implicit MOS was incorporated through the use of conservative modeling assumptions and a continuous simulation that incorporates a range of meteorological events. Conservative modeling assumptions used include: septic systems discharging directly into the streams; development of the TMDL using loads based on the design flow and fecal coliform permit limits of NPDES facilities; and all land uses connected directly to streams. An explicit MOS of 10% was also included in the TMDLs by requiring the simulated geometric mean concentration to be 180 counts / 100 ml, rather than the standard of 200 counts / 100 ml.

8.4 Determination of TMDL, WLA, and LA

The TMDL is the total amount of pollutant that can be assimilated by a water body while maintaining water quality standards. Fecal coliform bacteria TMDLs are expressed as counts per 30-day period since this is how the water quality standard is expressed. The TMDL, therefore, represents the maximum fecal coliform bacteria load that can be assimilated by a stream during the critical 30-day period while maintaining the fecal coliform bacteria water quality standard of 200 counts / 100 ml. As previously stated, the TMDL is calculated using the equation:

$$TMDL = \Sigma\ WLAs + \Sigma\ LAs + MOS$$

With MOS = 20 counts / 100 ml (i.e. a 10% explicit MOS), the TMDL, $\sum$WLA, and $\sum$LA were determined according to the following procedure:

- The calibrated model, corresponding to the portion of the watershed that is upstream of the pour point of the listed waterbody segment was run for a time period that included the critical condition as specified in Table 8.

- Existing NPDES permitted facilities and any known future facility discharges were assumed to discharge at design flows and the fecal coliform permit limit of 200 counts/100 ml.

- Fecal coliform land loading variables and the magnitude of loading from sources modeled as “other direct sources” were adjusted within reasonable range of known values until the resulting fecal coliform concentration at the pour point of the listed water body segment was less than or equal to 180 counts/100ml. (i.e. the water quality standard of 200 counts/100ml minus 20 counts/100ml [i.e. a 10% explicit MOS]).

- The ∑WLA is the load associated with the daily discharge loads of all modeled NPDES permitted facilities summed over the 30-day critical period. The discharge load for each facility represents the design flow at a fecal coliform concentration of 200 counts/100 ml (permitted limit).

- The ∑LA is the daily fecal coliform load indirectly going to surface waters from all modeled land use areas as a result of buildup/washoff processes plus the daily discharge load sources modeled as “other direct sources” and the result summed over the 30-day critical period.

- The TMDL for the 30 day critical period is ∑WLAs plus ∑LAs.

The TMDLs, WLAs, and LAs for the listed water bodies are summarized in Table 9.

8.4.1 Waste Load Allocations

There are 55 NPDES permitted facilities that discharge fecal coliform bacteria in the Ocmulgee River basin. Future facility permits will require end-of-pipe limits equivalent to the water quality standard of 200 counts/100 ml or less.

8.4.2 Load Allocations

There are two modes of transport for nonpoint source fecal coliform bacteria loading in the model. First, there are loads to the stream independent of precipitation, and are modeled as "other direct sources." These include sources such as failing septic systems, leachate from landfills, animals in the stream, and leaking sewer system collection lines. The second mode involves loading resulting from fecal coliform accumulation on land surfaces and wash-off during storm events. Fecal coliform applied to land is subject to a die-off rate and an absorption rate before it is transported to the stream.

Model results were analyzed to determine which sources of fecal coliform have the greatest impact on the fecal coliform bacteria loadings in the Ocmulgee River basin. The results of this analysis are indicated in Table 10, for each of the 303(d) listed segments for which a TMDL was developed. Wasteload and Load allocation scenarios that would meet in-stream water quality standards for each of the 303(d) listed streams analyzed in the Ocmulgee River basin are provided in Table 10. Possible load reduction scenarios that would meet in-stream water quality standards for each of the 303(d) listed streams analyzed in the Ocmulgee River basin is provided in Table 11.

Best management practices (BMPs) that could be used to implement this TMDL include controlling pollution from agriculture and urban runoff, identification and elimination of illicit discharges and other unknown “direct sources” of fecal coliform bacteria to the streams, and repair of leaking sewer collection lines and failing septic systems. The South River is impacted by CSOs. For this stream to meet water quality standards, the load from CSOs would need to meet water quality criteria at end-of-pipe. Compliance with the consent decree between the City of Atlanta and EPA should result in obtainment of water quality standards. Loading from agricultural sources may be minimized by adoption of NRCS resource management practices. NRCS practices include measures such as covering manure stacks exposed to the environment; reducing animal access to streams; and applying manure to croplands (if applicable) at agronomic rates. Measures which can reduce urban contributions include: repair and renovation of leaking sewer collection systems; reduction of sewer overflows and surcharges by use of separate conduit systems for domestic wastewater and stormwater; encouragement of households and businesses to connect to public sewer systems and reduce the population using septic systems.

Additional monitoring and characterization of the watershed should be conducted to verify the various other direct sources of fecal coliform bacteria in the watershed.

8.4.3 Seasonal Variation

Seasonal variation was incorporated in the continuous simulation water quality model by using varying monthly loading rates and daily meteorological data.

9.0 RECOMMENDATIONS

The TMDL analysis was performed using the best data available to specify WLAs and LAs that will meet the water quality criteria for fecal coliform in the Ocmulgee River basin so as to support the use classification specified for each of the listed segments in Table 2. The following recommendations and strategies are targeted toward source identification, collection of data to support additional modeling and evaluation, and subsequent reduction in sources that are causing impairment of water quality.

9.1 Point Source Facilities

All discharges from point source facilities are required to be in compliance with the conditions of their NPDES permit at all times. All permitted facilities with the potential to discharge fecal coliform which do not currently have a fecal coliform limit will be given a fecal coliform limit of not more than 200 counts / 100 ml during the permit reissuance process.

9.2 Urban Sources of Fecal Coliform Loading

Urban sources of fecal coliform can best be addressed using a stategy which involves public participation and intergovernmental coordination to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques, public education, and other appropriate methods and provisions. The following activities and programs conducted by cities, counties, and state agencies are recommended:

- Monitoring programs to identify the types and extent of fecal coliform water quality problems, relative degradation or improvement over time, areas of concern, and source identification;

- Requirements that all new and replacement sanitary sewage systems are designed to minimize discharges from the system into storm sewer systems;

- Mechanisms for reporting and correcting illicit connections, breaks, surcharges, and general sanitary sewer system problems;

- Sustained compliance with NPDES permit discharge requirements.

9.3 Agricultural Sources of Fecal Coliform Loading

The Georgia Environmental Protection Division (EPD) should coordinate with the Georgia Soil and Water Conservation Commission, and the Natural Resources Conservation Service (NRCS) to address issues concerning fecal coliform loading from agricultural lands in the Ocmulgee River basin. It is recommended that information (such as livestock populations by subwatershed, animal access to streams, manure application practices, etc.) be evaluated periodically so that watershed models can be updated to reflect current conditions. It is further recommended that BMPs be utilized to reduce the amount of fecal coliform bacteria transported to surface waters from agricultural sources to the maximum extent practicable.

9.4 Stream Monitoring

Further monitoring of the fecal coliform concentrations at current and additional water quality monitoring stations in the watershed is needed to characterize sources of fecal coliform bacteria and document future reduction of loading. Georgia's watershed management approach specifies a five-year cycle for planning and assessment. Watersheds will be examined (or re-examined) as appropriate, on a rotating basis.

9.5 Future Efforts

This TMDL represents the first phase of a long-term process to reduce fecal coliform loading to meet water quality standards in the Ocmulgee River basin. Implementation strategies will be reviewed and the TMDLs will be refined as necessary in the next phase (next five-year cycle). The phased approach will support progress toward water quality standards attainment in the future. In accordance with USEPA TMDL guidance, these TMDLs may be revised based on results of future monitoring and source characterization data efforts.

10.0 Public Participation

A thirty day public notice was provided for this TMDL document. During the public notice period, the availability of the TMDLs was public noticed, a copy of the TMDLs was provided as requested, and the public was invited to provide comments on the TMDLs.

11.0 Initial Implementation Plan

EPD has coordinated with EPA to prepare this Initial TMDL Implementation Plan for this TMDL. EPD has also established a plan and schedule for development of a more comprehensive implementation plan after this TMDL is established. EPD and EPA have executed a Memorandum of Understanding that documents the schedule for developing the more comprehensive plans. This Initial TMDL Implementation Plan includes a list of best management practices and provides for an initial implementation demonstration project to address one of the major sources of pollutants identified in this

TMDL while State and/or local agencies work with local stakeholders to develop a revised TMDL implementation plan. It also includes a process whereby EPD and/or Regional Development Centers (RDCs) or other EPD contractors (hereinafter, "EPD Contractors") will develop expanded plans (hereinafter, "Revised TMDL Implementation Plans").

This Initial TMDL Implementation Plan, written by EPD and for which EPD and/or the EPD Contractor are responsible, contains the following elements.

1. EPA has identified a number of management strategies for the control of nonpoint sources of pollutants, representing some best management practices. The "Management Measure Selector Table shown below identifies these management strategies by source category and pollutant. Nonpoint sources are the primary cause of excessive pollutant loading in most cases. Any wasteload allocations in this TMDL will be implemented in the form of water-quality based effluent limitations in NPDES permits issued under CWA Section 402. See 40 C.F.R. § 122.44(d)(1)(vii)(B). NPDES permit discharges are a secondary source of excessive pollutant loading, where they are a factor, in most cases.

2. EPD and the EPD Contractor will select and implement one or more best management practice (BMP) demonstration projects for each River Basin. The purpose of the demonstration projects will be to evaluate by River Basin and pollutant parameter the site-specific effectiveness of one or more of the BMPs chosen. EPD intends that the BMP demonstration project be completed before the Revised TMDL Implementation Plan is issued. The BMP demonstration project will address the major category of contribution of the pollutant(s) of concern for the respective River Basin as identified in the TMDLs of the watersheds in the River Basin. The demonstration project need not be of a large scale, and may consist of one or more measures from the Table or equivalent BMP measures proposed by the EPD Contractor and approved by EPD. Other such measures may include those found in EPA's "Best Management Practices Handbook", the "NRCS National Handbook of Conservation Practices, or any similar reference, or measures that the volunteers, etc., devise that EPD approves. If for any reason the EPD Contractor does not complete the BMP demonstration project, EPD will take responsibility for doing so.

3. As part of the Initial TMDL Implementation Plan the EPD brochure entitled "Watershed Wisdom -- Georgia's TMDL Program" will be distributed by EPD to the EPD Contractor for use with appropriate stakeholders for this TMDL, and a copy of the video of that same title will be provided to the EPD Contractor for its use in making presentations to appropriate stakeholders, on TMDL Implementation plan development.

4. If for any reason an EPD Contractor does not complete one or more elements of a Revised TMDL Implementation Plan, EPD will be responsible for getting that (those) element(s) completed, either directly or through another contractor.

5. The deadline for development of a Revised TMDL Implementation Plan, is the end of August, 2003.

6. The EPD Contractor helping to develop the Revised TMDL Implementation Plan, in coordination with EPD, will work on the following tasks involved in converting the Initial TMDL Implementation Plan to a Revised TMDL Implementation Plan:

A. Generally characterize the watershed;
B. Identify stakeholders;
C. Verify the present problem to the extent feasible and appropriate, (e.g., local monitoring);
D. Identify probable sources of pollutant(s);
E. For the purpose of assisting in the implementation of the load allocations of this TMDL, identify potential regulatory or voluntary actions to control pollutant(s) from the relevant nonpoint sources;
F. Determine measurable milestones of progress;
G. Develop monitoring plan, taking into account available resources, to measure effectiveness; and
H. Complete and submit to EPD the Revised TMDL Implementation Plan.

7. The public will be provided an opportunity to participate in the development of the Revised TMDL Implementation Plan and to comment on it before it is finalized.

The Revised TMDL Implementation Plan will supersede this Initial TMDL Implementation Plan when the Revised TMDL Implementation Plan is approved by EPD.

Management Measure Selector Table

Land Use	**Management Measures**	Fecal Coliform	Dissolved Oxygen	pH	Sediment	Temperature	*Toxicity*	*Mercury*	Metals (copper, lead, zinc, cadmium)	PCBs, toxaphene
Agriculture	1. Sediment & Erosion Control	_	_		_	_				
	2. Confined Animal Facilities	_	_							
	3. Nutrient Management	_	_							
	4. Pesticide Management		_							
	5. Livestock Grazing	_	_		_	_				
	6. Irrigation		_		_	_				
Forestry	1. Preharvest Planning				_	_				
	2. Streamside Management Areas	_	_		_	_				
	3. Road Construction &Reconstruction		_		_	_				
	4. Road Management		_		_	_				
	5. Timber Harvesting		_		_	_				
	6. Site Preparation & Forest Regeneration		_		_	_				
	7. Fire Management	_	_	_	_	_				
	8. Revegetation of Disturbed Areas	_	_	_	_	_				
	9. Forest Chemical Management		_			_				
	10. Wetlands Forest Management	_	_	_		_		_		

Land Use	**Management Measures**	Fecal Coliform	Dissolved Oxygen	pH	Sediment	Temperature	*Toxicity*	*Mercury*	Metals (copper, lead, zinc, cadmium)	PCBs, toxaphene
Urban	1. New Development	–	–		–	–			–	
	2. Watershed Protection & Site Development	–	–		–	–		–	–	
	3. Construction Site Erosion and Sediment Control		–		–	–				
	4. Construction Site Chemical Control		–							
	5. Existing Developments	–	–		–	–			–	
	6. Residential and Commercial Pollution Prevention	–	–							
Onsite Wastewater	1. New Onsite Wastewater Disposal Systems	–	–							
	2. Operating Existing Onsite Wastewater Disposal Systems	–	–							
Roads, Highways and Bridges	1. Siting New Roads, Highways & Bridges	–	–		–	–			–	
	2. Construction Projects for Roads, Highways and Bridges		–		–	–				
	3. Construction Site Chemical Control for Roads, Highways and Bridges		–							
	4. Operation and Maintenance-Roads, Highways and Bridges	–	–			–			–	

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FIGURES

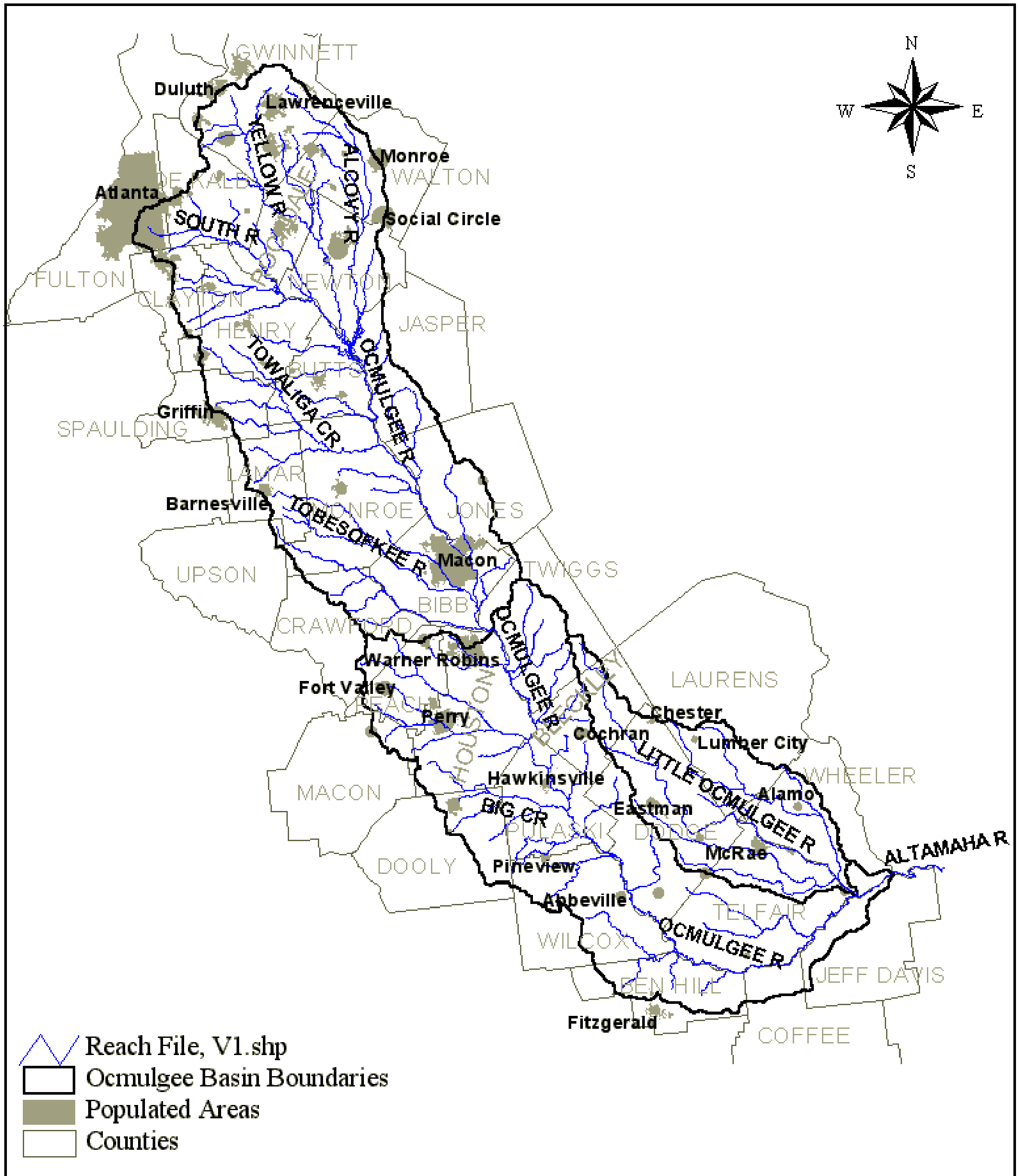


Figure 1 - Ocmulgee River Basin

9 0 9 18 27 36 45 Miles

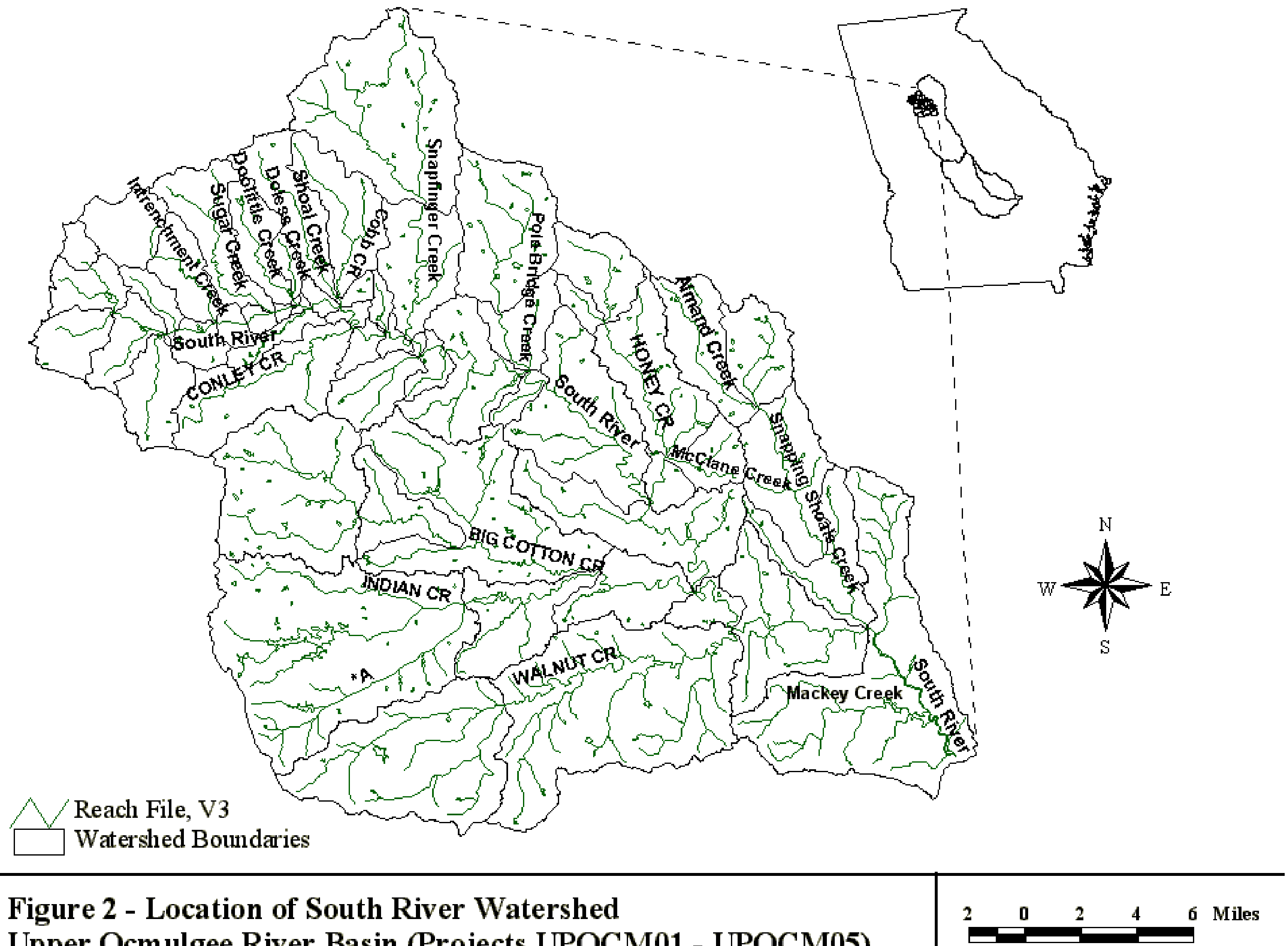


Figure 2 - Location of South River Watershed Upper Ocmulgee River Basin (Projects UPOCM01 - UPOCM05).

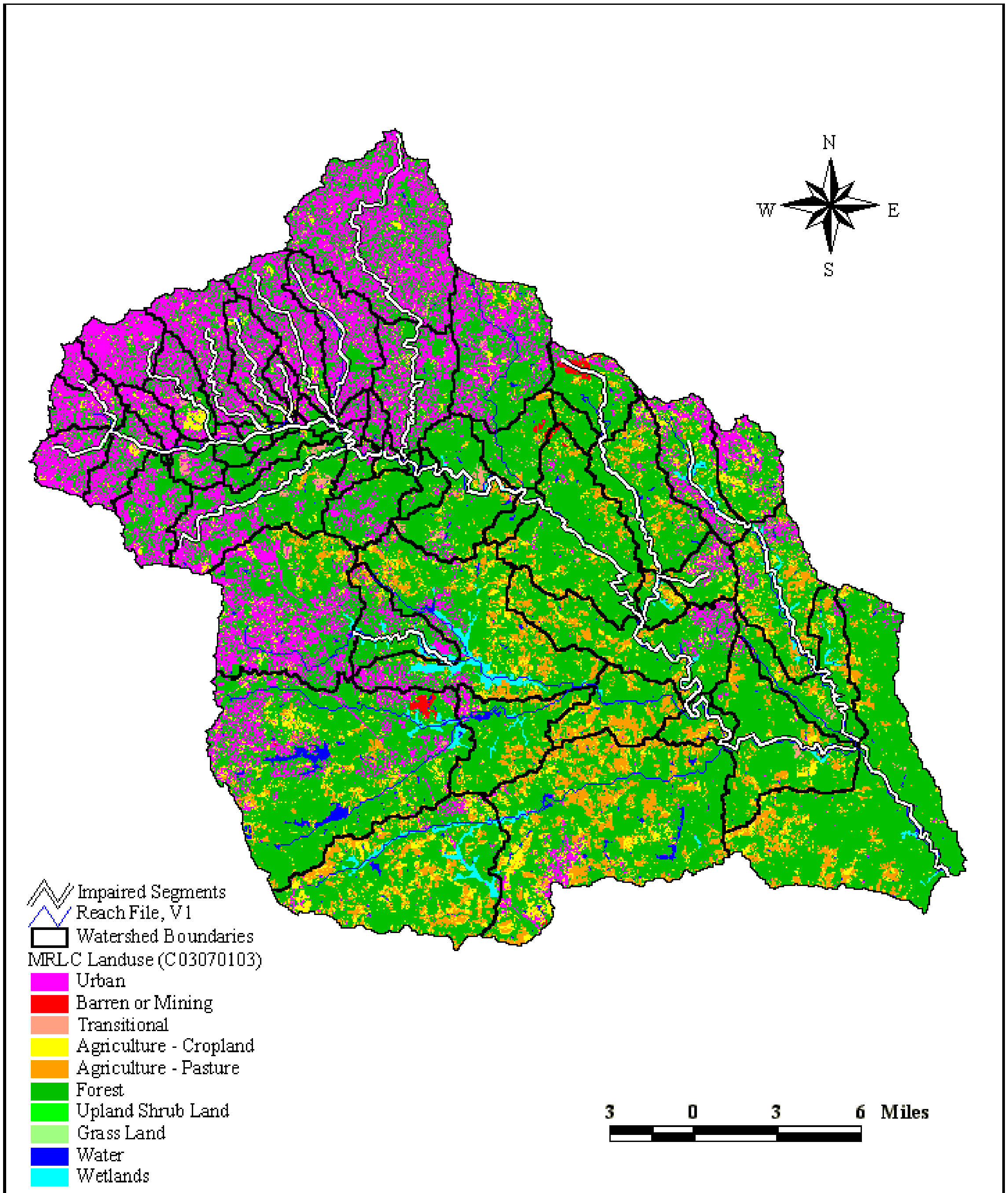


Figure 3 - Land Use Distribution.
South River Watershed
Upper Ocmulgee River Basin (Projects UPOCM01 - UPOCM05)

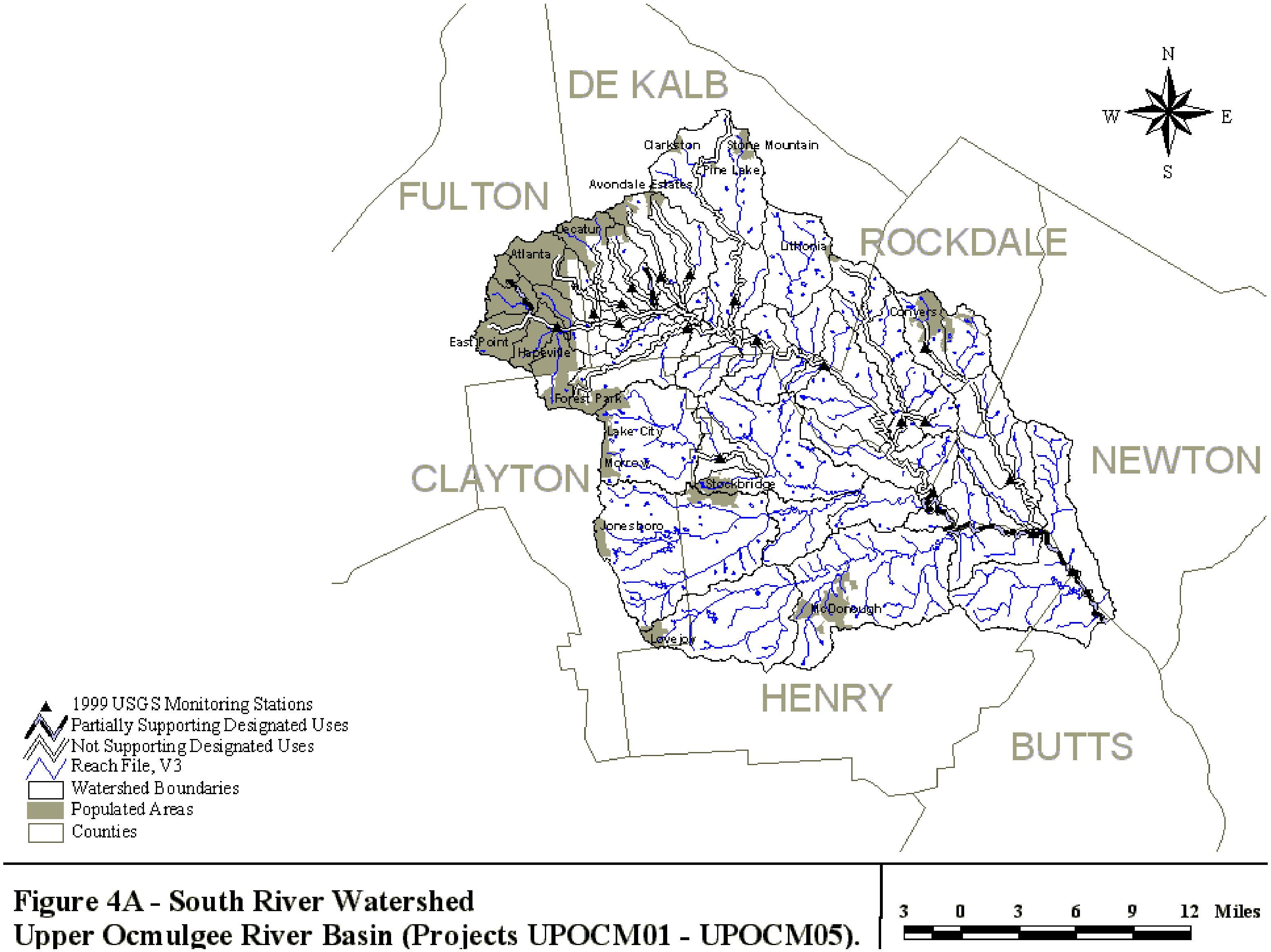


Figure 4A - South River Watershed
Upper Ocmulgee River Basin (Projects UPOCM01 - UPOCM05).

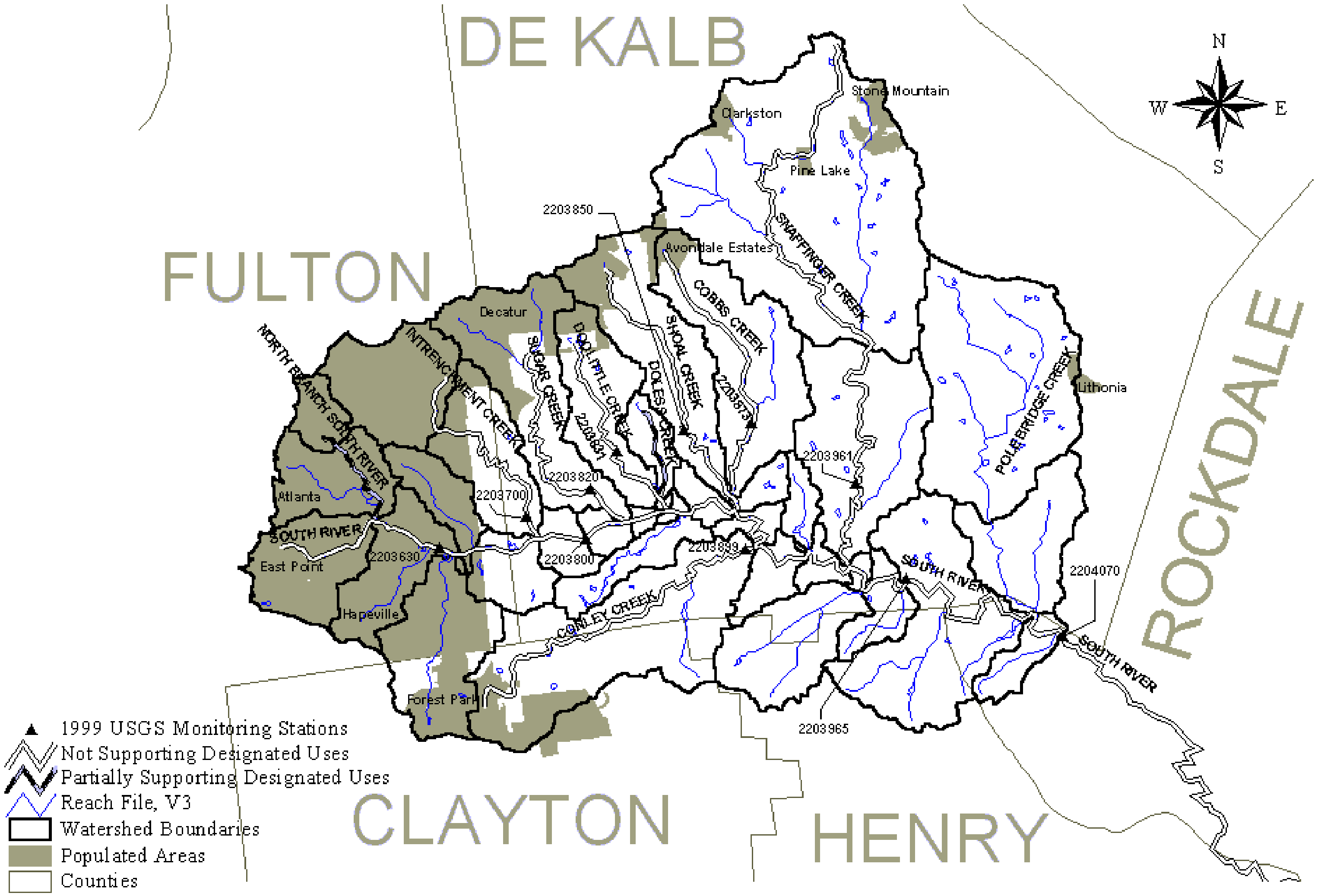


Figure 4B - South River Watershed
Upper Ocmulgee River Basin (Projects UPOCM01 - UPOCM02).

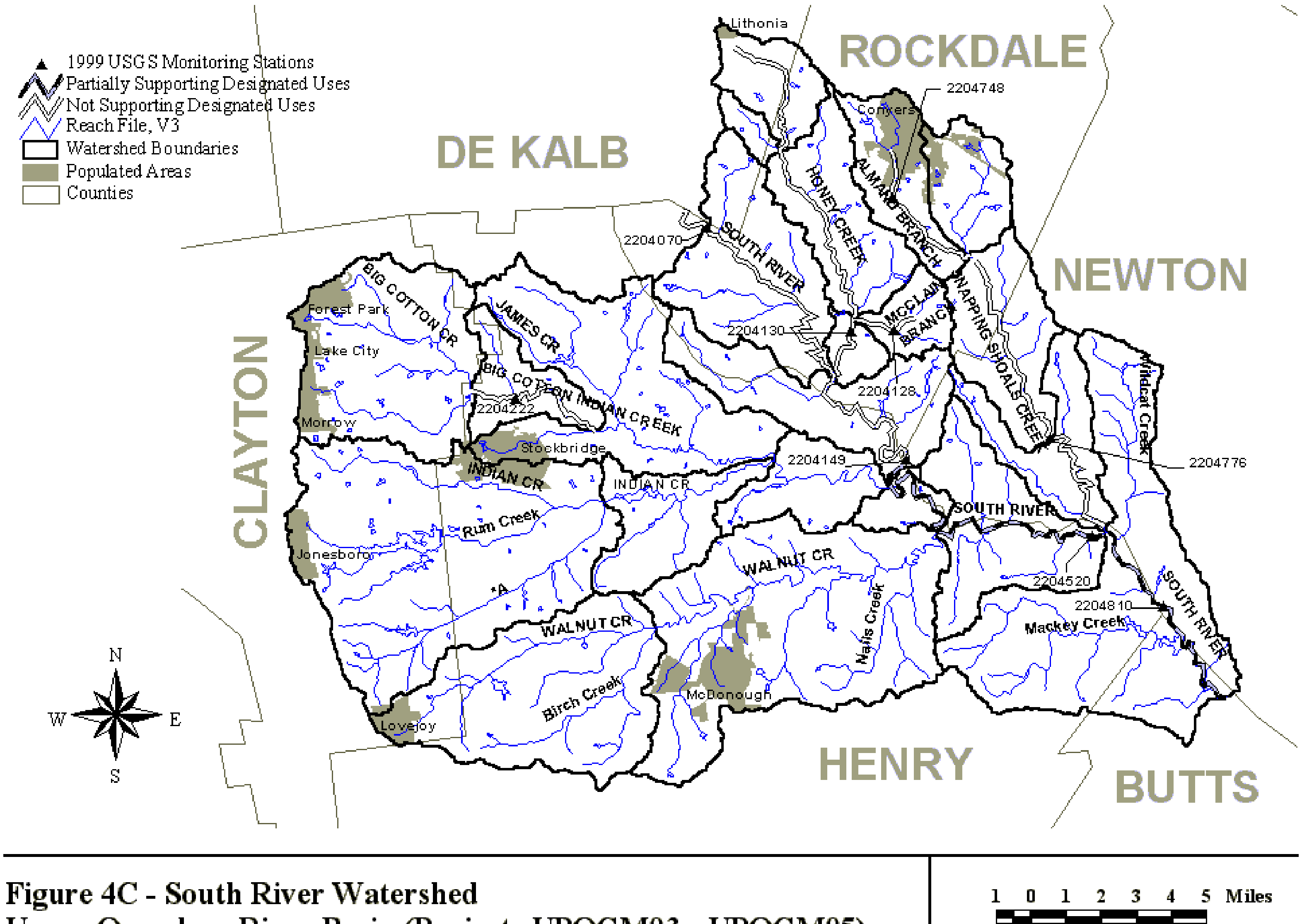


Figure 4C - South River Watershed
Upper Ocmulgee River Basin (Projects UPOCM03 - UPOCM05).

TABLES

Table 1 Land Use Distribution for Ocmulgee River Basin

Stream/Segment	Land Use Categories - in units of acres (percent)																
	Bare Rock/Sand/Clay	Deciduous Forest	Emergent Herbaceous Wetlands	Evergreen Forest	High Intensity Commercial/Industrial/Transportation	Low Intensity Commercial/Industrial/Transportation	High Intensity Residential	Low Intensity Residential	Mixed Forest	Open Water	Other Grasses Urban/Recreational	Pasture/Hay	Quarries/Strip Mines/Gravel Pits	Row Crops	Transitional	Woody Wetlands	Unclassified
Alcovy River (Cedar Creek to Bay Creek)	2 (0.0)	14430 (36.9)	17 (0.0)	5920 (15.1)	995 (2.6)	0 (0.0)	254 (0.7)	934 (2.4)	9056 (23.2)	225 (0.6)	658 (1.7)	4322 (11.1)	0 (0.0)	1306 (3.3)	173 (0.4)	804 (2.1)	0 (0.0)
Alligator Creek (Batson Creek to Lime Sink Creek)	TBD	TBD	TBD	TBD	TBD	0 (0.0)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0 (0.0)
Almand Branch (Tanyard Branch to Snapping Shoals)	0 (0.0)	1046 (17.7)	20 (0.3)	880 (14.9)	610 (10.3)	0 (0.0)	153 (2.6)	832 (14.1)	949 (16.0)	35 (0.6)	286 (4.8)	375 (6.3)	0 (0.0)	309 (5.2)	4 (0.07)	421 (7.1)	0 (0.0)
Bay Creek (Headwaters to Beaver Creek)	TBD	TBD	TBD	TBD	TBD	0 (0.0)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0 (0.0)
Beaver Ruin Creek (Gwinnett County)	0 (0.0)	914 (14.9)	89 (1.5)	441 (7.2)	1007 (16.4)	0 (0.0)	792 (12.9)	1627 (26.6)	740 (12.1)	98 (1.6)	192 (3.1)	0 (0.0)	0 (0.0)	0 (0.0)	159 (2.6)	70 (1.1)	0 (0.0)
Big Cotton Indian Creek (Panther Creek to Brush Creek)	12 (0.0)	19675 (24.4)	102 (0.1)	14501 (18.0)	3917 (4.9)	0 (0.0)	1339 (1.7)	7779 (9.6)	16253 (20.1)	1505 (1.9)	1486 (1.8)	7539 (9.3)	287 (0.4)	3822 (4.7)	229 (0.3)	2361 (2.9)	0 (0.0)

Stream/Segment	Land Use Categories - in units of acres (percent)																
	Bare Rock/Sand/Clay	Deciduous Forest	Emergent Herbaceous Wetlands	Evergreen Forest	High Intensity Commercial/Industrial/Transportation	Low Intensity Commercial/Industrial/Transportation	High Intensity Residential	Low Intensity Residential	Mixed Forest	Open Water	Other Grasses Urban/Recreational	Pasture/Hay	Quarries/Strip Mines/Gravel Pits	Row Crops	Transitional	Woody Wetlands	Unclassified
Big Flat Creek (Headwaters to Flat Creek)	0 (0.0)	3968 (32.5)	62 (0.5)	1240 (10.2)	140 (1.2)	0 (0.0)	51 (0.4)	188 (1.5)	1907 (15.6)	34 (0.3)	101 (0.8)	3155 (25.8)	0 (0.0)	938 (7.7)	66 (0.5)	367 (3.0)	0 (0.0)
Big Haynes Creek (Brushy Creek to Little Panther Creek)	0 (0.0)	4440 (20.5)	3 (0.0)	4328 (20.0)	297 (1.4)	0 (0.0)	139 (0.6)	1030 (4.8)	5485 (25.3)	210 (1.0)	434 (2.0)	3946 (18.2)	0 (0.0)	1320 (6.1)	1 (0.0)	40 (0.2)	0 (0.0)
Big Haynes Creek (Headwaters to Brushy Creek)	0 (0.0)	4042 (19.7)	3 (0.0)	4123 (20.0)	292 (1.4)	0 (0.0)	139 (0.7)	1029 (5.0)	5154 (25.1)	199 (1.0)	428 (2.1)	3866 (18.8)	0 (0.0)	1256 (6.1)	1 (0.0)	40 (0.2)	0 (0.0)
Big Haynes Creek (Little Haynes Creek to Yellow River)	1 (0.0)	14429 (27.4)	26 (0.1)	10708 (20.3)	560 (1.1)	0 (0.0)	169 (0.3)	1178 (2.2)	12796 (24.3)	453 (0.9)	606 (1.2)	7568 (14.4)	0 (0.0)	2973 (5.7)	39 (0.1)	1154 (2.2)	0 (0.0)
Big Indian Creek (Mossy Creek to Ocmulgee River)	TBD	TBD	TBD	TBD	TBD	0 (0.0)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0 (0.0)
Big Sandy Creek (Aboothlacoosta Creek to Ocmulgee River)	TBD	TBD	TBD	TBD	TBD	0 (0.0)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0 (0.0)

Stream/Segment	Land Use Categories - in units of acres (percent)																
	Bare Rock/Sand/Clay	Deciduous Forest	Emergent Herbaceous Wetlands	Evergreen Forest	High Intensity Commercial/Industrial/Transportation	Low Intensity Commercial/Industrial/Transportation	High Intensity Residential	Low Intensity Residential	Mixed Forest	Open Water	Other Grasses Urban/Recreational	Pasture/Hay	Quarries/Strip Mines/Gravel Pits	Row Crops	Transitional	Woody Wetlands	Unclassified
Bromolow Creek (Headwaters to Beaver Ruin Creek)	0 (0.0)	921 (13.7)	75 (1.1)	770 (11.4)	1107 (16.4)	0 (0.0)	518 (7.7)	1684 (25.0)	1073 (15.9)	13 (0.2)	354 (5.3)	1 (0.0)	0 (0.0)	0 (0.0)	32 (0.5)	201 (3.0)	0 (0.0)
Cabin Creek (Headwaters Griffin to Towaliga River)	TBD	TBD	TBD	TBD	TBD	0 (0.0)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0 (0.0)
Camp Creek (Headwaters to Jackson Creek)	0 (0.0)	738 (15.0)	0 (0.0)	826 (16.8)	370 (7.5)	0 (0.0)	179 (3.6)	1103 (22.4)	1243 (25.3)	8 (0.2)	191 (3.9)	30 (0.6)	0 (0.0)	111 (2.3)	120 (2.4)	0 (0.0)	0 (0.0)
Cedar Creek (Headwaters to Alcovy River)	0 (0.0)	1889 (48.4)	0 (0.0)	493 (12.6)	4 (0.1)	0 (0.0)	0 (0.0)	1 (0.0)	586 (15.0)	2 (0.1)	0 (0.0)	667 (17.1)	0 (0.0)	191 (4.9)	14 (0.4)	58 (1.5)	0 (0.0)
Cobbs Creek (Headwaters to Shoal Creek)	0 (0.0)	674 (10.9)	0 (0.0)	837 (13.5)	301 (4.9)	0 (0.0)	449 (7.3)	2955 (47.8)	777 (12.6)	7 (0.1)	148 (2.4)	0 (0.0)	0 (0.0)	7 (0.1)	27 (0.4)	0 (0.0)	0 (0.0)
Conley Creek (Headwaters to South River)	0 (0.0)	2613 (27.4)	0 (0.0)	1522 (16.0)	1084 (11.4)	0 (0.0)	248 (2.6)	1239 (13.0)	1958 (20.5)	28 (0.3)	239 (2.5)	154 (1.6)	0 (0.0)	187 (2.0)	265 (2.8)	0 (0.0)	0 (0.0)

Stream/Segment	Land Use Categories - in units of acres (percent)																
	Bare Rock/Sand/Clay	Deciduous Forest	Emergent Herbaceous Wetlands	Evergreen Forest	High Intensity Commercial/Industrial/Transportation	Low Intensity Commercial/Industrial/Transportation	High Intensity Residential	Low Intensity Residential	Mixed Forest	Open Water	Other Grasses Urban/Recreational	Pasture/Hay	Quarries/Strip Mines/Gravel Pits	Row Crops	Transitional	Woody Wetlands	Unclassified
Doless Creek (Headwaters to Doolittle Creek)	0 (0.0)	97 (9.4)	0 (0.0)	102 (9.9)	199 (19.3)	0 (0.0)	74 (7.2)	351 (34.1)	103 (10.0)	1 (0.1)	102 (9.9)	0 (0.0)	0 (0.0)	1 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)
Doolittle Creek (Headwaters to South River)	2 (0.1)	437 (12.1)	0 (0.0)	423 (11.7)	179 (4.9)	0 (0.0)	220 (6.1)	1659 (45.9)	438 (12.1)	24 (0.7)	233 (6.4)	2 (0.1)	0 (0.0)	0 (0.0)	1 (0.0)	0 (0.0)	0 (0.0)
Falling Creek (Little Falling Creek to Ocmulgee River)	TBD	TBD	TBD	TBD	TBD	0 (0.0)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0 (0.0)
Honey Creek (Headwaters to South River)	0 (0.0)	4117 (22.8)	3 (0.0)	4615 (25.5)	355 (2.0)	0 (0.0)	136 (0.8)	1031 (5.7)	4218 (23.3)	93 (0.5)	331 (1.8)	1676 (9.3)	419 (2.3)	799 (4.4)	116 (0.6)	160 (0.9)	0 (0.0)
Hopkins Creek (Headwaters to Alcovy River)	0 (0.0)	1398 (45.2)	0 (0.0)	425 (13.7)	68 (2.2)	0 (0.0)	23 (0.7)	102 (3.3)	561 (18.1)	4 (0.1)	30 (1.0)	345 (11.1)	0 (0.0)	94 (3.0)	45 (1.5)	0 (0.0)	0 (0.0)
House Creek (Ball Creek to Little House Creek)	TBD	TBD	TBD	TBD	TBD	0 (0.0)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0 (0.0)

Stream/Segment	Land Use Categories - in units of acres (percent)																
	Bare Rock/Sand/Clay	**Deciduous Forest**	**Emergent Herbaceous Wetlands**	**Evergreen Forest**	**High Intensity Commercial/Industrial/Transportation**	**Low Intensity Commercial/Industrial/Transportation**	**High Intensity Residential**	**Low Intensity Residential**	**Mixed Forest**	**Open Water**	**Other Grasses Urban/Recreational**	**Pasture/Hay**	**Quarries/Strip Mines/Gravel Pits**	**Row Crops**	**Transitional**	**Woody Wetlands**	**Unclassified**
Intrenchment Creek (Headwaters to South River)	0 (0.0)	1107 (15.0)	0 (0.0)	297 (4.0)	1467 (19.9)	0 (0.0)	1103 (14.9)	2316 (31.4)	554 (7.5)	7 (0.1)	444 (6.0)	3 (0.0)	0 (0.0)	12 (0.2)	76 (1.0)	0 (0.0)	0 (0.0)
Jacks Creek (Headwaters to Yellow River)	0 (0.0)	549 (16.6)	0 (0.0)	399 (12.1)	98 (2.3)	0 (0.0)	200 (6.1)	1076 (32.6)	709 (21.5)	2 (0.1)	267 (8.1)	3 (0.1)	0 (0.0)	2 (0.1)	1 (0.0)	0 (0.0)	0 (0.0)
Jackson Creek (Gwinnett County)	0 (0.0)	1936 (14.1)	0 (0.0)	2138 (15.5)	670 (4.9)	0 (0.0)	943 (6.9)	4155 (30.2)	3080 (22.4)	35 (0.3)	461 (3.4)	49 (0.4)	0 (0.0)	133 (1.0)	157 (1.1)	0 (0.0)	0 (0.0)
Little Haynes Creek (Hwy 20 to Big Haynes Creek)	0 (0.0)	5666 (33.3)	9 (0.1)	3092 (18.2)	213 (1.3)	0 (0.0)	29 (0.2)	129 (0.8)	4032 (23.7)	69 (0.4)	119 (0.7)	2284 (13.4)	0 (0.0)	937 (5.5)	8 (0.1)	411 (2.4)	0 (0.0)
Little Stone Mountain Creek (Headwaters to Stone Mountain Lake)	0 (0.0)	352 (17.7)	0 (0.0)	489 (24.6)	32 (1.6)	0 (0.0)	10 (0.5)	363 (18.2)	690 (34.6)	6 (0.3)	40 (2.0)	3 (0.2)	0 (0.0)	7 (0.4)	0 (0.0)	0 (0.0)	0 (0.0)
Little Suwanee Creek (Tributary to Yellow River)	0 (0.0)	1611 (29.3)	33 (0.6)	681 (12.4)	310 (5.6)	0 (0.0)	79 (1.4)	649 (11.8)	1308 (23.8)	91 (1.7)	207 (3.8)	99 (1.8)	0 (0.0)	68 (1.2)	1 (0.0)	357 (6.5)	0 (0.0)

Stream/Segment	Land Use Categories - in units of acres (percent)																
	Bare Rock/Sand/Clay	Deciduous Forest	Emergent Herbaceous Wetlands	Evergreen Forest	High Intensity Commercial/Industrial/Transportation	Low Intensity Commercial/Industrial/Transportation	High Intensity Residential	Low Intensity Residential	Mixed Forest	Open Water	Other Grasses Urban/Recreational	Pasture/Hay	Quarries/Strip Mines/Gravel Pits	Row Crops	Transitional	Woody Wetlands	Unclassified
McClain Branch (Headwaters to Honey Creek)	0 (0.0)	575 (20.5)	0 (0.0)	546 (19.4)	101 (3.6)	0 (0.0)	39 (1.4)	472 (16.8)	491 (17.5)	5 (0.2)	159 (5.7)	216 (7.7)	0 (0.0)	159 (5.7)	46 (1.6)	0 (0.0)	0 (0.0)
No Business Creek (Headwaters to Norris Lake)	0 (0.0)	2410 (26.1)	0 (0.0)	1620 (17.5)	248 (2.7)	0 (0.0)	187 (2.0)	929 (10.1)	2348 (25.4)	112 (1.2)	265 (2.9)	748 (8.1)	0 (0.0)	314 (3.4)	53 (0.6)	0 (0.0)	0 (0.0)
North Branch South River (Atlanta)	1 (0.0)	580 (15.2)	0 (0.0)	52 (1.4)	928 (24.3)	0 (0.0)	587 (15.4)	1305 (34.2)	195 (5.1)	8 (0.2)	121 (3.2)	3 (0.1)	0 (0.0)	34 (0.9)	2 (0.1)	0 (0.0)	0 (0.0)
Ocmulgee River (Beaverdam Creek to Walnut Creek)	TBD	TBD	TBD	TBD	TBD	0 (0.0)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0 (0.0)
Ocmulgee River (Sandy Run Creek to Big Indian Creek)	TBD	TBD	TBD	TBD	TBD	0 (0.0)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0 (0.0)
Ocmulgee River (Tobesofkee Creek to Echeconnee Creek)	TBD	TBD	TBD	TBD	TBD	0 (0.0)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0 (0.0)

Stream/Segment	**Land Use Categories - in units of acres (percent)**																
	Bare Rock/Sand/Clay	**Deciduous Forest**	**Emergent Herbaceous Wetlands**	**Evergreen Forest**	**High Intensity Commercial/Industrial/Transportation**	**Low Intensity Commercial/Industrial/Transportation**	**High Intensity Residential**	**Low Intensity Residential**	**Mixed Forest**	**Open Water**	**Other Grasses Urban/Recreational**	**Pasture/Hay**	**Quarries/Strip Mines/Gravel Pits**	**Row Crops**	**Transitional**	**Woody Wetlands**	**Unclassified**
Pew Creek (Gwinnett County)	0 (0.0)	3823 (19.8)	16 (0.1)	2663 (13.8)	1377 (7.2)	0 (0.0)	779 (4.0)	4487 (23.3)	4063 (21.1)	111 (0.6)	1301 (6.8)	326 (1.7)	0 (0.0)	72 (0.4)	161 (0.8)	87 (0.5)	0 (0.0)
Rocky Creek (1 mile u/s Rocky Creek Road to Tobesofkee Creek)	TBD	TBD	TBD	TBD	TBD	0 (0.0)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0 (0.0)
Shetley Creek (Headwaters to Bromolow Creek)	0 (0.0)	125 (15.2)	0 (0.0)	76 (9.2)	86 (10.5)	0 (0.0)	38 (4.6)	288 (35.0)	158 (19.2)	0 (0.0)	51 (6.2)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.1)	0 (0.0)	0 (0.0)
Shoal Creek (Headwaters to Alcovy River)	0 (0.0)	1698 (31.8)	0 (0.0)	756 (14.2)	201 (3.8)	0 (0.0)	184 (3.5)	571 (10.7)	1284 (24.1)	27 (0.5)	155 (2.9)	381 (7.1)	0 (0.0)	77 (1.4)	0 (0.0)	0 (0.0)	0 (0.0)
Shoal Creek (Headwaters to South River)	0 (0.0)	707 (11.3)	0 (0.0)	880 (14.1)	272 (4.4)	0 (0.0)	479 (7.7)	2951 (47.3)	681 (10.9)	10 (0.2)	231 (3.7)	8 (0.1)	0 (0.0)	14 (0.2)	4 (0.1)	0 (0.0)	0 (0.0)
Snapfinger Creek (Dekalb County)	0 (0.0)	3699 (15.0)	0 (0.0)	3695 (14.9)	1850 (7.5)	0 (0.0)	1709 (6.9)	9714 (39.3)	3103 (12.5)	98 (0.4)	693 (2.8)	7 (0.0)	0 (0.0)	41 (0.2)	130 (0.5)	1 (0.0)	0 (0.0)

Stream/Segment	Land Use Categories - in units of acres (percent)																
	Bare Rock/Sand/Clay	Deciduous Forest	Emergent Herbaceous Wetlands	Evergreen Forest	High Intensity Commercial/Industrial/Transportation	Low Intensity Commercial/Industrial/Transportation	High Intensity Residential	Low Intensity Residential	Mixed Forest	Open Water	Other Grasses Urban/Recreational	Pasture/Hay	Quarries/Strip Mines/Gravel Pits	Row Crops	Transitional	Woody Wetlands	Unclassified
Snapping Shoals Creek (Almand Branch to South River)	0 (0.0)	6726 (26.7)	36 (0.1)	4216 (16.7)	1326 (5.3)	0 (0.0)	413 (1.6)	1884 (7.5)	3809 (15.1)	135 (0.5)	662 (2.6)	3012 (11.9)	0 (0.0)	1742 (6.9)	126 (0.5)	1130 (4.5)	0 (0.0)
South River (Atlanta to Flakes Mill Road)	3 (0.0)	11467 (17.9)	0 (0.0)	6838 (10.7)	7902 (12.4)	0 (0.0)	5025 (7.9)	20335 (31.8)	8765 (13.7)	121 (0.2)	2337 (3.7)	204 (0.3)	0 (0.0)	348 (0.5)	563 (0.9)	0 (0.0)	0 (0.0)
South River (Flakes Mill Road to Pole Bridge Creek)	2 (0.0)	8204 (21.1)	10 (0.0)	6470 (16.6)	2094 (5.4)	0 (0.0)	1818 (4.7)	10993 (28.2)	6741 (17.3)	183 (0.5)	847 (2.2)	484 (1.2)	0 (0.0)	346 (0.9)	464 (1.2)	284 (0.7)	0 (0.0)
South River (Hwy 20 to Snapping Shoals Creek)	14 (0.0)	54403 (28.6)	223 (0.1)	34254 (18.0)	6117 (3.2)	0 (0.0)	1878 (1.0)	10583 (5.6)	35744 (18.8)	2620 (1.4)	2598 (1.4)	24057 (12.6)	0 (0.0)	12310 (6.5)	509 (0.3)	4701 (2.5)	0 (0.0)
South River (Pole Bridge Creek to Hwy 20)	0 (0.0)	15429 (27.4)	3 (0.0)	12476 (22.1)	1087 (1.9)	0 (0.0)	608 (1.1)	4523 (8.0)	12770 (22.7)	470 (0.8)	829 (1.5)	4777 (8.5)	602 (1.1)	2151 (3.8)	397 (0.7)	246 (0.4)	0 (0.0)
South River (Snapping Shoals to Jackson Lake)	0 (0.0)	13686 (45.4)	15 (0.1)	5811 (19.3)	123 (0.4)	0 (0.0)	9 (0.0)	136 (0.5)	5015 (16.6)	698 (2.3)	36 (0.1)	3102 (10.3)	0 (0.0)	1284 (4.3)	28 (0.1)	201 (0.7)	0 (0.0)

Stream/Segment	Land Use Categories - in units of acres (percent)																
	Bare Rock/Sand/Clay	**Deciduous Forest**	**Emergent Herbaceous Wetlands**	**Evergreen Forest**	**High Intensity Commercial/Industrial/Transportation**	**Low Intensity Commercial/Industrial/Transportation**	**High Intensity Residential**	**Low Intensity Residential**	**Mixed Forest**	**Open Water**	**Other Grasses Urban/Recreational**	**Pasture/Hay**	**Quarries/Strip Mines/Gravel Pits**	**Row Crops**	**Transitional**	**Woody Wetlands**	**Unclassified**
Stone Mountain Creek (Headwaters to Stone Mountain Lake)	0 (0.0)	582 (22.4)	0 (0.0)	457 (17.6)	363 (14.0)	0 (0.0)	81 (3.1)	334 (12.9)	714 (27.5)	5 (0.2)	45 (1.7)	0 (0.0)	0 (0.0)	0 (0.0)	14 (0.5)	0 (0.0)	0 (0.0)
Sugar Creek (U/s Memorial Drive to South River)	0 (0.0)	826 (14.0)	0 (0.0)	455 (7.7)	377 (6.4)	0 (0.0)	554 (9.4)	2769 (47.1)	676 (11.5)	2 (0.0)	218 (3.7)	1 (0.0)	0 (0.0)	1 (0.0)	4 (0.1)	0 (0.0)	0 (0.0)
Sweetwater Creek (Lee Daniel Creek to Yellow River)	0 (0.0)	5876 (18.7)	188 (0.6)	4371 (13.9)	3420 (10.9)	0 (0.0)	1872 (6.0)	6162 (19.6)	6192 (19.7)	258 (0.8)	1146 (3.7)	827 (2.6)	0 (0.0)	272 (0.9)	356 (1.1)	496 (1.6)	0 (0.0)
Swift Creek (Headwaters to Yellow River)	0 (0.0)	1320 (26.0)	0 (0.0)	1192 (23.5)	111 (2.2)	0 (0.0)	11 (0.2)	188 (3.7)	1213 (23.4)	95 (1.9)	48 (1.0)	108 (2.1)	572 (11.3)	188 (3.7)	31 (0.6)	0 (0.0)	0 (0.0)
Tobesofkee Creek (Cole Creek to Todd Creek)	TBD	TBD	TBD	TBD	TBD	0 (0.0)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0 (0.0)
Tobesofkee Creek (Lake Tobesofkee to Rocky Creek)	TBD	TBD	TBD	TBD	TBD	0 (0.0)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0 (0.0)

Stream/Segment	Land Use Categories - in units of acres (percent)																
	Bare Rock/Sand/Clay	Deciduous Forest	Emergent Herbaceous Wetlands	Evergreen Forest	High Intensity Commercial/Industrial/Transportation	Low Intensity Commercial/Industrial/Transportation	High Intensity Residential	Low Intensity Residential	Mixed Forest	Open Water	Other Grasses Urban/Recreational	Pasture/Hay	Quarries/Strip Mines/Gravel Pits	Row Crops	Transitional	Woody Wetlands	Unclassified
Town Branch (D/S Jackson South WPCP to Aboothlacoosta Creek)	TBD	TBD	TBD	TBD	TBD	0 (0.0)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0 (0.0)
Turkey Creek (Headwaters to Yellow River)	0 (0.0)	262 (15.6)	0 (0.0)	298 (17.7)	30 (1.8)	0 (0.0)	75 (4.5)	505 (30.0)	365 (21.7)	2 (0.1)	81 (4.8)	36 (2.1)	0 (0.0)	15 (0.9)	14 (0.8)	0 (0.0)	0 (0.0)
Turnpike Creek (Hwy 280 to Sugar Creek)	TBD	TBD	TBD	TBD	TBD	0 (0.0)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0 (0.0)
Tussahaw Creek (Wolf Creek to Lake Jackson)	TBD	TBD	TBD	TBD	TBD	0 (0.0)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0 (0.0)
Walnut Creek (Headwaters to Ocmulgee River)	TBD	TBD	TBD	TBD	TBD	0 (0.0)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0 (0.0)
Watson Creek (Headwaters to Yellow River)	0 (0.0)	285 (11.2)	0 (0.0)	548 (21.6)	90 (3.6)	0 (0.0)	96 (3.8)	622 (24.5)	662 (26.1)	1 (0.0)	163 (6.4)	40 (1.6)	0 (0.0)	14 (0.6)	17 (0.7)	0 (0.0)	0 (0.0)

Stream/Segment	Land Use Categories - in units of acres (percent)																
	Bare Rock/Sand/Clay	Deciduous Forest	Emergent Herbaceous Wetlands	Evergreen Forest	High Intensity Commercial/Industrial/Transportation	Low Intensity Commercial/Industrial/Transportation	High Intensity Residential	Low Intensity Residential	Mixed Forest	Open Water	Other Grasses Urban/Recreational	Pasture/Hay	Quarries/Strip Mines/Gravel Pits	Row Crops	Transitional	Woody Wetlands	Unclassified
Wise Creek (Headwaters to Kinnard Creek)	TBD	TBD	TBD	TBD	TBD	0 (0.0)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0 (0.0)
Yellow River (Big Haynes Creek to Jackson Lake)	4 (0.0)	15111 (24.9)	826 (0.2)	81472 (17.6)	21647 (4.7)	0 (0.0)	12124 (2.6)	58639 (12.7)	99123 (21.4)	4222 (0.9)	13726 (3.0)	31688 (6.9)	1886 (0.4)	13078 (2.8)	2666 (0.6)	6216 (1.3)	0 (0.0)
Yellow River (Hwy 124 to Big Haynes Creek)	2 (0.0)	37697 (22.7)	284 (0.2)	28328 (17.1)	9554 (5.8)	0 (0.0)	5555 (3.3)	28714 (17.3)	36553 (22.0)	1705 (1.0)	6104 (3.7)	4701 (2.8)	1224 (0.7)	2608 (1.6)	994 (0.6)	2081 (1.3)	0 (0.0)
Yellow River (Sweetwater Creek to Hwy 124)	0 (0.0)	20569 (19.8)	237 (0.2)	15442 (14.9)	7189 (6.9)	0 (0.0)	4780 (4.6)	23217 (22.4)	22349 (21.6)	654 (0.6)	4747 (4.6)	1950 (1.9)	0 (0.0)	794 (0.8)	725 (0.7)	999 (1.0)	0 (0.0)
Yellow Water Creek (1 mile d/s Stark Road)	TBD	TBD	TBD	TBD	TBD	0 (0.0)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0 (0.0)
Lake Jackson (Newton, Butts, and Jasper Counties)	TBD	TBD	TBD	TBD	TBD	0 (0.0)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0 (0.0)

TBD = To Be Determined

Table 2 Waterbodies Listed for Fecal Coliform Bacteria in the Ocmulgee River Basin

Stream Name	Segment Description	Segment Length (miles)	Designated Use Classification	Partially Supporting Designated Uses	Not Supporting Designated Uses
Alcovy River	Cedar Creek to Bay Creek	4	Fishing/ Drinking Water		X
Alligator Creek	Batson Creek to Lime Sink Creek	12	Fishing		X
Almand Branch	Tanyard Branch to Snapping Shoals	5	Fishing		X
Bay Creek	Headwaters to Beaver Creek	9	Fishing		X
Beaver Ruin Creek	Gwinnett County	8	Fishing	X	
Big Cotton Indian Creek	Panther Creek to Brush Creek	5	Fishing		X
Big Flat Creek	Headwaters to Flat Creek	13	Fishing		X
Big Haynes Creek	Brushy Creek to Little Panther Creek	2	Drinking Water	X	
Big Haynes Creek	Headwaters to Brushy Creek	9	Fishing/ Drinking Water	X	
Big Haynes Creek	Little Haynes Creek to Yellow River	5	Drinking Water	X	
Big Indian Creek	Mossy Creek to Ocmulgee River	7	Fishing	X	
Big Sandy Creek	Aboothlacoosta Creek to Ocmulgee River	10	Fishing		X
Bromolow Creek	Headwaters to Beaver Ruin Creek	5	Fishing	X	
Cabin Creek	Headwaters Griffin to Towaliga River	16	Fishing		X
Camp Creek	Headwaters to Jackson Creek	6	Fishing		X
Cedar Creek	Headwaters to Alcovy River	4	Fishing	X	
Cobbs Creek	Headwaters to Shoal Creek	7	Fishing		X
Conley Creek	Headwaters to South River	9	Fishing		X
Doless Creek	Headwaters to Doolittle Creek	2	Fishing	X	
Doolittle Creek	Headwaters to South River	5	Fishing		X
Falling Creek	Little Falling Creek to Ocmulgee River	9	Fishing		X
Honey Creek	Headwaters to South River	13	Fishing		X
Hopkins Creek	Headwaters to Alcovy River	4	Fishing		X
House Creek	Ball Creek to Little House Creek	8	Fishing		X
Intrenchment Creek	Headwaters to South River	6	Fishing		X
Jacks Creek	Headwaters to Yellow River	4	Fishing		X
Jackson Creek	Gwinnett County	7	Fishing	X	
Little Haynes Creek	Hwy 20 to Big Haynes Creek	11	Fishing		X

Stream Name	Segment Description	Segment Length (miles)	Designated Use Classification	Partially Supporting Designated Uses	Not Supporting Designated Uses
Little Stone Mountain Creek	Headwaters to Stone Mountain Lake	3	Fishing		X
Little Suwanee Creek	Tributary to Yellow River	2	Fishing		X
McClain Branch	Headwaters to Honey Creek	2	Fishing		X
No Business Creek	Headwaters to Norris Lake	6	Fishing		X
North Branch South River	Atlanta	3	Fishing	X	
Ocmulgee River	Beaverdam Creek to Walnut Creek	10	Fishing/ Drinking Water	X	
Ocmulgee River	Sandy Run Creek to Big Indian Creek	23	Fishing	X	
Ocmulgee River	Tobesofkee Creek to Echeconnee Creek	7	Fishing	X	
Pew Creek	Gwinnett County	4	Fishing	X	
Rocky Creek	1 mile u/s Rocky Creek Road to Tobesofkee Creek	5	Fishing	X	
Shetley Creek	Headwaters to Bromolow Creek	2	Fishing		X
Shoal Creek	Headwaters to Alcovy River	5	Fishing		X
Shoal Creek	Headwaters to South River	7	Fishing		X
Snapfinger Creek	Dekalb County	18	Fishing		X
Snapping Shoals Creek	Almand Branch to South River	10	Fishing		X
South River	Atlanta to Flakes Mill Road	16	Fishing		X
South River	Flakes Mill Road to Pole Bridge Creek	9	Fishing		X
South River	Hwy 20 to Snapping Shoals Creek	11	Fishing	X	
South River	Pole Bridge Creek to Hwy 20	15	Fishing		X
South River	Snapping Shoals to Jackson Lake	7	Fishing	X	
Stone Mountain Creek	Headwaters to Stone Mountain Lake	4	Fishing		X
Sugar Creek	U/s Memorial Drive to South River	6	Fishing		X
Sweetwater Creek	Lee Daniel Creek to Yellow River	6	Fishing		X
Swift Creek	Headwaters to Yellow River	5	Fishing		X
Tobesofkee Creek	Cole Creek to Todd Creek	8	Fishing		X
Tobesofkee Creek	Lake Tobesofkee to Rocky Creek	10	Fishing	X	
Town Branch	D/S Jackson South WPCP to Aboothlacoosta Creek	3	Fishing		X
Turkey Creek	Headwaters to Yellow River	4	Fishing		X
Turnpike Creek	Hwy 280 to Sugar Creek	24	Fishing		X
Tussahaw Creek	Wolf Creek to Lake Jackson	6	Fishing		X

Stream Name	Segment Description	Segment Length (miles)	Designated Use Classification	Partially Supporting Designated Uses	Not Supporting Designated Uses
Walnut Creek	Headwaters to Ocmulgee River	20	Fishing		X
Watson Creek	Headwaters to Yellow River	3	Fishing		X
Wise Creek	Headwaters to Ocmulgee River	6	Fishing		X
Yellow River	Big Haynes Creek to Jackson Lake	25	Fishing/ Drinking Water		X
Yellow River	Hwy 124 to Big Haynes Creek	16	Drinking Water	X	
Yellow River	Sweetwater Creek to Hwy 124	16	Fishing		X
Yellow Water Creek	1 mile d/s Stark Road	7	Fishing		X
Lake Jackson	Newton, Butts, and Jasper Counties	N/A*	Recreation		X

*Affected area equals 650 acres

Table 3 1999 Water Quality Monitoring Stations

Stream Name	Segment Description	USGS Monitoring Station No.	Monitoring Station Description
Alcovy River	Cedar Creek to Bay Creek	02208182	Alcovy River at State Road 81 near Loganville, Georgia
Alligator Creek	Batson Creek to Lime Sink Creek	02216028	Alligator Creek at State Road 46 near McRae, Georgia
Almand Branch	Tanyard Branch to Snapping Shoals	02204748	Almand Branch at State Road 138 near Conyers, Georgia
Bay Creek	Headwaters to Beaver Creek	02214472	Bay Creek at State Road 96 near Fort Valley, Georgia
Beaver Ruin Creek	Gwinnett County	No station	No station
Big Cotton Indian Creek	Panther Creek to Brush Creek	02204222	Big Cotton Indian Creek at Stockbridge Road near Stockbridge, Georgia
Big Flat Creek	Headwaters to Flat Creek	02208420	Big Flat Creek at U.S. Highway 78 near Loganville, Georgia
Big Haynes Creek	Brushy Creek to Little Panther Creek	02207412	Big Haynes Creek at State Road 20 near Conyers, Georgia
Big Haynes Creek	Headwaters to Brushy Creek	NA	NA
Big Haynes Creek	Little Haynes Creek to Yellow River	NA	NA
Big Indian Creek	Mossy Creek to Ocmulgee River	02214835	Big Indian Creek at State Road 247 near Kathleen, Georgia
Big Sandy Creek	Aboothlacoosta Creek to Ocmulgee River	02211199	Big Sandy Creek at State Road 87 near Sandy, Georgia
Bromolow Creek	Headwaters to Beaver Ruin Creek	02206030	Bromolow Creek at Shackelford Road near Norcross, Georgia
Cabin Creek	Headwaters Griffin to Towaliga River	02211380	Cabin Creek at State Road 16 near Griffin, Georgia
Camp Creek	Headwaters to Jackson Creek	02206235	Camp Creek at Killian Hill Road near Lilburn, Georgia
Cedar Creek	Headwaters to Alcovy River	02208180	Cedar Creek at Luke Edwards Road near Dacula, Georgia
Cobbs Creek	Headwaters to Shoal Creek	02203873	Cobbs Creek at Rainbow Drive near Decatur, Georgia
Conley Creek	Headwaters to South River	02203899	Conley Creek at River Road near Panthersville, Georgia
Doless Creek	Headwaters to Doolittle Creek	04108701*	Doless Creek at Flat Shoals Road near Decatur, Georgia
Doolittle Creek	Headwaters to South River	02203831	Doolittle Creek at Flat Shoals Road near Decatur, Georgia
Falling Creek	Little Falling Creek to Ocmulgee River	02212600	Falling Creek - FAS 1640 Near East Juliet
Honey Creek	Headwaters to South River	02204130	Honey Creek at State Road 212 near Conyers, Georgia
Hopkins Creek	Headwaters to Alcovy River	02208085	Hopkins Creek at Stanley Road near Dacula, Georgia
House Creek	Ball Creek to Little House Creek	02215276	House Creek at Sea Graves Road near Forest Glen, Georgia

Stream Name	Segment Description	USGS Monitoring Station No.	Monitoring Station Description
Intrenchment Creek	Headwaters to South River	02203700	Intrenchment Creek at Bailey Street near Atlanta, Georgia
Jacks Creek	Headwaters to Yellow River	02207060	Jacks Creek at State Road 264 near Centerville, Georgia
Jackson Creek	Gwinnett County	02206300	Jackson Creek at Arcado Road near Luxomni, Georgia
Little Haynes Creek	Hwy 20 to Big Haynes Creek	02207430	Little Haynes Creek at State Road 138 near Conyers, Georgia
Little Stone Mountain Creek	Headwaters to Stone Mountain Lake	02207135	Little Stone Mountain Creek at Old Stone Mountain Road near Stone Mountain, Georgia
Little Suwanee Creek	Tributary to Yellow River	02205130	Little Suwanee Creek at Russell Road near Lawrenceville, Georgia
McClain Branch	Headwaters to Honey Creek	02204128	McClain Branch at Troupe Smith Road near Conyers, Georgia
No Business Creek	Headwaters to Norris Lake	02207185	No Business Creek at Lee Road near Snellville, Georgia
North Branch South River	Atlanta	No station	No station
Ocmulgee River	Beaverdam Creek to Walnut Creek	02212950	Ocmulgee River - Macon Water Intake
Ocmulgee River	Sandy Run Creek to Big Indian Creek	02214265	Ocmulgee River - Georgia Highway 96
Ocmulgee River	Tobesofkee Creek to Echeconnee Creek	02213700	Ocmulgee River - 6.0 Miles Downstream from Tobesofkee Creek
Pew Creek	Gwinnett County	02205522	Pew Creek at Patterson Road near Lawrenceville, Georgia
Rocky Creek	1 mile u/s Rocky Creek Road to Tobesofkee Creek	02213660 02213675	Rocky Creek at Log Cabin Drive near Macon, Georgia and Rocky Creek at Rocky Creek Road near Macon, Georiga
Shetley Creek	Headwaters to Bromolow Creek	02206000	Shetley Creek at Old Norcross Road near Norcross, Georgia
Shoal Creek	Headwaters to Alcovy River	02208140	Shoal Creek at Bramlett Shoals Road near Lawrenceville, Georgia
Shoal Creek	Headwaters to South River	02203850	Shoal Creek at Rainbow Drive near Atlanta, Georgia
Snapfinger Creek	Dekalb County	02203961	Snapfinger Creek at State Road 155 near Panthersville, Georgia
Snapping Shoals Creek	Almand Branch to South River	02204776	Snapping Shoals Creek at Bethany Road near Oak Hill, Georgia
South River	Atlanta to Flakes Mill Road	02203630 02203800	South River at Jonesboro Road at Atlanta, Georgia and South River at Bouldercrest Road
South River	Flakes Mill Road to Pole Bridge Creek	02203965	South River - Georgia Highway 155
South River	Hwy 20 to Snapping Shoals Creek	02204520	South River - Georgia Highway 81 at Snapping Shoals
South River	Pole Bridge Creek to Hwy 20	02204070 02204149	South River - Klondike Road and South River at State Road 20 near Kelleytown, Georgia
South River	Snapping Shoals to Jackson Lake	02204810	South River at Island Shoals Road near Snapping Shoals, Georgia

Stream Name	Segment Description	USGS Monitoring Station No.	Monitoring Station Description
Stone Mountain Creek	Headwaters to Stone Mountain Lake	02207130	Stone Mountain Creek at Silver Hill Road near Stone Mountain, Georgia
Sugar Creek	U/s Memorial Drive to South River	02203820	Sugar Creek at Clifton Church Road near Atlanta, Georgia
Sweetwater Creek	Lee Daniel Creek to Yellow River	02206100	Sweetwater Creek at U.S. Highway 29 near Luxomni, Georgia
Swift Creek	Headwaters to Yellow River	02207200	Swift Creek at Conyers Street near Lithonia, Georgia
Tobesofkee Creek	Cole Creek to Todd Creek	02213300	Tobesofkee Creek at Parks Road near Forsyth, Georgia
Tobesofkee Creek	Lake Tobesofkee to Rocky Creek	02213560	Tobesofkee Creek - U.S. Highways 41 and 129
Town Branch	D/S Jackson S. WPCP to Aboothlacoosta Cr.	02211110	Town Branch at James Moore Drive (County Road 262) near Jackson, Georgia
Turkey Creek	Headwaters to Yellow River	02206448	Turkey Creek at Martin Nash Road near Snellville, Georgia
Turnpike Creek	Hwy 280 to Sugar Creek	02216187	Turnpike Creek at Cedar Park Dowdyville Road near Lumber City, Georgia
Tussahaw Creek	Wolf Creek to Lake Jackson	02209750	Tussahaw Creek at Fincherville Road near Stark, Georgia
Walnut Creek	Headwaters to Ocmulgee River	02213055 02213110	Walnut Creek at McKay Road (County Road 11) near Clinton, Georgia and Walnut Creek at US Highway 80 near Macon, Georgia
Watson Creek	Headwaters to Yellow River	02206470	Watson Creek at High Point Road near Snellville, Georgia
Wise Creek	Headwaters to Kinnard Creek	02210998	Wise Creek at Concord Road (County Road 141) near Monticello, Georgia
Yellow River	Big Haynes Creek to Jackson Lake	02208005	Yellow River - Georgia Highway 212
Yellow River	Hwy 124 to Big Haynes Creek	02207300	Yellow River - Conyers Water Intake
Yellow River	Sweetwater Creek to Hwy 124	02206500	Yellow River - Killian Hill Road
Yellow Water Creek	1 mile d/s Stark Road	02210780	Yellow Water Creek at State Road 16 near Jackson, Georgia
Lake Jackson	Newton, Butts, and Jasper Counties	04350051*	Lake Jackson downstream from Alcovy River confluence

*Georgia monitoring station number; no corresponding USGS station

Table 4 CY 1999 Water Quality Monitoring Data

Stream/Segment	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)
Alcovy River (Cedar Creek to Bay Creek)	02/12/1999 02/16/1999 02/22/1999 03/05/1999	47	04/08/1999 04/13/1999 04/20/1999 04/29/1999	74	06/10/1999 06/17/1999 06/24/1999 07/08/1999	384	09/09/1999 09/23/1999 09/30/1999 10/07/1999	359
Alligator Creek (Batson Creek to Lime Sink Creek)	04/06/1999 04/15/1999 04/22/1999 04/28/1999	756	05/20/1999 05/27/1999 06/10/1999 06/17/1999	658				
Almand Branch (Tanyard Branch to Snapping Shoals)	02/11/1999 02/17/1999 02/23/1999 03/03/1999	110	04/07/1999 04/12/1999 04/19/1999 04/28/1999	126	06/09/1999 06/16/1999 06/23/1999 07/07/1999	1037	09/08/1999 09/22/1999 09/29/1999 10/06/1999	373
Bay Creek (Headwaters to Beaver Creek)	01/19/1999 01/27/1999 02/02/1999 02/18/1999	26424	04/01/1999 04/14/1999 04/21/1999 04/28/1999	2929	06/23/1999 06/30/1999 07/14/1999 07/21/1999	21218	09/22/1999 09/29/1999 10/05/1999 10/20/1999	2480
Beaver Ruin Creek (Gwinnett County)	NA	NA	NA	NA	NA	NA	NA	NA
Big Cotton Indian Cr. (Panther Creek to Brush Creek)	02/11/1999 02/17/1999 02/23/1999 03/03/1999	234	04/07/1999 04/12/1999 04/19/1999 04/28/1999	435	06/09/1999 06/16/1999 06/23/1999 07/07/1999	492	09/08/1999 09/22/1999 09/29/1999 10/06/1999	1826
Big Flat Creek (Headwaters to Flat Creek)	02/12/1999 02/16/1999 02/22/1999	130	04/08/1999 04/13/1999 04/20/1999 04/29/1999	1797	06/10/1999 06/17/1999 06/24/1999 07/08/1999	1303	09/09/1999 09/23/1999 09/30/1999 10/07/1999	761
Big Haynes Creek (Brushy Creek to Little Panther Creek)	2/12/1999 2/16/1999 2/22/1999 3/05/1999	185	6/10/1999 6/17/1999 6/24/1999 07/08/1999	306	NA	NA	NA	NA
Big Haynes Creek (Headwaters to Brushy Creek)	NA	NA	NA	NA	NA	NA	NA	NA

Stream/Segment	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)
Big Haynes Creek (Little Haynes Creek to Yellow River)	NA	NA	NA	NA	NA	NA	NA	NA
Big Indian Creek (Mossy Creek to Ocmulgee River)	01/19/1999 01/27/1999 02/02/1999 02/18/1999	194	04/01/1999 04/14/1999 04/21/1999 04/28/1999	60	06/23/1999 06/30/1999 07/14/1999 07/21/1999	341	09/22/1999 09/29/1999 10/05/1999 10/20/1999	83
Big Sandy Creek (Aboothlacoosta Creek to Ocmulgee River)	01/21/1999 01/26/1999 02/04/1999 04/16/1999	196	03/30/1999 04/13/1999 04/20/1999 04/27/1999	58	06/22/1999 06/29/1999 07/13/1999 07/20/1999	332	09/21/1999 29/28/1999 10/06/1999 10/19/1999	258
Bromolow Creek (Headwaters to Beaver Ruin Creek)	03/09/1999 03/15/1999 03/18/1999 03/24/1999	55	05/03/1999 05/12/1999 05/18/1999 06/02/1999	149	07/06/1999 07/19/1999 07/22/1999 07/28/1999	1671	11/01/1999 11/04/1999 11/15/1999 11/18/1999	264
Cabin Creek (Headwaters Griffin to Towaliga River)	02/25/1999 03/01/1999 03/08/1999 03/11/1999	133	04/06/1999 04/14/1999 04/21/1999 04/27/1999	305	06/08/1999 06/15/1999 06/22/1999 07/06/1999	656	09/07/1999 09/21/1999 09/28/1999 10/05/1999	982
Camp Creek (Headwaters to Jackson Creek)	03/09/1999 03/15/1999 03/18/1999 03/24/1999	237	03/03/1999 03/12/1999 03/18/1999 06/02/1999	229	07/06/1999 07/19/1999 07/22/1999 07/28/1999	465	11/01/1999 11/04/1999 11/15/1999 11/18/1999	125
Cedar Creek (Headwaters to Alcovy River)	03/09/1999 03/15/1999 03/18/1999 03/24/1999	81	05/03/1999 05/12/1999 05/18/1999 06/02/1999	80	07/06/1999 07/19/1999 07/22/1999 07/28/1999	222	11/01/1999 11/04/1999 11/15/1999 11/18/1999	53
Cobbs Creek (Headwaters to Shoal Creek)	03/10/1999 03/16/1999 03/22/1999 03/25/1999	407	05/04/1999 05/13/1999 05/17/1999 05/19/1999	979	07/07/1999 07/20/1999 07/26/1999 0729/1999	2029	11/02/1999 11/08/1999 11/16/1999 11/22/1999	350
Conley Creek (Headwaters to South River)	03/10/1999 03/16/1999 03/22/1999 03/25/1999	119	05/04/1999 05/13/1999 05/17/1999 05/19/1999	503	07/07/1999 07/20/1999 07/26/1999 07/29/1999	411	11/02/1999 11/08/1999 11/16/1999 11/22/1999	300

Stream/Segment	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)
Doless Creek (Headwaters to Doolittle Creek)	03/10/1999 03/16/1999 03/22/1999 03/25/1999	182	05/04/1999 05/13/1999 05/17/1999 05/19/1999	6901	NA	NA	NA	NA
Doolittle Creek (Headwaters to South River)	07/07/1999 07/20/1999 07/26/1999 07/29/1999	625	11/02/1999 11/08/1999 11/16/1999 11/22/1999	221	NA	NA	NA	NA
Falling Creek (Little Falling Creek to Ocmulgee River)	01/21/1999 01/26/1999 02/04/1999 02/16/1999	153	03/30/1999 04/13/1999 04/20/1999 04/27/1999	114	06/22/1999 06/29/1999 07/13/1999 07/20/1999	223	09/21/1999 09/28/1999 10/06/1999 10/19/1999	241
Honey Creek (Headwaters to South River)	02/25/1999 03/01/1999 03/08/1999 03/11/1999	253	04/06/1999 04/14/1999 04/21/1999 04/27/1999	333	06/08/1999 06/15/1999 06/22/1999 07/06/1999	409	09/07/1999 09/21/1999 09/28/1999 10/05/1999	742
Hopkins Creek (Headwaters to Alcovy River)	03/09/1999 03/15/1999 03/18/1999 03/24/199	79	05/03/1999 05/12/1999 05/18/1999 06/02/1999	288	07/06/1999 07/19/1999 07/22/1999 07/28/1999	259	11/01/1999 11/04/1999 11/15/1999 11/18/1999	39
House Creek (Ball Creek to Little House Creek)	04/06/1999 04/15/1999 04/22/199 04/28/1999	155	07/29/1999 08/12/1999 08/19/1999 08/26/1999	402	NA	NA	NA	NA
Intrenchment Creek (Headwaters to South River)	03/10/1999 03/16/1999 03/22/1999 03/25/1999	114	05/04/1999 05/13/1999 05/17/1999 05/19/1999	915	07/07/1999 07/20/1999 07/26/1999 07/29/1999	2293	11/02/1999 11/08/1999 11/16/1999 11/22/1999	485
Jacks Creek (Headwaters to Yellow River)	03/11/1999 03/17/1999 03/23/1999 04/08/1999	88	05/06/1999 05/17/1999 05/20/1999 06/03/1999	3137	07/08/1999 07/21/1999 07/27/1999 08/02/1999	1218	11/03/1999 11/09/1999 11/17/1999 11/23/1999	401

Stream/Segment	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)
Jackson Creek (Gwinnett County)	03/09/1999 03/15/1999 03/18/1999 03/24/1999	161	05/03/1999 05/12/1999 05/18/1999 06/02/1999	151	07/06/1999 07/19/1999 07/22/1999 07/28/1999	535	11/01/1999 11/04/1999 11/15/1999 11/18/1999	181
Little Haynes Creek (Hwy 20 to Big Haynes Creek)	02/12/1999 02/16/1999 02/22/1999 03/05/1999	70	04/08/1999 04/13/199 04/20/1999 04/29/1999	252	07/10/1999 07/17/1999 07/24/1999 08/08/1999	252	09/09/1999 09/23/1999 09/30/1999 10/07/1999	409
Little Stone Mountain Creek (Headwaters to Stone Mountain Lake)	03/11/1999 03/17/1999 03/23/1999 04/08/1999	105	05/06/1999 05/17/1999 05/20/1999 06/03/1999	708	0708/1999 0721/1999 0727/1999 08/02/1999	446	11/03/1999 11/09/1999 11/17/1999 11/23/1999	292
Little Suwanee Creek (Tributary to Yellow River)	03/09/1999 03/15/1999 03/18/1999 03/24/1999	182	05/03/1999 05/12/1999 05/18/1999 06/02/1999	911	07/06/1999 07/19/1999 07/22/1999 07/28/1999	1451	11/01/1999 11/04/1999 11/15/1999 11/18/1999	500
McClain Branch (Headwaters to Honey Creek)	03/10/1999 03/16/1999 03/22/1999 03/25/1999	759	05/04/1999 05/13/1999 05/17/1999 05/19/1999	374	07/07/1999 07/20/1999 07/26/1999 07/29/1999	633	11/02/1999 11/08/1999 11/16/1999 11/22/1999	548
No Business Creek (Headwaters to Norris Lake)	03/11/1999 03/17/1999 03/23/1999 04/08/1999	82	05/06/1999 05/17/1999 05/20/1999 06/03/1999	349	07/08/1999 07/21/1999 07/27/1999 08/02/1999	224	11/03/1999 11/09/1999 11/17/1999 11/23/1999	72
North Branch South River (Atlanta)	NA	NA	NA	NA	NA	NA	NA	NA
Ocmulgee River (Beaverdam Creek to Walnut Creek)	01/20/1999 01/28/1999 02/03/1999 02/17/1999	123	03/31/1999 04/15/1999 04/22/1999 04/29/1999	34	06/24/1999 07/01/1999 07/15/1999 07/22/1999	203	09/23/1999 09/30/1999 10/07/1999 10/21/1999	51
Ocmulgee River (Sandy Run Creek to Big Indian Creek)	01/19/1999 01/27/1999 02/02/1999 02/18/1999	169	04/01/1999 04/14/1999 04/21/1999 04/28/1999	57	06/23/1999 06/30/1999 07/14/1999 07/21/1999	267	09/22/1999 09/29/1999 10/05/1999 10/20/1999	89

Stream/Segment	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)
Ocmulgee River (Tobesofkee Creek to Echeconnee Creek)	01/20/1999 01/28/1999 02/03/1999 02/17/1999	133	03/31/1999 04/15/1999 04/22/1999 04/29/1999	30	06/24/1999 07/01/1999 07/15/1999 07/22/1999	306	09/23/1999 09/30/1999 10/07/1999 10/21/1999	85
Pew Creek (Gwinnett County)	03/09/1999 03/15/1999 03/18/1999 03/24/1999	55	05/03/1999 05/12/1999 05/18/1999 06/02/1999	149	07/06/1999 07/19/1999 07/22/1999 07/28/1999	557	11/01/1999 11/04/1999 11/15/1999 11/18/1999	289
Rocky Creek (1 mile u/s Rocky Cr. Rd. to Tobesofkee Cr.)	NA	NA	NA	NA	NA	NA	NA	NA
Shetley Creek (Headwaters to Bromolow Creek)	03/09/1999 03/15/1999 03/18/1999 03/24/1999	230	05/03/1999 05/12/1999 05/18/1999 06/02/1999	582	06/06/1999 06/19/1999 06/22/1999 06/28/1999	1955	11/01/1999 11/04/1999 11/15/1999 11/18/1999	719
Shoal Creek (Headwaters to Alcovy River)	03/09/1999 03/15/1999 03/18/1999 03/24/1999	401	05/03/1999 05/12/1999 05/18/1999 06/02/1999	337	07/06/1999 07/19/1999 07/22/1999 07/28/1999	480	11/01/1999 11/04/1999 11/15/1999 11/18/1999	227
Shoal Creek (Headwaters to South River)	03/10/1999 03/16/1999 03/22/1999 03/25/1999	636	05/04/1999 05/13/1999 05/17/1999 05/19/1999	1931	06/07/1999 06/20/1999 06/26/1999 06/29/1999	2929	11/02/1999 11/08/1999 11/16/1999 11/22/1999	5630
Snapfinger Creek (Dekalb County)	02/11/1999 02/17/1999 02/23/1999 03/03/1999	302	04/07/1999 04/12/1999 04/19/1999 04/28/1999	708	06/09/1999 06/16/1999 06/23/1999 07/07/1999	1102	09/08/1999 09/22/1999 09/29/1999 10/06/1999	825
Snapping Shoals Creek (Almand Branch to South River)	03/10/1999 03/16/1999 03/22/1999 03/25/1999	142	05/04/1999 05/13/1999 05/17/1999 05/19/1999	1026	07/07/1999 07/20/1999 07/26/1999 07/29/1999	751	11/08/1999 11/16/1999 11/22/1999 11/29/1999	61
South River (Atlanta to Flakes Mill Road)	02/11/1999 02/17/1999 02/23/1999 03/03/1999	231	04/07/1999 04/12/1999 04/19/1999 04/28/1999	1647	06/09/1999 06/16/1999 06/23/1999 07/07/1999	5438	09/08/1999 09/22/1999 09/29/1999 10/06/1999	4440

Stream/Segment	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)
South River (Flakes Mill Road to Pole Bridge Creek)	02/11/1999 02/17/1999 02/23/1999 03/03/1999	578	04/07/1999 04/12/1999 04/19/1999 04/28/1999	752	06/09/1999 06/16/1999 06/23/1999 07/07/1999	652	09/08/1999 09/22/1999 09/29/1999 10/06/1999	1207
South River (Hwy 20 to Snapping Shoals Creek)	01/07/1999 01/13/1999 01/20/1999 02/04/1999	199	04/06/1999 04/14/1999 04/21/1999 04/27/1999	330	06/08/1999 06/15/1999 06/22/1999 07/06/1999	164	09/07/1999 09/21/1999 09/28/1999 10/05/1999	584
South River (Pole Bridge Creek to Hwy 20)	02/11/1999 02/17/1999 02/23/1999 03/03/1999	152	04/07/1999 04/12/1999 04/19/1999 04/28/1999	416	06/09/1999 06/16/1999 06/23/1999 07/07/1999	345	09/08/1999 09/22/1999 09/29/1999 10/06/1999	1270
South River (Snapping Shoals to Jackson Lake)	01/04/1999 01/21/1999 01/25/1999 02/03/1999	184	05/06/1999 05/11/1999 05/18/1999 06/03/1999	198.4	09/03/1999 09/15/1999 09/22/1999 09/30/1999	411.8	11/19/1999 11/22/1999 12/08/1999 12/15/1999	80.6
Stone Mountain Creek (Headwaters to Stone Mountain Lake)	03/11/1999 03/17/1999 03/23/1999 04/08/1999	63	05/06/1999 05/17/1999 05/20/1999 06/03/1999	373	07/08/1999 07/21/1999 07/27/1999 08/02/1999	307	11/03/1999 11/09/1999 11/17/1999 11/23/1999	70
Sugar Creek (U/s Memorial Drive to South River)	02/11/1999 02/17/199 02/23/1999 03/03/1999	570	04/07/1999 04/12/1999 04/19/1999 04/28/1999	2024	06/09/1999 06/16/1999 06/23/1999 07/07/1999	1032	09/08/1999 09/22/1999 09/29/1999 10/06/1999	1519
Sweetwater Creek (Lee Daniel Creek to Yellow River)	02/12/1999 02/16/1999 02/22/1999 03/05/1999	142	04/08/1999 04/13/1999 04/20/1999 04/29/1999	224	06/10/1999 06/17/1999 06/24/1999 07/08/1999	955	09/09/1999 09/23/1999 09/30/1999 10/07/1999	460
Swift Creek (Headwaters to Yellow River)	03/11/1999 03/17/1999 03/23/1999 04/08/1999	358	05/06/1999 05/17/1999 05/20/1999 06/03/1999	1920	07/08/1999 07/21/1999 07/27/1999 08/02/1999	657	11/03/1999 11/09/1999 11/17/1999 11/23/1999	276

Stream/Segment	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)
Tobesofkee Creek (Cole Creek to Todd Creek)	01/21/1999 01/26/1999 02/04/1999 02/16/1999	317	03/30/1999 04/13/1999 04/20/1999 04/27/1999	85	06/22/1999 06/29/1999 07/13/1999 07/20/1999	1370	09/21/1999 09/28/1999 10/06/1999 10/19/1999	205
Tobesofkee Creek (Lake Tobesofkee to Rocky Creek)	01/20/1999 01/28/1999 02/03/1999 02/17/1999	69	03/31/1999 04/15/1999 04/22/1999 04/29/1999	50	06/24/1999 07/01/1999 07/15/1999 07/22/1999	178	09/23/1999 09/30/1999 10/07/1999 10/21/1999	454
Town Branch (D/S Jackson S. WPCP to Aboothlacoosta Cr.)	NA	NA	NA	NA	NA	NA	NA	NA
Turkey Creek (Headwaters to Yellow River)	03/11/1999 03/17/1999 03/23/1999 04/08/1999	46	03/06/1999 03/17/1999 03/20/1999 04/03/1999	976	07/08/1999 07/21/1999 07/27/1999 08/02/1999	649	11/03/1999 11/09/1999 11/17/1999 11/23/1999	356
Turnpike Creek (Hwy 280 to Sugar Creek)	04/01/1999 04/08/1999 04/14/1999 04/21/1999	441	NA	NA	NA	NA	NA	NA
Tussahaw Creek (Wolf Creek to Lake Jackson)	01/07/1999 01/13/1999 01/20/1999 02/04/1999	138	04/06/1999 04/14/1999 04/21/1999 04/27/1999	340	06/08/1999 06/15/1999 06/22/1999 07/06/1999	302	09/07/1999 09/21/1999 09/28/1999 10/05/1999	2227
Walnut Creek (Headwaters to Ocmulgee River)	01/20/1999 01/28/1999 02/03/1999 02/17/1999	1149	03/31/1999 04/15/1999 04/22/1999 04/29/1999	264	06/24/1999 07/01/1999 07/15/1999 07/22/1999	330	09/23/1999 09/30/1999 10/07/1999 10/21/1999	159
Watson Creek (Headwaters to Yellow River)	03/11/1999 03/17/1999 03/23/1999 04/08/1999	40	05/06/1999 05/17/1999 05/20/1999 06/03/1999	669	07/08/1999 07/21/1999 07/27/1999 08/02/1999	611	11/03/1999 11/09/1999 11/17/1999 11/23/1999	70
Wise Creek (Headwaters to Kinnard Creek)	01/21/1999 01/26/1999 02/04/1999 02/16/1999	114	03/30/1999 04/13/1999 04/20/1999 04/27/1999	140	06/22/1999 06/29/1999 07/13/1999 07/20/1999	309	09/21/1999 09/28/1999 10/06/1999 10/19/1999	334

Stream/Segment	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)	Sample Period	Geometric Mean (#/100 ml.)
Yellow River (Big Haynes Creek to Jackson Lake)	01/07/1999 01/13/1999 01/20/1999 02/04/1999	265	04/06/1999 04/14/1999 04/21/1999 04/27/1999	92	06/08/1999 06/15/1999 06/22/1999 07/06/1999	288	09/07/1999 09/21/1999 09/28/1999 10/05/1999	929
Yellow River (Hwy 124 to Big Haynes Creek)	NA	NA	NA	NA	NA	NA	NA	NA
Yellow River (Sweetwater Creek to Hwy 124)	02/12/1999 02/16/1999 02/22/1999 03/05/1999	111	04/08/1999 04/13/1999 04/20/1999 04/29/1999	134	06/10/1999 06/17/1999 06/24/1999 07/08/1999	908	09/09/1999 09/23/1999 09/30/1999 10/07/1999	329
Yellow Water Creek (1 mile d/s Stark Road)	01/21/1999 01/26/1999 02/04/1999 02/16/1999	454	03/30/1999 04/13/1999 04/20/1999 04/27/1999	47	06/22/1999 06/29/1999 07/13/1999 07/20/1999	1072	09/21/1999 09/28/1999 10/06/1999 10/19/1999	226
Lake Jackson (Newton, Butts, and Jasper Counties)	NA	NA	NA	NA	NA	NA	NA	NA

NA = 1999 Sampling Data Not Available

Table 5 NPDES Facilities Discharging Fecal Coliform in the Ocmulgee River Basin

Facility Name	NPDES Permit No.	1999 Discharge Monitoring Reports		NPDES Permit Limits	
		Avg. Flow (MGD)	Avg. Fecal Coliform Loading[a] (counts/hr)	Avg. Flow (MGD)	Avg. Fecal Coliform Loading[b] (counts/hr)
Alamo Pond	GA0021440	No data available		0.07	2.21E+07
Amercord Inc	GA0026735	No data available		0.50	1.58E+08
Atlanta Custer Ave. CSO	GA0037141	No data available			
Atlanta Intrenchment Cr CSO	GA0037168	No data available			
Atlanta McDaniel St. CSO	GA0037133	No data available			
Barnesville Gordon Road	GA0021041	0.85	7.88E+07	1.20	3.79E+08
Cadwell WPCP	GA0025887	No data available		0.05	1.58E+07
Cagle's Inc Perry	GA0002844	No data available		3.50	1.11E+09
Clayton Co Northeast WPCP	GA0020575	3.98	1.79E+08	6.00	1.90E+09
Cochran WPCP	GA0032107	No data available		0.60	1.90E+08
DeKalb Co Polebridge WPCP	GA0026816	9.55	0.00E+00	20.00	6.32E+09
DeKalb Co Snapfinger WPCP	GA0024147	20.58	1.71E+08	36.00	1.14E+10
DNR High Falls State Park	GA0048135	No data available		0.02	6.32E+06
DOT Rest Area #14	GA0023612	No data available		0.025	7.90E+06
DOT Rest Area #22	GA0023591	No data available		0.045	1.42E+07
Eastman Roach Branch WPCP	GA0026310	No data available		0.90	2.84E+08
Forsyth Northeast	GA0031801	No data available		1.40	4.42E+08
Forsyth South	GA0024732	0.28	4.83E+05	0.60	1.90E+08
Fort Valley WPCP	GA0031046	1.47	3.56E+08	2.20	6.95E+08
Georgia Power Arkwright	GA0026069	No data available		480.85	1.52E+11
Griffin Cabin Creek	GA0020214	1.05	1.02E+07	1.50	4.74E+08
Gwinnett Co Beaver Ruin Creek	GA0032841	4.40	1.62E+07	4.50	1.42E+09
Gwinnett Co Big Haynes Creek	GA0033847	0.24	1.34E+06	0.50	1.58E+08
Gwinnett Co Jacks Creek	GA0047627	0.50	2.44E+06	1.00	3.16E+08
Gwinnett Co Jackson Creek	GA0030732	2.86	6.79E+06	3.00	9.48E+08
Gwinnett Co No Business Creek	GA0023973	0.84	5.24E+06	1.00	3.16E+08
Gwinnett Co Yellow River	GA0047911	10.21	3.80E+07	12.00	4.74E+08
Hawkinsville South	GA0020338	0.80	7.18E+07	1.30	4.11E+08
Helena WPCP	GA0048674	No data available		0.30	9.48E+07
Henry Co Camp Creek	GA0049352	1.02	4.85E+07	1.50	4.74E+08
Henry Co Hudson Bridge WPCP	GA0034711	0.46	4.64E+07	0.40	1.26E+08
Henry Co Panola Woods WPCP	GA0049808	0.08	2.46E+06	0.001	3.16E+05
Jackson Northeast	GA0032719	No data available		0.038	1.20E+07
Jackson Southside	GA0023931	0.28	1.30E+06	0.70	2.21E+08
Jackson Yellow Water Creek	GA0021831	0.20	2.73E+05	0.75	2.37E+08
Locust Grove East Pond	GA0049760	0.03	0.00E+00	0.05	1.58E+07
Locust Grove Skyland MHP	GA0049816	0.13	2.69E+07	0.20	6.32E+07
Locust Grove West Pond	GA0049778	0.10	0.00E+00	0.05	1.64E+07
Loganville WPCP	GA0020788	0.41	2.67E+06	0.575	1.82E+08
Macon Poplar Street	GA0024538	15.13	5.85E+08	20.00	6.32E+09
Macon Rocky Creek	GA0024546	20.48	7.60E+08	24.00	7.58E+09

Facility Name	NPDES Permit No.	1999 Discharge Monitoring Reports		NPDES Permit Limits	
		Avg. Flow (MGD)	Avg. Fecal Coliform Loading[a] (counts/hr)	Avg. Flow (MGD)	Avg. Fecal Coliform Loading[b] (counts/hr)
McRae Gum Swamp	GA0026298	No data available		0.07	2.21E+07
Middle GA Nursing Home	GA0049280	No data available		0.02	5.37E+06
Perry WPCP	GA0021334	2.02	2.52E+08	3.00	9.48E+08
Rockdale Co Almand WPCP	GA0021610	0.90	7.74E+06	1.25	3.95E+08
Rockdale Co Honey Creek	GA0022659	0.22	4.84E+06	0.30	9.48E+07
Rockdale Co Quigg Branch	GA0047678	2.80	1.53E+07	4.00	1.26E+09
Rockdale Co Scott Creek	GA0026239	0.22	3.06E+07	0.22	6.95E+07
Rockdale Co Snapping Shoals	GA0023035	0.35	3.42E+06	0.45	1.42E+08
Scotland Pond	GA0032344	No data available		0.18	5.69E+07
Spring Industries Inc	GA0003409	1.02	5.29E+07	1.00	6.32E+08
Stockbridge WPCP	GA0023337	0.51	2.66E+06	1.50	4.74E+08
USAF Robins AFB	GA0002852	No data available		2.10	6.64E+08
Warner Robins Sandy Run Creek	GA0030325	5.60	9.99E+07	9.00	2.84E+09
William Carter Co	GA0003115	No data available		1.30	4.11E+08

a Loadings based on CY 1999 average fecal coliform concentration and mean flow reported on DMRs.

b Loadings based on Monthly Average fecal coliform permit limit at monthly average permitted flow (design flow used for facilities without a permitted monthly flow limit). A fecal coliform loading of 200 counts/100 mL was assumed for facilities without a fecal coliform bacteria permit limit.

Table 6 Livestock Distribution In Ocmulgee River Basin

Stream/Segment	Livestock						
	Beef Cow	Milk Cow	Cattle	Chicken Layers	Chickens-Broilers Sold	Hogs	Sheep
Alcovy River - (Cedar Creek to Bay Creek)	47	0	907	1252	403475	6	5
Alligator Creek - (Batson Creek to Lime Sink Creek)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Almand Branch - (Tanyard Branch to Snapping Shoals)	0	0	58	9	0	0	10
Bay Creek - (Headwaters to Beaver Creek)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Beaver Ruin Creek - (Gwinnett County)	0	0	0	0	0	0	0
Big Cotton Indian Creek - (Panther Creek to Brush Creek)	10	0	20	0	1	5	8
Big Flat Creek - (Headwaters to Flat Creek)	388	3	855	10267	609696	14	10
Big Haynes Creek - (Brushy Creek to Little Panther Creek)	21	0	960	555	404755	5	6
Big Haynes Creek - (Headwaters to Brushy Creek)	19	0	944	505	399636	5	5
Big Haynes Creek - (Little Haynes Creek to Yellow River)	371	3	1839	9023	894826	18	41
Big Indian Creek - (Mossy Creek to Ocmulgee River)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Big Sandy Creek - (Aboothlacoosta Creek to Ocmulgee River)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Bromolow Creek - (Headwaters to Beaver Ruin Creek)	0	0	0	0	66	0	0
Cabin Creek - (Headwaters Griffin to Towaliga River)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Camp Creek - (Headwaters to Jackson Creek)	6	0	17	0	1883	0	0
Cedar Creek - (Headwaters to Alcovy River)	5	0	164	143	70597	1	1
Cobbs Creek - (Headwaters to Shoal Creek)	0	0	0	0	0	0	0
Conley Creek - (Headwaters to South River)	66	0	129	0	0	0	0
Doless Creek - (Headwaters to Doolittle Creek)	0	0	0	0	0	0	0
Doolittle Creek - (Headwaters to South River)	1	0	2	0	0	0	0
Falling Creek - (Little Falling Creek to Ocmulgee River)	TBD	TBD	TBD	TBD	TBD	TBD	TBD

Stream/Segment	Livestock						
	Beef Cow	Milk Cow	Cattle	Chicken Layers	Chickens-Broilers Sold	Hogs	Sheep
Honey Creek - (Headwaters to South River)	65	0	367	0	38	0	42
Hopkins Creek - (Headwaters to Alcovy River)	0	0	84	0	34404	0	0
House Creek - (Ball Creek to Little House Creek)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Intrenchment Creek - (Headwaters to South River)	1	0	2	0	0	0	0
Jacks Creek - (Headwaters to Yellow River)	0	0	1	0	266	0	0
Jackson Creek - (Gwinnett County)	0	0	8	0	3301	0	0
Little Haynes Creek - (Hwy 20 to Big Haynes Creek)	306	3	625	7403	422454	11	9
Little Stone Mountain Creek- (Headwaters to Stone Mtn Lake)	2	0	3	0	0	0	0
Little Suwanee Creek - (Tributary to Yellow River)	0	0	24	0	9858	0	0
McClain Branch - (Headwaters to Honey Creek)	0	0	33	5	0	0	6
No Business Creek - (Headwaters to Norris Lake)	0	0	178	1	69827	1	2
North Branch South River - (Atlanta)	1	0	2	0	0	0	0
Ocmulgee River - (Beaverdam Creek to Walnut Creek)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Ocmulgee River - (Sandy Run Creek to Big Indian Creek)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Ocmulgee River - (Tobesofkee Creek to Echeconnee Creek)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Pew Creek - (Gwinnett County)	0	0	79	0	32455	0	0
Rocky Creek - (1 mile u/s Rocky Creek Rd. - Tobesofkee Cr.)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Shetley Creek - (Headwaters to Bromolow Creek)	0	0	0	0	0	0	0
Shoal Creek - (Headwaters to Alcovy River)	0	0	93	0	37971	0	0
Shoal Creek - (Headwaters to South River)	5	0	9	0	0	0	0
Snapfinger Creek - (Dekalb County)	4	0	8	0	0	0	0
Snapping Shoals Creek - (Almand Branch to South River)	341	15	800	25	61738	10	28
South River - (Atlanta to Flakes Mill Road)	92	0	182	0	0	0	0
South River - (Flakes Mill Road to Pole Bridge Creek)	69	0	211	4	0	0	5

Stream/Segment	Livestock						
	Beef Cow	Milk Cow	Cattle	Chicken Layers	Chickens-Broilers Sold	Hogs	Sheep
South River - (Hwy 20 to Snapping Shoals Creek)	743	19	5539	26	77802	24	48
South River - (Pole Bridge Creek to Hwy 20)	353	0	1416	77	1558	1	87
South River - (Snapping Shoals to Jackson Lake)	223	14	927	0	19139	5	2
Stone Mountain Creek - (Headwaters to Stone Mountain Lake)	0	0	0	0	0	0	0
Sugar Creek - (U/s Memorial Drive to South River)	0	0	1	0	0	0	0
Sweetwater Creek - (Lee Daniel Creek to Yellow River)	0	0	0	0	82366	1	1
Swift Creek - (Headwaters to Yellow River)	61	0	119	0	0	0	0
Tobesofkee Creek - (Cole Creek to Todd Creek)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Tobesofkee Creek - (Lake Tobesofkee to Rocky Creek)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Town Branch - (D/S Jackson S. WPCP to Aboothlacoosta Cr.)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Turkey Creek - (Headwaters to Yellow River)	0	0	9	0	3589	0	0
Turnpike Creek - (Hwy 280 to Sugar Creek)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Tussahaw Creek - (Wolf Creek to Lake Jackson)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Walnut Creek - (Headwaters to Ocmulgee River)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Watson Creek - (Headwaters to Yellow River)	0	0	10	0	3988	0	0
Wise Creek - (Headwaters to Kinnard Creek)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Yellow River - (Big Haynes Creek to Jackson Lake)	2133	52	8296	22343	3037747	79	119
Yellow River - (Hwy 124 to Big Haynes Creek)	190	0	1281	43	263779	2	47
Yellow River - (Sweetwater Creek to Hwy 124)	8	0	488	0	192690	1	1
Yellow Water Creek - (1 mile d/s Stark Road)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Lake Jackson - (Newton, Butts, and Jasper Counties)	TBD	TBD	TBD	TBD	TBD	TBD	TBD

TBD = To Be Determined

Table 7 Estimated Number of Septic Systems In Ocmulgee River Basin

Stream/Segment	Population on Septic Systems
Alcovy River - (Cedar Creek to Bay Creek)	TBD
Alligator Creek - (Batson Creek to Lime Sink Creek)	TBD
Almand Branch - (Tanyard Branch to Snapping Shoals)	TBD
Bay Creek - (Headwaters to Beaver Creek)	TBD
Beaver Ruin Creek - (Gwinnett County)	TBD
Big Cotton Indian Creek - (Panther Creek to Brush Creek)	TBD
Big Flat Creek - (Headwaters to Flat Creek)	TBD
Big Haynes Creek - (Brushy Creek to Little Panther Creek)	TBD
Big Haynes Creek - (Headwaters to Brushy Creek)	TBD
Big Haynes Creek - (Little Haynes Creek to Yellow River)	TBD
Big Indian Creek - (Mossy Creek to Ocmulgee River)	TBD
Big Sandy Creek - (Aboothlacoosta Creek to Ocmulgee River)	TBD
Bromolow Creek - (Headwaters to Beaver Ruin Creek)	TBD
Cabin Creek - (Headwaters Griffin to Towaliga River)	TBD
Camp Creek - (Headwaters to Jackson Creek)	TBD
Cedar Creek - (Headwaters to Alcovy River)	TBD
Cobbs Creek - (Headwaters to Shoal Creek)	18,650
Conley Creek - (Headwaters to South River)	22,785
Doless Creek - (Headwaters to Doolittle Creek)	5,668
Doolittle Creek - (Headwaters to South River)	17,785
Falling Creek - (Little Falling Creek to Ocmulgee River)	TBD
Honey Creek - (Headwaters to South River)	TBD
Hopkins Creek - (Headwaters to Alcovy River)	TBD
House Creek - (Ball Creek to Little House Creek)	TBD
Intrenchment Creek - (Headwaters to South River)	6,391
Jacks Creek - (Headwaters to Yellow River)	TBD
Jackson Creek - (Gwinnett County)	TBD
Little Haynes Creek - (Hwy 20 to Big Haynes Creek)	TBD
Little Stone Mountain Creek- (Headwaters to Stone Mountain Lake)	TBD
Little Suwanee Creek - (Tributary to Yellow River)	TBD
McClain Branch - (Headwaters to Honey Creek)	1,962
No Business Creek - (Headwaters to Norris Lake)	TBD
North Branch South River - (Atlanta)	823
Ocmulgee River - (Beaverdam Creek to Walnut Creek)	TBD
Ocmulgee River - (Sandy Run Creek to Big Indian Creek)	TBD
Ocmulgee River - (Tobesofkee Creek to Echeconnee Creek)	TBD
Pew Creek - (Gwinnett County)	TBD
Rocky Creek - (1 mile u/s Rocky Creek Rd. - Tobesofkee Cr.)	TBD
Shetley Creek - (Headwaters to Bromolow Creek)	TBD
Shoal Creek - (Headwaters to Alcovy River)	TBD
Shoal Creek - (Headwaters to South River)	16,228
Snapfinger Creek - (Dekalb County)	90,736
Snapping Shoals Creek - (Almand Branch to South River)	TBD
South River - (Atlanta to Flakes Mill Road)	TBD
South River - (Flakes Mill Road to Pole Bridge Creek)	TBD
South River - (Hwy 20 to Snapping Shoals Creek)	TBD

Stream/Segment	Population on Septic Systems
South River - (Pole Bridge Creek to Hwy 20)	TBD
South River - (Snapping Shoals to Jackson Lake)	TBD
Stone Mountain Creek - (Headwaters to Stone Mountain Lake)	TBD
Sugar Creek - (U/s Memorial Drive to South River)	10,552
Sweetwater Creek - (Lee Daniel Creek to Yellow River)	TBD
Swift Creek - (Headwaters to Yellow River)	TBD
Tobesofkee Creek - (Cole Creek to Todd Creek)	TBD
Tobesofkee Creek - (Lake Tobesofkee to Rocky Creek)	TBD
Town Branch - (D/S Jackson S. WPCP to Aboothlacoosta Cr.)	TBD
Turkey Creek - (Headwaters to Yellow River)	TBD
Turnpike Creek - (Hwy 280 to Sugar Creek)	TBD
Tussahaw Creek - (Wolf Creek to Lake Jackson)	TBD
Walnut Creek - (Headwaters to Ocmulgee River)	TBD
Watson Creek - (Headwaters to Yellow River)	TBD
Wise Creek - (Headwaters to Kinnard Creek)	TBD
Yellow River - (Big Haynes Creek to Jackson Lake)	TBD
Yellow River - (Hwy 124 to Big Haynes Creek)	TBD
Yellow River - (Sweetwater Creek to Hwy 124)	TBD
Yellow Water Creek - (1 mile d/s Stark Road)	TBD
Lake Jackson - (Newton, Butts, and Jasper Counties)	TBD

TBD = To Be Determined

Table 8 Loading Rates and Instream Fecal Coliform Concentrations for Existing Conditions During Critical Period

Stream/Segment	Critical Conditions Period	Loading from NPDES Discharges (counts/30 days)	Loading from Other Direct Sources (counts/30 days)	Loading from Surface Runoff (counts/30 days)	Geometric Mean In-stream Fecal Coliform Concentration (counts/100 ml)
Alcovy River - (Cedar Creek to Bay Creek)	TBD	TBD	TBD	TBD	TBD
Alligator Creek - (Batson Creek to Lime Sink Creek)	TBD	TBD	TBD	TBD	TBD
Almand Branch - (Tanyard Branch to Snapping Shoals)	TBD	TBD	TBD	TBD	TBD
Bay Creek - (Headwaters to Beaver Creek)	TBD	TBD	TBD	TBD	TBD
Beaver Ruin Creek - (Gwinnett County)	TBD	TBD	TBD	TBD	TBD
Big Cotton Indian Creek - (Panther Creek to Brush Creek)	TBD	TBD	TBD	TBD	TBD
Big Flat Creek - (Headwaters to Flat Creek)	TBD	TBD	TBD	TBD	TBD
Big Haynes Creek - (Brushy Creek to Little Panther Creek)	TBD	TBD	TBD	TBD	TBD
Big Haynes Creek - (Headwaters to Brushy Creek)	TBD	TBD	TBD	TBD	TBD
Big Haynes Creek - (Little Haynes Creek to Yellow River)	TBD	TBD	TBD	TBD	TBD
Big Indian Creek - (Mossy Creek to Ocmulgee River)	TBD	TBD	TBD	TBD	TBD
Big Sandy Creek - (Aboothlacoosta Creek to Ocmulgee River)	TBD	TBD	TBD	TBD	TBD
Bromolow Creek - (Headwaters to Beaver Ruin Creek)	TBD	TBD	TBD	TBD	TBD
Cabin Creek - (Headwaters Griffin to Towaliga River)	TBD	TBD	TBD	TBD	TBD
Camp Creek - (Headwaters to Jackson Creek)	TBD	TBD	TBD	TBD	TBD
Cedar Creek - (Headwaters to Alcovy River)	TBD	TBD	TBD	TBD	TBD
Cobbs Creek - (Headwaters to Shoal Creek)	8/7/98 - 9/5/98	0.0	1.45E+12	4.1E+13	1,107.3
Conley Creek - (Headwaters to South River)	6/3/99 - 7/2/99	0.0	3.68E+11	1.43E+13	369.7

Stream/Segment	Critical Conditions Period	Loading from NPDES Discharges (counts/30 days)	Loading from Other Direct Sources (counts/30 days)	Loading from Surface Runoff (counts/30 days)	Geometric Mean In-stream Fecal Coliform Concentration (counts/100 ml)
Doless Creek - (Headwaters to Doolittle Creek)	7/3/99 - 8/28/99	0.0	1.45E+11	7.69E+11	632.4
Doolittle Creek - (Headwaters to South River)	5/31/99 - 6/29/99	0.0	1.33E+11	1.11E+13	494.8
Falling Creek - (Little Falling Creek to Ocmulgee River)	TBD	TBD	TBD	TBD	TBD
Honey Creek - (Headwaters to South River)	7/29/95 - 8/27/95	5.01E+10	5.64E+11	6.66E+11	661.0
Hopkins Creek - (Headwaters to Alcovy River)	TBD	TBD	TBD	TBD	TBD
House Creek - (Ball Creek to Little House Creek)	TBD	TBD	TBD	TBD	TBD
Intrenchment Creek - (Headwaters to South River)	8/7/98 - 9/5/98	0.0	1.08E+16	2.80E+12	1,746.4
Jacks Creek - (Headwaters to Yellow River)	TBD	TBD	TBD	TBD	TBD
Jackson Creek - (Gwinnett County)	TBD	TBD	TBD	TBD	TBD
Little Haynes Creek - (Hwy 20 to Big Haynes Creek)	TBD	TBD	TBD	TBD	TBD
Little Stone Mountain Creek - (Headwaters to Stne Mtn Lake)	TBD	TBD	TBD	TBD	TBD
Little Suwanee Creek - (Tributary to Yellow River)	TBD	TBD	TBD	TBD	TBD
McClain Branch - (Headwaters to Honey Creek)	7/16/95 - 8/14/95	5.01E+10	1.83E+11	3.42E+12	837.4
No Business Creek - (Headwaters to Norris Lake)	TBD	TBD	TBD	TBD	TBD
North Branch South River - (Atlanta)	9/16/96 - 10/15/96	0.0	1.16E+14	7.69E+11	918.9
Ocmulgee River - (Beaverdam Creek to Walnut Creek)	TBD	TBD	TBD	TBD	TBD
Ocmulgee River - (Sandy Run Creek to Big Indian Creek)	TBD	TBD	TBD	TBD	TBD
Ocmulgee River - (Tobesofkee Creek to Echeconnee Creek)	TBD	TBD	TBD	TBD	TBD
Pew Creek - (Gwinnett County)	TBD	TBD	TBD	TBD	TBD

Stream/Segment	Critical Conditions Period	Loading from NPDES Discharges (counts/30 days)	Loading from Other Direct Sources (counts/30 days)	Loading from Surface Runoff (counts/30 days)	Geometric Mean In-stream Fecal Coliform Concentration (counts/100 ml)
Rocky Creek - (1 mile u/s Rocky Creek Rd. - Tobesofkee Cr.)	TBD	TBD	TBD	TBD	TBD
Shetley Creek - (Headwaters to Bromolow Creek)	TBD	TBD	TBD	TBD	TBD
Shoal Creek - (Headwaters to Alcovy River)	TBD	TBD	TBD	TBD	TBD
Shoal Creek - (Headwaters to South River)	5/28/99 - 6/26/99	0.0	1.16E+12	4.13E+13	1,283.6
Snapfinger Creek - (Dekalb County)	10/5/96 - 11/3/96	0.0	1.09E+12	2.26E+12	904.2
Snapping Shoals Creek - (Almand Branch to South River)	TBD	TBD	TBD	TBD	TBD
South River - (Atlanta to Flakes Mill Road)	TBD	TBD	TBD	TBD	TBD
South River - (Flakes Mill Road to Pole Bridge Creek)	TBD	TBD	TBD	TBD	TBD
South River - (Hwy 20 to Snapping Shoals Creek)	TBD	TBD	TBD	TBD	TBD
South River - (Pole Bridge Creek to Hwy 20)	TBD	TBD	TBD	TBD	TBD
South River - (Snapping Shoals to Jackson Lake)	TBD	TBD	TBD	TBD	TBD
Stone Mountain Creek - (Headwaters to Stone Mountain Lake)	TBD	TBD	TBD	TBD	TBD
Sugar Creek - (U/s Memorial Drive to South River)	6/2/99 - 7/1/99	0.0	1.18E+12	2.42E+13	1,699.4
Sweetwater Creek - (Lee Daniel Creek to Yellow River)	TBD	TBD	TBD	TBD	TBD
Swift Creek - (Headwaters to Yellow River)	TBD	TBD	TBD	TBD	TBD
Tobesofkee Creek - (Cole Creek to Todd Creek)	TBD	TBD	TBD	TBD	TBD
Tobesofkee Creek - (Lake Tobesofkee to Rocky Creek)	TBD	TBD	TBD	TBD	TBD
Town Branch - (D/S Jackson S. WPCP to Aboothlacoosta Cr.)	TBD	TBD	TBD	TBD	TBD
Turkey Creek - (Headwaters to Yellow River)	TBD	TBD	TBD	TBD	TBD
Turnpike Creek - (Hwy 280 to Sugar Creek)	TBD	TBD	TBD	TBD	TBD

Stream/Segment	Critical Conditions Period	Loading from NPDES Discharges (counts/30 days)	Loading from Other Direct Sources (counts/30 days)	Loading from Surface Runoff (counts/30 days)	Geometric Mean In-stream Fecal Coliform Concentration (counts/100 ml)
Tussahaw Creek - (Wolf Creek to Lake Jackson)	TBD	TBD	TBD	TBD	TBD
Walnut Creek - (Headwaters to Ocmulgee River)	TBD	TBD	TBD	TBD	TBD
Watson Creek - (Headwaters to Yellow River)	TBD	TBD	TBD	TBD	TBD
Wise Creek - (Headwaters to Kinnard Creek)	TBD	TBD	TBD	TBD	TBD
Yellow River - (Big Haynes Creek to Jackson Lake)	TBD	TBD	TBD	TBD	TBD
Yellow River - (Hwy 124 to Big Haynes Creek)	TBD	TBD	TBD	TBD	TBD
Yellow River - (Sweetwater Creek to Hwy 124)	TBD	TBD	TBD	TBD	TBD
Yellow Water Creek - (1 mile d/s Stark Road)	TBD	TBD	TBD	TBD	TBD
Lake Jackson - (Newton, Butts, and Jasper Counties)	TBD	TBD	TBD	TBD	TBD

TBD = To Be Determined

Table 9 TMDL Components

Stream/Segment	WLAs (counts/30 days)	LAs (counts/30 days)	Margin of Safety	TMDL (counts/30 days)
Alcovy River - (Cedar Creek to Bay Creek)	TBD	TBD	Implicit + 10% Explicit	TBD
Alligator Creek - (Batson Creek to Lime Sink Creek)	TBD	TBD	Implicit + 10% Explicit	TBD
Almand Branch - (Tanyard Branch to Snapping Shoals)	TBD	TBD	Implicit + 10% Explicit	TBD
Bay Creek - (Headwaters to Beaver Creek)	TBD	TBD	Implicit + 10% Explicit	TBD
Beaver Ruin Creek - (Gwinnett County)	TBD	TBD	Implicit + 10% Explicit	TBD
Big Cotton Indian Creek - (Panther Creek to Brush Creek)	TBD	TBD	Implicit + 10% Explicit	TBD
Big Flat Creek - (Headwaters to Flat Creek)	TBD	TBD	Implicit + 10% Explicit	TBD
Big Haynes Creek - (Brushy Creek to Little Panther Creek)	TBD	TBD	Implicit + 10% Explicit	TBD
Big Haynes Creek - (Headwaters to Brushy Creek)	TBD	TBD	Implicit + 10% Explicit	TBD
Big Haynes Creek - (Little Haynes Creek to Yellow River)	TBD	TBD	Implicit + 10% Explicit	TBD
Big Indian Creek - (Mossy Creek to Ocmulgee River)	TBD	TBD	Implicit + 10% Explicit	TBD
Big Sandy Creek - (Aboothlacoosta Creek to Ocmulgee River)	TBD	TBD	Implicit + 10% Explicit	TBD
Bromolow Creek - (Headwaters to Beaver Ruin Creek)	TBD	TBD	Implicit + 10% Explicit	TBD
Cabin Creek - (Headwaters Griffin to Towaliga River)	TBD	TBD	Implicit + 10% Explicit	TBD
Camp Creek - (Headwaters to Jackson Creek)	TBD	TBD	Implicit + 10% Explicit	TBD
Cedar Creek - (Headwaters to Alcovy River)	TBD	TBD	Implicit + 10% Explicit	TBD
Cobbs Creek - (Headwaters to Shoal Creek)	0.0	2.96E+12	Implicit + 10% Explicit	2.96E+12
Conley Creek - (Headwaters to South River)	0.0	4.88E+12	Implicit + 10% Explicit	4.88E+12
Doless Creek - (Headwaters to Doolittle Creek)	0.0	8.52E+10	Implicit + 10% Explicit	8.52E+10
Doolittle Creek - (Headwaters to South River)	0.0	1.15E+12	Implicit + 10% Explicit	1.15E+12
Falling Creek - (Little Falling Creek to Ocmulgee River)	TBD	TBD	Implicit + 10% Explicit	TBD
Honey Creek - (Headwaters to South River)	4.25E+10	4.88E+12	Implicit + 10% Explicit	4.92E+12
Hopkins Creek - (Headwaters to Alcovy River)	TBD	TBD	Implicit + 10% Explicit	TBD
House Creek - (Ball Creek to Little House Creek)	TBD	TBD	Implicit + 10% Explicit	TBD
Intrenchment Creek - (Headwaters to South River)	0.0	1.53E+14	Implicit + 10% Explicit	1.53E+14
Jacks Creek - (Headwaters to Yellow River)	TBD	TBD	Implicit + 10% Explicit	TBD
Jackson Creek - (Gwinnett County)	TBD	TBD	Implicit + 10% Explicit	TBD
Little Haynes Creek - (Hwy 20 to Big Haynes Creek)	TBD	TBD	Implicit + 10% Explicit	TBD
Little Stone Mountain Creek - (Headwaters to Stone Mountain Lake)	TBD	TBD	Implicit + 10% Explicit	TBD
Little Suwanee Creek - (Tributary to Yellow River)	TBD	TBD	Implicit + 10% Explicit	TBD

Stream/Segment	WLAs (counts/30 days)	LAs (counts/30 days)	Margin of Safety	TMDL (counts/30 days)
McClain Branch - (Headwaters to Honey Creek)	4.25E+10	2.95E+11	Implicit + 10% Explicit	3.37E+11
No Business Creek - (Headwaters to Norris Lake)	TBD	TBD	Implicit + 10% Explicit	TBD
North Branch South River - (Atlanta)	0.0	3.89E+12	Implicit + 10% Explicit	3.89E+12
Ocmulgee River - (Beaverdam Creek to Walnut Creek)	TBD	TBD	Implicit + 10% Explicit	TBD
Ocmulgee River - (Sandy Run Creek to Big Indian Creek)	TBD	TBD	Implicit + 10% Explicit	TBD
Ocmulgee River - (Tobesofkee Creek to Echeconnee Creek)	TBD	TBD	Implicit + 10% Explicit	TBD
Pew Creek - (Gwinnett County)	TBD	TBD	Implicit + 10% Explicit	TBD
Rocky Creek - (1 mile u/s Rocky Creek Rd. - Tobesofkee Cr.)	TBD	TBD	Implicit + 10% Explicit	TBD
Shetley Creek - (Headwaters to Bromolow Creek)	TBD	TBD	Implicit + 10% Explicit	TBD
Shoal Creek - (Headwaters to Alcovy River)	TBD	TBD	Implicit + 10% Explicit	TBD
Shoal Creek - (Headwaters to South River)	0.0	1.29E+12	Implicit + 10% Explicit	1.29E+12
Snapfinger Creek - (Dekalb County)	0.0	7.59E+11	Implicit + 10% Explicit	7.59E+11
Snapping Shoals Creek - (Almand Branch to South River)	TBD	TBD	Implicit + 10% Explicit	TBD
South River - (Atlanta to Flakes Mill Road)	TBD	TBD	Implicit + 10% Explicit	TBD
South River - (Flakes Mill Road to Pole Bridge Creek)	TBD	TBD	Implicit + 10% Explicit	TBD
South River - (Hwy 20 to Snapping Shoals Creek)	TBD	TBD	Implicit + 10% Explicit	TBD
South River - (Pole Bridge Creek to Hwy 20)	TBD	TBD	Implicit + 10% Explicit	TBD
South River - (Snapping Shoals to Jackson Lake)	TBD	TBD	Implicit + 10% Explicit	TBD
Stone Mountain Creek - (Headwaters to Stone Mountain Lake)	TBD	TBD	Implicit + 10% Explicit	TBD
Sugar Creek - (U/s Memorial Drive to South River)	0.0	1.68E+12	Implicit + 10% Explicit	1.68E+12
Sweetwater Creek - (Lee Daniel Creek to Yellow River)	TBD	TBD	Implicit + 10% Explicit	TBD
Swift Creek - (Headwaters to Yellow River)	TBD	TBD	Implicit + 10% Explicit	TBD
Tobesofkee Creek - (Cole Creek to Todd Creek)	TBD	TBD	Implicit + 10% Explicit	TBD
Tobesofkee Creek - (Lake Tobesofkee to Rocky Creek)	TBD	TBD	Implicit + 10% Explicit	TBD
Town Branch - (D/S Jackson S. WPCP to Aboothlacoosta Cr.)	TBD	TBD	Implicit + 10% Explicit	TBD
Turkey Creek - (Headwaters to Yellow River)	TBD	TBD	Implicit + 10% Explicit	TBD
Turnpike Creek - (Hwy 280 to Sugar Creek)	TBD	TBD	Implicit + 10% Explicit	TBD
Tussahaw Creek - (Wolf Creek to Lake Jackson)	TBD	TBD	Implicit + 10% Explicit	TBD
Walnut Creek - (Headwaters to Ocmulgee River)	TBD	TBD	Implicit + 10% Explicit	TBD
Watson Creek - (Headwaters to Yellow River)	TBD	TBD	Implicit + 10% Explicit	TBD
Wise Creek - (Headwaters to Kinnard Creek)	TBD	TBD	Implicit + 10% Explicit	TBD
Yellow River - (Big Haynes Creek to Jackson Lake)	TBD	TBD	Implicit + 10% Explicit	TBD
Yellow River - (Hwy 124 to Big Haynes Creek)	TBD	TBD	Implicit + 10% Explicit	TBD

Stream/Segment	WLAs (counts/30 days)	LAs (counts/30 days)	Margin of Safety	TMDL (counts/30 days)
Yellow River - (Sweetwater Creek to Hwy 124)	TBD	TBD	Implicit + 10% Explicit	TBD
Yellow Water Creek - (1 mile d/s Stark Road)	TBD	TBD	Implicit + 10% Explicit	TBD
Lake Jackson - (Newton, Butts, and Jasper Counties)	TBD	TBD	Implicit + 10% Explicit	TBD

TBD = To Be Determined

Table 10 Load Allocations for Ocmulgee River Basin

Stream/Segment	Most Significant Impact(s)	Loading from Point Sources (counts/30 days)	Non-point Sources		Overall Loading (counts/30 days)
			Loading from Other Direct Sources (counts/30 days)	Loading from Surface Runoff (counts/30 days)	
Alcovy River (Cedar Creek to Bay Creek)	TBD	TBD	TBD	TBD	TBD
Alligator Creek (Batson Creek to Lime Sink Creek)	TBD	TBD	TBD	TBD	TBD
Almand Branch (Tanyard Branch to Snapping Shoals)	TBD	TBD	TBD	TBD	TBD
Bay Creek (Headwaters to Beaver Creek)	TBD	TBD	TBD	TBD	TBD
Beaver Ruin Creek (Gwinnett County)	TBD	TBD	TBD	TBD	TBD
Big Cotton Indian Cr. (Panther Creek to Brush Creek)	TBD	TBD	TBD	TBD	TBD
Big Flat Creek (Headwaters to Flat Creek)	TBD	TBD	TBD	TBD	TBD
Big Haynes Creek (Brushy Creek to Little Panther Creek)	TBD	TBD	TBD	TBD	TBD
Big Haynes Creek (Headwaters to Brushy Creek)	TBD	TBD	TBD	TBD	TBD
Big Haynes Creek (Little Haynes Creek to Yellow River)	TBD	TBD	TBD	TBD	TBD
Big Indian Creek (Mossy Creek to Ocmulgee River)	TBD	TBD	TBD	TBD	TBD
Big Sandy Creek (Aboothlacoosta Creek to Ocmulgee River)	TBD	TBD	TBD	TBD	TBD
Bromolow Creek (Headwaters to Beaver Ruin Creek)	TBD	TBD	TBD	TBD	TBD
Cabin Creek (Headwaters Griffin to Towaliga River)	TBD	TBD	TBD	TBD	TBD

Stream/Segment	Most Significant Impact(s)	Loading from Point Sources (counts/30 days)	Non-point Sources		Overall Loading (counts/30 days)
			Loading from Other Direct Sources (counts/30 days)	Loading from Surface Runoff (counts/30 days)	
Camp Creek (Headwaters to Jackson Creek)	TBD	TBD	TBD	TBD	TBD
Cedar Creek (Headwaters to Alcovy River)	TBD	TBD	TBD	TBD	TBD
Cobbs Creek (Headwaters to Shoal Creek)	Urban Runoff	0.0	1.90E+11	2.77E+12	2.96E+12
Conley Creek (Headwaters to South River)	Urban Runoff	0.0	2.18E+11	4.66E+12	4.88E+12
Doless Creek (Headwaters to Doolittle Creek)	Urban Runoff	0.0	4.07E+10	4.46E+10	8.52E+10
Doolittle Creek (Headwaters to South River)	Urban Runoff	0.0	5.15E+10	1.10E+12	1.15E+12
Falling Creek (Little Falling Creek to Ocmulgee River)	TBD	TBD	TBD	TBD	TBD
Honey Creek (Headwaters to South River)	Urban nonpoint sources	4.25E+10	1.97E+11	4.60E+10	2.87E+11
Hopkins Creek (Headwaters to Alcovy River)	TBD	TBD	TBD	TBD	TBD
House Creek (Ball Creek to Little House Creek)	TBD	TBD	TBD	TBD	TBD
Intrenchment Creek (Headwaters to South River)	Combined Sewer Overflows (CSOs)	0.0	3.69E+12	2.03E+11	3.89E+12
Jacks Creek (Headwaters to Yellow River)	TBD	TBD	TBD	TBD	TBD
Jackson Creek (Gwinnett County)	TBD	TBD	TBD	TBD	TBD
Little Haynes Creek (Hwy 20 to Big Haynes Creek)	TBD	TBD	TBD	TBD	TBD
Little Stone Mountain Creek (Headwaters to Stone Mountain Lake)	TBD	TBD	TBD	TBD	TBD
Little Suwanee Creek (Tributary to Yellow River)	TBD	TBD	TBD	TBD	TBD

Stream/Segment	Most Significant Impact(s)	Loading from Point Sources (counts/30 days)	Non-point Sources		Overall Loading (counts/30 days)
			Loading from Other Direct Sources (counts/30 days)	Loading from Surface Runoff (counts/30 days)	
McClain Branch (Headwaters to Honey Creek)	Urban Runoff	4.25E+10	4.80E+10	2.46E+11	3.37E+11
No Business Creek (Headwaters to Norris Lake)	TBD	TBD	TBD	TBD	TBD
North Branch South River (Atlanta)	Combined Sewer Overflows (CSOs)	0.0	3.69E+12	2.03E+11	3.89E+12
Ocmulgee River (Beaverdam Creek to Walnut Creek)	TBD	TBD	TBD	TBD	TBD
Ocmulgee River (Sandy Run Creek to Big Indian Creek)	TBD	TBD	TBD	TBD	TBD
Ocmulgee River (Tobesofkee Creek to Echeconnee Creek)	TBD	TBD	TBD	TBD	TBD
Pew Creek (Gwinnett County)	TBD	TBD	TBD	TBD	TBD
Rocky Creek (1 mile u/s Rocky Cr. Rd. to Tobesofkee Cr.)	TBD	TBD	TBD	TBD	TBD
Shetley Creek (Headwaters to Bromolow Creek)	TBD	TBD	TBD	TBD	TBD
Shoal Creek (Headwaters to Alcovy River)	TBD	TBD	TBD	TBD	TBD
Shoal Creek (Headwaters to South River)	Urban Runoff	0.0	3.12E+11	9.79E+11	1.29E+12
Snapfinger Creek (Dekalb County)	Urban Runoff	0.0	3.61E+11	3.98E+11	7.59E+11
Snapping Shoals Creek (Almand Branch to South River)	TBD	TBD	TBD	TBD	TBD
South River (Atlanta to Flakes Mill Road)	TBD	TBD	TBD	TBD	TBD
South River (Flakes Mill Road to Pole Bridge Creek)	TBD	TBD	TBD	TBD	TBD

Stream/Segment	Most Significant Impact(s)	Loading from Point Sources (counts/30 days)	Non-point Sources		Overall Loading (counts/30 days)
			Loading from Other Direct Sources (counts/30 days)	Loading from Surface Runoff (counts/30 days)	
South River (Hwy 20 to Snapping Shoals Creek)	TBD	TBD	TBD	TBD	TBD
South River (Pole Bridge Creek to Hwy 20)	TBD	TBD	TBD	TBD	TBD
South River (Snapping Shoals to Jackson Lake)	TBD	TBD	TBD	TBD	TBD
Stone Mountain Creek (Headwaters to Stone Mountain Lake)	TBD	TBD	TBD	TBD	TBD
Sugar Creek (U/s Memorial Drive to South River)	Urban Runoff	0.0	1.37E+11	1.55E+12	1.68E+12
Sweetwater Creek (Lee Daniel Creek to Yellow River)	TBD	TBD	TBD	TBD	TBD
Swift Creek (Headwaters to Yellow River)	TBD	TBD	TBD	TBD	TBD
Tobesofkee Creek (Cole Creek to Todd Creek)	TBD	TBD	TBD	TBD	TBD
Tobesofkee Creek (Lake Tobesofkee to Rocky Creek)	TBD	TBD	TBD	TBD	TBD
Town Branch (D/S Jackson S. WPCP to Aboothlacoosta Cr.)	TBD	TBD	TBD	TBD	TBD
Turkey Creek (Headwaters to Yellow River)	TBD	TBD	TBD	TBD	TBD
Turnpike Creek (Hwy 280 to Sugar Creek)	TBD	TBD	TBD	TBD	TBD
Tussahaw Creek (Wolf Creek to Lake Jackson)	TBD	TBD	TBD	TBD	TBD
Walnut Creek (Headwaters to Ocmulgee River)	TBD	TBD	TBD	TBD	TBD
Watson Creek (Headwaters to Yellow River)	TBD	TBD	TBD	TBD	TBD

Stream/Segment	Most Significant Impact(s)	Loading from Point Sources (counts/30 days)	Non-point Sources		Overall Loading (counts/30 days)
			Loading from Other Direct Sources (counts/30 days)	Loading from Surface Runoff (counts/30 days)	
Wise Creek (Headwaters to Kinnard Creek)	TBD	TBD	TBD	TBD	TBD
Yellow River (Big Haynes Creek to Jackson Lake)	TBD	TBD	TBD	TBD	TBD
Yellow River (Hwy 124 to Big Haynes Creek)	TBD	TBD	TBD	TBD	TBD
Yellow River (Sweetwater Creek to Hwy 124)	TBD	TBD	TBD	TBD	TBD
Yellow Water Creek (1 mile d/s Stark Road)	TBD	TBD	TBD	TBD	TBD
Lake Jackson (Newton, Butts, and Jasper Counties)	TBD	TBD	TBD	TBD	TBD

TBD = To Be Determined

Table 11 Possible Load Reduction Scenarios for the Ocmulgee River Basin

Stream/Segment	Reduction from Point Sources (percentage)	Non-point Sources		Overall Reduction (percentage)
		Reduction from Other Direct Sources (percentage)	Reduction from Surface Runoff (percentage)	
Alcovy River (Cedar Creek to Bay Creek)	TBD	TBD	TBD	TBD
Alligator Creek (Batson Creek to Lime Sink Creek)	TBD	TBD	TBD	TBD
Almand Branch (Tanyard Branch to Snapping Shoals)	TBD	TBD	TBD	TBD
Bay Creek (Headwaters to Beaver Creek)	TBD	TBD	TBD	TBD
Beaver Ruin Creek (Gwinnett County)	TBD	TBD	TBD	TBD
Big Cotton Indian Cr. (Panther Creek to Brush Creek)	TBD	TBD	TBD	TBD
Big Flat Creek (Headwaters to Flat Creek)	TBD	TBD	TBD	TBD
Big Haynes Creek (Brushy Creek to Little Panther Creek)	TBD	TBD	TBD	TBD
Big Haynes Creek (Headwaters to Brushy Creek)	TBD	TBD	TBD	TBD
Big Haynes Creek (Little Haynes Creek to Yellow River)	TBD	TBD	TBD	TBD
Big Indian Creek (Mossy Creek to Ocmulgee River)	TBD	TBD	TBD	TBD
Big Sandy Creek (Aboothlacoosta Creek to Ocmulgee River)	TBD	TBD	TBD	TBD
Bromolow Creek (Headwaters to Beaver Ruin Creek)	TBD	TBD	TBD	TBD
Cabin Creek (Headwaters Griffin to Towaliga River)	TBD	TBD	TBD	TBD

Stream/Segment	Reduction from Point Sources (percentage)	Non-point Sources		Overall Reduction (percentage)
		Reduction from Other Direct Sources (percentage)	Reduction from Surface Runoff (percentage)	
Camp Creek (Headwaters to Jackson Creek)	TBD	TBD	TBD	TBD
Cedar Creek (Headwaters to Alcovy River)	TBD	TBD	TBD	TBD
Cobbs Creek (Headwaters to Shoal Creek)	0.0	86.9	93.2	93.0
Conley Creek (Headwaters to South River)	0.0	40.8	67.4	66.7
Doless Creek (Headwaters to Doolittle Creek)	0.0	71.9	94.2	94.6
Doolittle Creek (Headwaters to South River)	0.0	61.3	90.1	89.8
Falling Creek (Little Falling Creek to Ocmulgee River)	TBD	TBD	TBD	TBD
Honey Creek (Headwaters to South River)	15.0	62.0	93.1	77.6
Hopkins Creek (Headwaters to Alcovy River)	TBD	TBD	TBD	TBD
House Creek (Ball Creek to Little House Creek)	TBD	TBD	TBD	TBD
Intrenchment Creek (Headwaters to South River)	0.0	99.9	92.8	98.6
Jacks Creek (Headwaters to Yellow River)	TBD	TBD	TBD	TBD
Jackson Creek (Gwinnett County)	TBD	TBD	TBD	TBD
Little Haynes Creek (Hwy 20 to Big Haynes Creek)	TBD	TBD	TBD	TBD
Little Stone Mountain Creek (Headwaters to Stone Mountain Lake)	TBD	TBD	TBD	TBD
Little Suwanee Creek (Tributary to Yellow River)	TBD	TBD	TBD	TBD

Stream/Segment	Reduction from Point Sources (percentage)	Non-point Sources		Overall Reduction (percentage)
		Reduction from Other Direct Sources (percentage)	Reduction from Surface Runoff (percentage)	
McClain Branch (Headwaters to Honey Creek)	15.0	73.8	92.8	90.8
No Business Creek (Headwaters to Norris Lake)	TBD	TBD	TBD	TBD
North Branch South River (Atlanta)	0.0	96.8	73.6	96.7
Ocmulgee River (Beaverdam Creek to Walnut Creek)	TBD	TBD	TBD	TBD
Ocmulgee River (Sandy Run Creek to Big Indian Creek)	TBD	TBD	TBD	TBD
Ocmulgee River (Tobesofkee Creek to Echeconnee Creek)	TBD	TBD	TBD	TBD
Pew Creek (Gwinnett County)	TBD	TBD	TBD	TBD
Rocky Creek (1 mile u/s Rocky Cr. Rd. to Tobesofkee Cr.)	TBD	TBD	TBD	TBD
Shetley Creek (Headwaters to Bromolow Creek)	TBD	TBD	TBD	TBD
Shoal Creek (Headwaters to Alcovy River)	TBD	TBD	TBD	TBD
Shoal Creek (Headwaters to South River)	0.0	73.1	97.6	96.9
Snapfinger Creek (Dekalb County)	0.0	66.9	82.4	81.4
Snapping Shoals Creek (Almand Branch to South River)	TBD	TBD	TBD	TBD
South River (Atlanta to Flakes Mill Road)	TBD	TBD	TBD	TBD
South River (Flakes Mill Road to Pole Bridge Creek)	TBD	TBD	TBD	TBD
South River (Hwy 20 to Snapping Shoals Creek)	TBD	TBD	TBD	TBD

Stream/Segment	Reduction from Point Sources (percentage)	Non-point Sources		Overall Reduction (percentage)
		Reduction from Other Direct Sources (percentage)	Reduction from Surface Runoff (percentage)	
South River (Pole Bridge Creek to Hwy 20)	TBD	TBD	TBD	TBD
South River (Snapping Shoals to Jackson Lake)	TBD	TBD	TBD	TBD
Stone Mountain Creek (Headwaters to Stone Mountain Lake)	TBD	TBD	TBD	TBD
Sugar Creek (U/s Memorial Drive to South River)	0.0	88.4	93.6	93.4
Sweetwater Creek (Lee Daniel Creek to Yellow River)	TBD	TBD	TBD	TBD
Swift Creek (Headwaters to Yellow River)	TBD	TBD	TBD	TBD
Tobesofkee Creek (Cole Creek to Todd Creek)	TBD	TBD	TBD	TBD
Tobesofkee Creek (Lake Tobesofkee to Rocky Creek)	TBD	TBD	TBD	TBD
Town Branch (D/S Jackson S. WPCP to Aboothlacoosta Cr.)	TBD	TBD	TBD	TBD
Turkey Creek (Headwaters to Yellow River)	TBD	TBD	TBD	TBD
Turnpike Creek (Hwy 280 to Sugar Creek)	TBD	TBD	TBD	TBD
Tussahaw Creek (Wolf Creek to Lake Jackson)	TBD	TBD	TBD	TBD
Walnut Creek (Headwaters to Ocmulgee River)	TBD	TBD	TBD	TBD
Watson Creek (Headwaters to Yellow River)	TBD	TBD	TBD	TBD
Wise Creek (Headwaters to Kinnard Creek)	TBD	TBD	TBD	TBD
Yellow River (Big Haynes Creek to Jackson Lake)	TBD	TBD	TBD	TBD

Stream/Segment	Reduction from Point Sources (percentage)	Non-point Sources		Overall Reduction (percentage)
		Reduction from Other Direct Sources (percentage)	Reduction from Surface Runoff (percentage)	
Yellow River (Hwy 124 to Big Haynes Creek)	TBD	TBD	TBD	TBD
Yellow River (Sweetwater Creek to Hwy 124)	TBD	TBD	TBD	TBD
Yellow Water Creek (1 mile d/s Stark Road)	TBD	TBD	TBD	TBD
Lake Jackson (Newton, Butts, and Jasper Counties)	TBD	TBD	TBD	TBD

TBD = To Be Determined

APPENDIX A:

WATER QUALITY MONITORING DATA

Ocmulgee River Basin

Stream/Segment	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)
Alcovy River (Cedar Creek to Bay Creek)	02/12/1999 02/16/1999 02/22/1999 03/05/1999	70 20 20 170	47	04/08/1999 04/13/1999 04/20/1999 04/29/1999	230 60 20 110	74	06/10/1999 06/17/1999 06/24/1999 07/08/1999	130 1700 140 700	384	09/09/1999 09/23/1999 09/30/1999 10/07/1999	330 790 130 490	359
Alligator Creek (Batson Creek to Lime Sink Creek)	04/06/1999 04/15/1999 04/22/1999 04/28/1999	80 490 1700 4900	756	05/20/1999 05/27/1999 06/10/1999 06/17/1999	490 460 490 1700	658	07/29/1999	490		08/12/1999	490	
Almand Branch (Tanyard Branch to Snapping Shoals)	02/11/1999 02/17/1999 02/23/1999 03/03/1999	790 20 20 460	110	04/07/1999 04/12/1999 04/19/1999 04/28/1999	230 50 130 170	126	06/09/1999 06/16/1999 06/23/1999 07/07/1999	230 1300 490 7900	1037	09/08/1999 09/22/1999 09/29/1999 10/06/1999	80 170 11000 130	373
Bay Creek (Headwaters to Beaver Creek)	01/19/1999 01/27/1999 02/02/1999 02/18/1999	2400 92000 >24000 92000	26424	04/01/1999 04/14/1999 04/21/1999 04/28/1999	1300 3300 3500 4900	2929	06/23/1999 06/30/1999 07/14/1999 07/21/1999	92000 5400 >24000 17000	21218	09/22/1999 09/29/1999 10/05/1999 10/20/1999	14950 230 1100 10000	2480
Beaver Ruin Creek (Gwinnett County)												
Big Cotton Indian Cr. (Panther Creek to Brush Creek)	02/11/1999 02/17/1999 02/23/1999 03/03/1999	220 220 220 280	234	04/07/1999 04/12/1999 04/19/1999 04/28/1999	170 330 490 1300	435	06/09/1999 06/16/1999 06/23/1999 07/07/1999	490 790 330 460	492	09/08/1999 09/22/1999 09/29/1999 10/06/1999	270 3500 >24000 490	1826
Big Flat Creek (Headwaters to Flat Creek)	02/12/1999 02/16/1999 02/22/1999	170 80 260 80	130	04/08/1999 04/13/1999 04/20/1999 04/29/1999	4100 790 460 7000	1797	06/10/1999 06/17/1999 06/24/1999 07/08/1999	330 490 5400 3300	1303	09/09/1999 09/23/1999 09/30/1999 10/07/1999	1300 340 330 2300	761
Big Haynes Creek (Brushy Creek to Little Panther Creek)	2/12/1999 2/16/1999 2/22/1999 3/05/1999	230 70 330 220	185	6/10/1999 6/17/1999 6/24/1999 07/08/1999	270 490 60 1100	306	04/08/1999 04/13/1999 04/20/1999	130 80 330		09/09/1999 09/30/1999 10/07/1999	170 80 130	
Big Haynes Creek (Headwaters to Brushy Creek)												
Big Haynes Creek (Little Haynes Creek to Yellow River)												
Big Indian Creek (Mossy Creek to Ocmulgee River)	01/19/1999 01/27/1999 02/02/1999 02/18/1999	20 230 1700 180	194	04/01/1999 04/14/1999 04/21/1999 04/28/1999	130 50 50 40	60	06/23/1999 06/30/1999 07/14/1999 07/21/1999	130 940 1700 65	341	09/22/1999 09/29/1999 10/05/1999 10/20/1999	170 110 50 50	83
Big Sandy Creek (Aboothlacoosta Creek to Ocmulgee River)	01/21/1999 01/26/1999 02/04/1999 04/16/1999	70 130 330 490	196	03/30/1999 04/13/1999 04/20/1999 04/27/1999	20 80 50 140	58	06/22/1999 06/29/1999 07/13/1999 07/20/1999	230 2400 170 130	332	09/21/1999 29/28/1999 10/06/1999 10/19/1999	330 210 230 280	258
Bromolow Creek (Headwaters to Beaver Ruin Creek)	03/09/1999 03/15/1999 03/18/1999 03/24/1999	<20 130 20 170	55	05/03/1999 05/12/1999 05/18/1999 06/02/1999	330 230 50 130	149	07/06/1999 07/19/1999 07/22/1999 07/28/1999	3500 220 9200 1100	1671	11/01/1999 11/04/1999 11/15/1999 11/18/1999	220 1300 130 130	264

Table A1 – Water Quality Monitoring Data, Ocmulgee River Basin

Stream/Segment	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)
Cabin Creek (Headwaters Griffin to Towaliga River)	02/25/1999	40	133	04/06/1999	110	305	06/08/1999	1300	656	09/07/1999	490	982
	03/01/1999	170		04/14/1999	1400		06/15/1999	940		09/21/1999	790	
	03/08/1999	140		04/21/1999	330		06/22/1999	460		09/28/1999	490	
	03/11/1999	330		04/27/1999	170		07/06/1999	330		10/05/1999	4900	
Camp Creek (Headwaters to Jackson Creek)	03/09/1999	790	237	03/03/1999	130	229	07/06/1999	460	465	11/01/1999	170	125
	03/15/1999	330		03/12/1999	330		07/19/1999	490		11/04/1999	330	
	03/18/1999	110		03/18/1999	140		07/22/1999	330		11/15/1999	220	
	03/24/1999	110		06/02/1999	460		07/28/1999	630		11/18/1999	20	
Cedar Creek (Headwaters to Alcovy River)	03/09/1999	80	81	05/03/1999	80	80	07/06/1999	230	222	11/01/1999	110	53
	03/15/1999	40		05/12/1999	500		07/19/1999	330		11/04/1999	50	
	03/18/1999	170		05/18/1999	50		07/22/1999	140		11/15/1999	70	
	03/24/1999	80		06/02/1999	20		07/28/1999	230		11/18/1999	<20	
Cobbs Creek (Headwaters to Shoal Creek)	03/10/1999	<20	407	05/04/1999	170	979	07/07/1999	35000	2029	11/02/1999	16000	350
	03/16/1999	16000		05/13/1999	460		07/20/1999	1700		11/08/1999	90	
	03/22/1999	260		05/17/1999	490		07/26/1999	700		11/16/1999	130	
	03/25/1999	330		05/19/1999	>24000		0729/1999	460		11/22/1999	80	
Conley Creek (Headwaters to South River)	03/10/1999	<20	119	05/04/1999	490	503	07/07/1999	490	411	11/02/1999	5400	300
	03/16/1999	230		05/13/1999	70		07/20/1999	170		11/08/1999	70	
	03/22/1999	90		05/17/1999	1700		07/26/1999	310		11/16/1999	430	
	03/25/1999	490		05/19/1999	1100		07/29/1999	1100		11/22/1999	50	
Doless Creek (Headwaters to Dolittle Creek)	03/10/1999	<20	182	05/04/1999	790	6901						
	03/16/1999	<20		05/13/1999	92000							
	03/22/1999	3500		05/17/1999	>24000							
	03/25/1999	790		05/19/1999	1300							
Doolittle Creek (Headwaters to South River)	07/07/1999	1700	625	11/02/1999	5400	221						
	07/20/1999	1700		11/08/1999	110							
	07/26/1999	230		11/16/1999	80							
	07/29/1999	230		11/22/1999	50							
Falling Creek (Little Falling Creek to Ocmulgee River)	01/21/1999	490	153	03/30/1999	230	114	06/22/1999	130	223	09/21/1999	80	241
	01/26/1999	130		04/13/1999	80		06/29/1999	230		09/28/1999	1300	
	02/04/1999	50		04/20/1999	70		07/13/1999	170		10/06/1999	230	
	02/16/1999	170		04/27/1999	130		07/20/1999	490		10/19/1999	140	
Honey Creek (Headwaters to South River)	02/25/1999	230	253	04/06/1999	330	333	06/08/1999	490	409	09/07/1999	490	742
	03/01/1999	1300		04/14/1999	490		06/15/1999	220		09/21/1999	330	
	03/08/1999	80		04/21/1999	230		06/22/1999	330		09/28/1999	11000	
	03/11/1999	170		04/27/1999	330		07/06/1999	790		10/05/1999	170	
Hopkins Creek (Headwaters to Alcovy River)	03/09/1999	490	79	05/03/1999	80	288	07/06/1999	490	259	11/01/1999	<20	39
	03/15/1999	50		05/12/1999	790		07/19/1999	170		11/04/1999	20	
	03/18/1999	<20		05/18/1999	330		07/22/1999	490		11/15/1999	50	
	03/24/199	80		06/02/1999	330		07/28/1999	110		11/18/1999	110	
House Creek (Ball Creek to Little House Creek)	04/06/1999	460	155	07/29/1999	130	402	11/18/1999	20				
	04/15/1999	230		08/12/1999	1100							
	04/22/199	20		08/19/1999	130							
	04/28/1999	270		08/26/1999	1400							

Table A1 – Water Quality Monitoring Data, Ocmulgee River Basin

Stream/Segment	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)
Intrenchment Creek (Headwaters to South River)	03/10/1999	<20	114	05/04/1999	70	915	07/07/1999	>24000	2293	11/02/1999	>24000	485
	03/16/1999	<20		05/13/1999	2200		07/20/1999	>24000		11/08/1999	330	
	03/22/1999	330		05/17/1999	1300		07/26/1999	<20		11/16/1999	140	
	03/25/1999	1300		05/19/1999	3500		07/29/1999	2400		11/22/1999	50	
Jacks Creek (Headwaters to Yellow River)	03/11/1999	80	88	05/06/1999	>24000	3137	07/08/1999	2400	1218	11/03/1999	940	401
	03/17/1999	460		05/17/1999	1100		07/21/1999	1700		11/09/1999	230	
	03/23/1999	20		05/20/1999	1100		07/27/1999	490		11/17/1999	460	
	04/08/1999	80		06/03/1999	3500		08/02/1999	1100		11/23/1999	260	
Jackson Creek (Gwinnett County)	03/09/1999	1700	161	05/03/1999	170	151	07/06/1999	490	535	11/01/1999	230	181
	03/15/1999	60		05/12/1999	340		07/19/1999	2200		11/04/1999	700	
	03/18/1999	<20		05/18/1999	130		07/22/1999	330		11/15/1999	60	
	03/24/1999	330		06/02/1999	70		07/28/1999	230		11/18/1999	110	
Little Haynes Creek (Hwy 20 to Big Haynes Creek)	02/12/1999	220	70	04/08/1999	230	252	07/10/1999	130	252	09/09/1999	130	409
	02/16/1999	80		04/13/199	130		07/17/1999	1300		09/23/1999	2800	
	02/22/1999	20		04/20/1999	170		07/24/1999	80		09/30/1999	700	
	03/05/1999	70		04/29/1999	790		08/08/1999	700		10/07/1999	110	
Little Stone Mountain Creek (Headwaters to Stone Mountain Lake)	03/11/1999	130	105	05/06/1999	790	708	0708/1999	330	446	11/03/1999	790	292
	03/17/1999	80		05/17/1999	130		0721/1999	490		11/09/1999	490	
	03/23/1999	70		05/20/1999	790		0727/1999	310		11/17/1999	110	
	04/08/1999	170		06/03/1999	3100		08/02/1999	790		11/23/1999	170	
Little Suwannee Creek (Tributary to Yellow River)	03/09/1999	2400	182	05/03/1999	330	911	07/06/1999	310	1451	11/01/1999	490	500
	03/15/1999	60		05/12/1999	490		07/19/1999	1700		11/04/1999	490	
	03/18/1999	110		05/18/1999	790		07/22/1999	2400		11/15/1999	330	
	03/24/1999	70		06/02/1999	5400		07/28/1999	3500		11/18/1999	790	
McClain Branch (Headwaters to Honey Creek)	03/10/1999	<20	759	05/04/1999	230	374	07/07/1999	700	633	11/02/1999	5400	548
	03/16/1999	2200		05/13/1999	220		07/20/1999	330		11/08/1999	330	
	03/22/1999	54000		05/17/1999	490		07/26/1999	1100		11/16/1999	230	
	03/25/1999	140		05/19/1999	790		07/29/1999	630		11/22/1999	220	
No Business Creek (Headwaters to Norris Lake)	03/11/1999	140	82	05/06/1999	16000	349	07/08/1999	80	224	11/03/1999	80	72
	03/17/1999	50		05/17/1999	330		07/21/1999	1100		11/09/1999	170	
	03/23/1999	20		05/20/1999	20		07/27/1999	130		11/17/1999	40	
	04/08/1999	330		06/03/1999	140		08/02/1999	220		11/23/1999	50	
North Branch South River (Atlanta)												
Ocmulgee River (Beaverdam Creek to Walnut Creek)	01/20/1999	20	123	03/31/1999	20	34	06/24/1999	50	203	09/23/1999	330	51
	01/28/1999	50		04/15/1999	80		07/01/1999	330		09/30/1999	<20	
	02/03/1999	700		04/22/1999	40		07/15/1999	210		10/07/1999	<20	
	02/17/1999	330		04/29/1999	20		07/22/1999	490		10/21/1999	50	
Ocmulgee River (Sandy Run Creek to Big Indian Creek)	01/19/1999	20	169	04/01/1999	130	57	06/23/1999	40	267	09/22/1999	80	89
	01/27/1999	490		04/14/1999	50		06/30/1999	330		09/29/1999	80	
	02/02/1999	490		04/21/1999	<20		07/14/1999	790		10/05/1999	490	
	02/18/1999	170		04/28/1999	80		07/21/1999	490		10/20/1999	<20	
Ocmulgee River (Tobesofkee Creek to Echeconnee Creek)	01/20/1999	20	133	03/31/1999	50	30	06/24/1999	230	306	09/23/1999	<20	85
	01/28/1999	110		04/15/1999	40		07/01/1999	170		09/30/1999	140	
	02/03/1999	1300		04/22/1999	20		07/15/1999	490		10/07/1999	230	
	02/17/1999	110		04/29/1999	<20		07/22/1999	460		10/21/1999	80	

Table A1 – Water Quality Monitoring Data, Ocmulgee River Basin

Stream/Segment	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)
Pew Creek (Gwinnett County)	03/09/1999	130	55	05/03/1999	40	149	07/06/1999	490	557	11/01/1999	490	289
	03/15/1999	170		05/12/1999	490		07/19/1999	330		11/04/1999	330	
	03/18/1999	<20		05/18/1999	110		07/22/1999	3500		11/15/1999	330	
	03/24/1999	20		06/02/1999	230		07/28/1999	170		11/18/1999	130	
Rocky Creek (1 mile u/s Rocky Cr. Rd. to Tobesofkee Cr.)												
Shetley Creek (Headwaters to Bromolow Creek)	03/09/1999	490	230	05/03/1999	110	582	06/06/1999	2400	1955	11/01/1999	490	719
	03/15/1999	170		05/12/1999	4300		06/19/1999	790		11/04/1999	3500	
	03/18/1999	130		05/18/1999	220		06/22/1999	2200		11/15/1999	1400	
	03/24/1999	260		06/02/1999	1100		06/28/1999	3500		11/18/1999	110	
Shoal Creek (Headwaters to Alcovy River)	03/09/1999	1100	401	05/03/1999	330	337	07/06/1999	2400	480	11/01/1999	40	227
	03/15/1999	130		05/12/1999	1300		07/19/1999	20		11/04/1999	790	
	03/18/1999	790		05/18/1999	230		07/22/1999	1400		11/15/1999	170	
	03/24/1999	230		06/02/1999	130		07/28/1999	790		11/18/1999	490	
Shoal Creek (Headwaters to South River)	03/10/1999	<20	636	05/04/1999	2400	1931	06/07/1999	9200	2929	11/02/1999	9200	5630
	03/16/1999	5400		05/13/1999	460		06/20/1999	7900		11/08/1999	3500	
	03/22/1999	2400		05/17/1999	360		06/26/1999	2200		11/16/1999	>24000	
	03/25/1999	630		05/19/1999	35000		06/29/1999	460		11/22/1999	1300	
Snapfinger Creek (Dekalb County)	02/11/1999	1300	302	04/07/1999	330	708	06/09/1999	110	1102	09/08/1999	330	825
	02/17/1999	170		04/12/1999	70		06/16/1999	330		09/22/1999	260	
	02/23/1999	220		04/19/1999	310		06/23/1999	700		09/29/1999	11000	
	03/03/1999	170		04/28/1999	35000		07/07/1999	58000		10/06/1999	490	
Snapping Shoals Creek (Almand Branch to South River)	03/10/1999	<20	142	05/04/1999	790	1026	07/07/1999	4600	751	11/08/1999	110	61
	03/16/1999	170		05/13/1999	490		07/20/1999	300		11/16/1999	50	
	03/22/1999	110		05/17/1999	1300		07/26/1999	330		11/22/1999	130	
	03/25/1999	1100		05/19/1999	2200		07/29/1999	700		11/29/1999	<20	
South River (Atlanta to Flakes Mill Road)	02/11/1999	1100	231	04/07/1999	330	1647	06/09/1999	460	5438	09/08/1999	1700	4440
	02/17/1999	170		04/12/1999	490		06/16/1999	24000		09/22/1999	9200	
	02/23/1999	90		04/19/1999	1300		06/23/1999	330		09/29/1999	5400	
	03/03/1999	170		04/28/1999	35000		07/07/1999	240000		10/06/1999	4600	
South River (Flakes Mill Road to Pole Bridge Creek)	02/11/1999	2200	578	04/07/1999	130	752	06/09/1999	330	652	09/08/1999	110	1207
	02/17/1999	230		04/12/1999	130		06/16/1999	230		09/22/1999	3500	
	02/23/1999	1700		04/19/1999	790		06/23/1999	170		09/29/1999	>24000	
	03/03/1999	130		04/28/1999	24000		07/07/1999	14000		10/06/1999	230	
South River (Hwy 20 to Snapping Shoals Creek)	01/07/1999	230	199	04/06/1999	80	330	06/08/1999	220	164	09/07/1999	170	584
	01/13/1999	310		04/14/1999	1100		06/15/1999	110		09/21/1999	110	
	01/20/1999	20		04/21/1999	790		06/22/1999	130		09/28/1999	790	
	02/04/1999	1100		04/27/1999	170		07/06/1999	230		10/05/1999	790	
South River (Pole Bridge Creek to Hwy 20)	02/11/1999	4900	152	04/07/1999	70	416	06/09/1999	60	345	09/08/1999	170	1270
	02/17/1999	110		04/12/1999	490		06/16/1999	790		09/22/1999	490	
	02/23/1999	<20		04/19/1999	1100		06/23/1999	130		09/29/1999	>24000	
	03/03/1999	50		04/28/1999	790		07/07/1999	2300		10/06/1999	1300	
South River (Snapping Shoals to Jackson Lake)	01/04/1999	20	184	05/06/1999	640	198.4	09/03/1999	790	411.8	11/19/1999	80	80.6
	01/21/1999	110		05/11/1999	110		09/15/1999	70		11/22/1999	20	
	01/25/1999	213		05/18/1999	20		09/22/1999	40		12/08/1999	80	
	02/03/1999	1700		06/03/1999	1100		09/30/1999	13000		12/15/1999	330	

Table A1 – Water Quality Monitoring Data, Ocmulgee River Basin

Stream/Segment	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)
Stone Mountain Creek (Headwaters to Stone Mountain Lake)	03/11/1999	230	63	05/06/1999	210	373	07/08/1999	230	307	11/03/1999	490	70
	03/17/1999	70		05/17/1999	80		07/21/1999	70		11/09/1999	20	
	03/23/1999	20		05/20/1999	330		07/27/1999	790		11/17/1999	50	
	04/08/1999	50		06/03/1999	3500		08/02/1999	700		11/23/1999	50	
Sugar Creek (U/s Memorial Drive to South River)	02/11/1999	1300	570	04/07/1999	330	2024	06/09/1999	790	1032	09/08/1999	330	1519
	02/17/199	790		04/12/1999	700		06/16/1999	790		09/22/1999	1300	
	02/23/1999	130		04/19/1999	790		06/23/1999	790		09/29/1999	5400	
	03/03/1999	790		04/28/1999	92000		07/07/1999	2300		10/06/1999	2300	
Sweetwater Creek (Lee Daniel Creek to Yellow River)	02/12/1999	160	142	04/08/1999	170	224	06/10/1999	220	955	09/09/1999	460	460
	02/16/1999	790		04/13/1999	170		06/17/1999	11000		09/23/1999	220	
	02/22/1999	40		04/20/1999	110		06/24/1999	700		09/30/1999	490	
	03/05/1999	80		04/29/1999	790		07/08/1999	490		10/07/1999	900	
Swift Creek (Headwaters to Yellow River)	03/11/1999	790	358	05/06/1999	16000	1920	07/08/1999	490	657	11/03/1999	1100	276
	03/17/1999	790		05/17/1999	730		07/21/1999	3500		11/09/1999	110	
	03/23/1999	80		05/20/1999	230		07/27/1999	330		11/17/1999	210	
	04/08/1999	330		06/03/1999	>24000		08/02/1999	330		11/23/1999	230	
Tobesofkee Creek (Cole Creek to Todd Creek)	01/21/1999	20	317	03/30/1999	90	85	06/22/1999	460	1370	09/21/1999	700	205
	01/26/1999	1300		04/13/1999	50		06/29/1999	9200		09/28/1999	460	
	02/04/1999	790		04/20/1999	50		07/13/1999	170		10/06/1999	110	
	02/16/1999	490		04/27/1999	230		07/20/1999	4900		10/19/1999	50	
Tobesofkee Creek (Lake Tobesofkee to Rocky Creek)	01/20/1999	20	69	03/31/1999	20	50	06/24/1999	270	178	09/23/1999	230	454
	01/28/1999	80		04/15/1999	50		07/01/1999	110		09/30/1999	1400	
	02/03/1999	700		04/22/1999	50		07/15/1999	170		10/07/1999	270	
	02/17/1999	20		04/29/1999	130		07/22/1999	200		10/21/1999	490	
Town Branch (D/S Jackson S. WPCP to Aboothlacoosta Cr.)	01/21/1999	220		03/30/1999	330		07/20/1999	4900				
	01/26/1999	490		04/13/1999	7900		09/21/1999	35000				
	02/16/199	330		04/22/1999	460		10/19/1999	260				
Turkey Creek (Headwaters to Yellow River)	03/11/1999	<20	46	03/06/1999	17000	976	07/08/1999	1700	649	11/03/1999	200	356
	03/17/1999	50		03/17/1999	330		07/21/1999	790		11/09/1999	170	
	03/23/1999	20		03/20/1999	490		07/27/1999	270		11/17/1999	80	
	04/08/1999	230		04/03/1999	330		08/02/1999	490		11/23/1999	490	
Turnpike Creek (Hwy 280 to Sugar Creek)	04/01/1999	6400	441	05/19/1999	160		12/08/1999	20				
	04/08/1999	110		07/28/1999	170		12/15/1999	110				
	04/14/1999	490		08/11/1999	<20							
	04/21/1999	110										
Tussahaw Creek (Wolf Creek to Lake Jackson)	01/07/1999	490	138	04/06/1999	270	340	06/08/1999	330	302	09/07/1999	230	2227
	01/13/1999	220		04/14/1999	460		06/15/1999	230		09/21/1999	5400	
	01/20/1999	20		04/21/1999	220		06/22/1999	330		09/28/1999	11000	
	02/04/1999	170		04/27/1999	490		07/06/1999	330		10/05/1999	1800	
Walnut Creek (Headwaters to Ocmulgee River)	01/20/1999	20	1149	03/31/1999	280	264	06/24/1999	2200	330	09/23/1999	20	159
	01/28/1999	3300		04/15/1999	330		07/01/1999	50		09/30/1999	70	
	02/03/1999	>24000		04/22/1999	230		07/15/1999	490		10/07/1999	3500	
	02/17/1999	1100		04/29/1999	230		07/22/1999	220		10/21/1999	130	
Watson Creek (Headwaters to Yellow River)	03/11/1999	80	40	05/06/1999	>24000	669	07/08/1999	460	611	11/03/1999	490	70
	03/17/1999	<20		05/17/1999	330		07/21/1999	5400		11/09/1999	50	
	03/23/1999	<20		05/20/1999	110		07/27/1999	170		11/17/1999	50	
	04/08/1999	80		06/03/1999	230		08/02/1999	330		11/23/1999	20	

Table A1 – Water Quality Monitoring Data, Ocmulgee River Basin

Stream/Segment	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)	Sample Dates	Fecal Coliform Bacteria (MPN/100 ml.)	Geometric Mean (#/100 ml.)
Wise Creek (Headwaters to Kinnard Creek)	01/21/1999 01/26/1999 02/04/1999 02/16/1999	80 130 80 230	114	03/30/1999 04/13/1999 04/20/1999 04/27/1999	50 460 50 330	140	06/22/1999 06/29/1999 07/13/1999 07/20/1999	330 170 330 490	309	09/21/1999 09/28/1999 10/06/1999 10/19/1999	490 230 2200 50	334
Yellow River (Big Haynes Creek to Jackson Lake)	01/07/1999 01/13/1999 01/20/1999 02/04/1999	940 330 20 790	265	04/06/1999 04/14/1999 04/21/1999 04/27/1999	50 80 220 80	92	06/08/1999 06/15/1999 06/22/1999 07/06/1999	790 330 80 330	288	09/07/1999 09/21/1999 09/28/1999 10/05/1999	1100 490 460 3000	929
Yellow River (Hwy 124 to Big Haynes Creek)												
Yellow River (Sweetwater Creek to Hwy 124)	02/12/1999 02/16/1999 02/22/1999 03/05/1999	170 270 66 50	111	04/08/1999 04/13/1999 04/20/1999 04/29/1999	210 20 230 330	134	06/10/1999 06/17/1999 06/24/1999 07/08/1999	330 11000 170 1100	908	09/09/1999 09/23/1999 09/30/1999 10/07/1999	170 170 310 1300	329
Yellow Water Creek (1 mile d/s Stark Road)	01/21/1999 01/26/1999 02/04/1999 02/16/1999	50 490 790 2200	454	03/30/1999 04/13/1999 04/20/1999 04/27/1999	80 20 50 60	47	06/22/1999 06/29/1999 07/13/1999 07/20/1999	790 9200 790 230	1072	09/21/1999 09/28/1999 10/06/1999 10/19/1999	1300 110 <130 140	226
Lake Jackson ("Newton, Butts, and Jasper Counties")												

APPENDIX B:

MODEL DEVELOPMENT AND CALIBRATION

B.1 Model Selection

The Hydrological Simulation Program Fortran (HSPF) - Version 12.0 was selected to represent the hydrological conditions for the Ocmulgee River Basin. The watershed modeling provided a consistent hydrology and modeling framework for TMDL development in 2001. The Nonpoint Source Model Program (NPSM), a detailed graphical user interface (GUI), was used as the link between the user and HSPF.

B.2 Model Development

The watershed model represents the variability of nonpoint source contributions through dynamic representation of hydrology and land practices. The watershed model includes all point and nonpoint source contributions within the Ocmulgee River Basin. Key components of the watershed modeling included:

- Watershed segmentation
- Meteorological data
- Simulation period
- Land use representation
- Hydrological representation
- USGS Flow Data

B.2.1 Watershed Segmentation

In order to evaluate the sources contributing to an impaired waterbody and to represent the spatial variability of these sources within the watershed model, the contributing drainage area was represented by a series of subwatersheds. These subwatersheds were represented using the Georgia 12-digit watershed data layer. In some situations, the 12-digit data layer required further subdivision for appropriate hydrological connectivity and representation.

Boundaries were constructed so that subwatershed "pour points" coincided, when possible, with water quality monitoring stations or USGS flow gages. Watershed delineation was based on the Rf3 stream coverage and Digital Elevation Model (DEM) data. This discretization allows management and load reduction alternatives to be varied by subwatershed. Initial input for model variables was developed using WCS and the associated spreadsheet tools.

B.2.2 Meteorological Data

An important factor influencing model results is the precipitation data contained in the meteorological data file used in the simulation. The pattern and intensity of rainfall affects the build-up and wash-off of fecal coliform bacteria from the land into the streams, as well as the dilution potential of the stream. Hourly data from weather stations within the boundaries of or in close proximity to the subwatersheds were applied to the watershed model. These data include precipitation, air temperature, dew point temperature, wind speed, cloud cover, evaporation, and solar radiation. These data are used directly, or calculated from the observed data.

Hourly precipitation data for numerous stations in and adjacent to the Ocmulgee River Basin were extracted from the EarthInfo CD set. After review of precipitation data and graphs, 5 precipitation stations were chosen for inclusion. This information was processed and patched, to construct a continuous period of record. The stations used are shown in Table B1. The 5 precipitation stations are shown in Figure B1. There were no data for the Jackson Dam station for the majority of 1997, 1998, and 1999. A distribution was determined from evaluation of regional stations. Annual magnitude was used from a nearby rain gage that is part of the Georgia Environmental Monitoring Network system.

Meteorological data, other than precipitation, was used from two stations in or near to the project study watershed area. The data from these meteorological stations were assigned, using engineering judgment, to each of the 5 precipitation stations. The data from meteorological stations area applied to the precipitation stations are shown in Table B2. The two meteorological stations are shown in Figure B1 as HUSWO and SAMSON sites.

Cloud cover data was incomplete for the period 1996 to 1999. The solution for this missing data was to evaluate the annual total rainfall values for the period of record of the meteorological stations. It was assumed that the cloud cover data from a prior year with a similar annual rainfall value would be representative.

Figure B1 – Location of Precipitation and Meteorological Stations

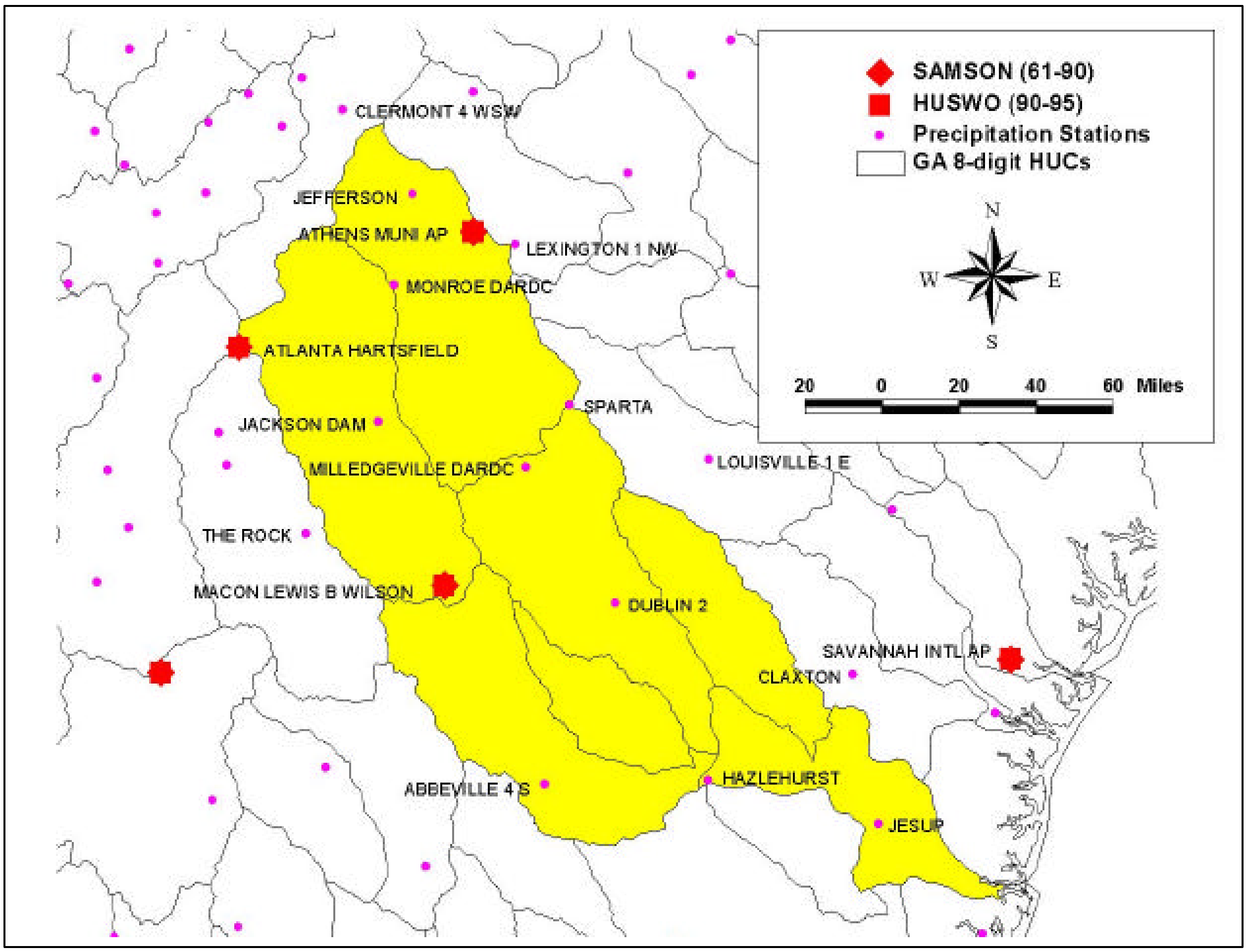


Table B1 - Precipitation Stations and Associated Patching Stations

WDM File Station Number	Description	Station ID	Stations Used to Patch the WDM File Station
01	Abbeville 4 S	GA0010	GA2728, GA2844, GA4204
02	Atlanta Hartsfield	GA0451	GA2578, GA4070, GA5974
11	Macon Lewis B Wilson	GA5443	GA2844, GA5876, GA8657
16	The Rock	GA8657	GA4070, GA5443, GA5974
17	Jackson Dam	GA4623	GA0451, GA4070, GA8657, GA5443, GA5876, GA5974

Table B2 – Meteorological Stations Used at Each Precipitation Station

WDM File Station Number	Description	Station ID	Station Used for Meteorological Data at the WDM File Precipitation Stations
01	Abbeville 4 S	GA0010	GA5443, Macon Lewis B Wilson
02	Atlanta Hartsfield	GA0451	GA0451, Atlanta Hartsfield
11	Macon Lewis B Wilson	GA5443	GA5443, Macon Lewis B Wilson
16	The Rock	GA8657	GA5443, Macon Lewis B Wilson
17	Jackson Dam	GA4623	GA0451, Atlanta Hartsfield

B.2.3 Simulation Period

EPA recommends looking at an extended time period for hydrology calibrations. This is due to the fact that over an extended period, a variety of hydrological conditions will exist, and a model that is calibrated over this time period will have a greater chance of success in predicting future hydrological conditions. The hydrological models were calibrated from October 1, 1994 through December 31, 1999. In 1999, there was a comprehensive water quality data set that was collected for the Ocmulgee River Basin.

B.2.4 Land Use Representation

The watershed model uses land use data as the basis for representing hydrology and nonpoint source loading. Land use categories for modeling were selected based on the USGS Multi-Resolution Landuse Classification (MRLC) data set, and included built-up, forest, cropland, pasture, and wetlands. The USGS data represents conditions in the early to middle 1990's. The modeling categories and their corresponding USGS classifications are presented in Table B3.

The HSPF model requires division of land uses in each subwatershed into separate pervious and impervious land units. For each land use, this division can be made based on typical imperviousness percentages from individual land use categories, such as those used in the Soil Conservation Service's TR-55 method. For modeling purposes, the percent imperviousness of a given land category can be calculated as an area-weighted average of land use classes encompassing the modeling land category.

Table B3 – Land Use Representation

Land Categories Represented in the Model	MRLC Land Use Code	MRLC Land Use Classes	% Impervious
Built-up	21	Low Intensity Residential	19
	22	High Intensity Residential	65
	23	High Intensity Comm./Ind./Trans.	80
	33	Transitional	10
Forest	31	Bare Rock/Sand/Clay	0
	32	Quarries/Strip Mines/Gravel Pits	0
	41	Deciduous Forest	0
	42	Evergreen Forest	0
Forest	43	Mixed Forest	0
	51	Deciduous Shrubland	0
	52	Evergreen Shrubland	0
	53	Mixed Shrubland	0
	71	Grassland/Herbaceous	0
	85	Other Grasses	0
Wetland	91	Woody Wetlands	0
	92	Emergent Herbaceous Wetlands	0
Cropland	61	Planted/Cultivated	0
	82	Row Crops	0
	83	Small Grains	0
	84	Bare Soil	0
Pasture	81	Pasture/Hay	0

B.2.5 Hydrological Representation

Watershed hydrology plays an important role in the determination of nonpoint source flow and ultimately nonpoint source loadings to a waterbody. The watershed model must appropriately represent the spatial and temporal variability of hydrological characteristics within a watershed. Key hydrological characteristics include interception storage capacities, infiltration properties, evaporation and transpiration rates, and watershed slope and roughness. The HSPF modules used to represent watershed hydrology for TMDL development included PWATER (water budget simulation for pervious land units) and IWATER (water budget simulation for impervious land units).

During the hydrologic calibration process, model parameters were adjusted within reasonable constraints until an acceptable agreement was achieved between simulated and observed stream flow. Model parameters adjusted included: evapotranspiration, infiltration, upper and lower zone storage, groundwater storage, recession rates, losses to the deep groundwater system, and interflow discharge.

B.2.6 USGS Flow Data

There are 25 historical USGS flow stations in the Georgia Middle 3 Basins that contained complete flow data from January 1, 1990 through December 31, 1999. Of those 25 historical flow stations, 1 station was used for model calibration and 5 stations were used for model validation (Refer to Table C1 in Appendix C).

B.3 Model Organization

The main division within the modeling schematic for the Ocmulgee River Basin is the 8-digit HUC number. The Ocmulgee River Basin is comprised of 3 HUCs, 03070103 (Upper Ocmulgee), 03070104 (Lower Ocmulgee), and 03070105 (Little Ocmulgee). Within each of these HUCs, individual projects were created that identify and appropriately model the subwatersheds within each HUC. There are 21 projects within the Upper Ocmulgee HUC, 5 projects within the Lower Ocmulgee HUC, and 2 projects within the Little Ocmulgee HUC.

The development of the modeling schematic for each HUC in the Ocmulgee River Basin is provided in Appendix G. The information included for each HUC includes:

- Tables of 303(d) Listed Segments located within each 8-digit HUC for Fecal Coliform and their associated project names,
- Modeling schematic of each 8-digit HUC,
- Location of Projects within each 8-digit HUC,
- Subwatershed ID Numbering for each of the Projects,
- Location of the Active Point Sources that were included within each 8-digit HUC,
- Location of the 1999 Monitoring Stations that were included within each 8-digit HUC,
- Project Summary Sheets.

There is one project summary sheet for each project contained in the 8-digit HUC. These sheets contain all of the information about each of the subwatersheds contained within each individual project.

B.4 Model Calibration

The calibration of the NPSM watershed model involves both hydrology and water quality components. The model must be calibrated to appropriately represent hydrologic response in the watershed before subsequent calibrations and reasonable water quality simulations can be performed.

B.4.1 Hydrologic Calibration

The hydrology calibration of the watershed model involved comparing simulated stream flows to historic stream flow data from a USGS stream gaging station for the same period of time.

Initial values for hydrological variables were taken from an EPA developed default data set. During the calibration process, model parameters were adjusted within reasonable constraints until acceptable agreement was achieved between simulated and observed stream flow. Model parameters adjusted include: evapotranspiration, infiltration, upper and lower zone storage, groundwater storage, recession, losses to the deep groundwater system, and interflow discharge. Measures which can reduce urban contributions include: repair and renovation of leaking sewer collection systems; reduction of sewer overflows and surcharges by use of separate conduit systems for domestic wastewater and stormwater; encouraging households and businesses to connect to public sewer systems and reduce the population using septic systems.

Calibrated models were then subjected to model validation to ensure that generated model streamflows for each of the impaired segments were acceptable. Model generated hydrographs for each of the impaired streams are presented in Appendix D.

Within the Piedmont region (above the GA Fall Line), the hydrological parameters were calibrated using the USGS flow gage 02204070 – South River at Klondike Road, which is located in the Upper Ocmulgee Basin (Refer to Table C1 in Appendix C). Typically, a 10-year calibration is performed on the watershed model, however, in this case only a 5.2-year calibration was performed. This is due to the fact that this area is dominated by combined sewer overflows (CSOs), and data for the CSOs only date back to October 1, 1994. Therefore, the calibration on the hydrological parameters above the GA fall line was from October 1, 1994 to December 21, 1999.

B.4.2 Model Validation

An important step of the modeling process is model validation. Model validation is the process of taking the hydrological parameters that have been calibrated, applying those parameters to other watersheds, and comparing the simulated flow to measured flow from a USGS stream gaging station for the same period of time. Model validation is sometimes called model verification, as essentially you are validating or verifying that hydrological parameters calibrated in one watershed will produce acceptable results in another watershed. It is important that when selecting watersheds to perform validations, those watersheds represent a wide variety of landuses as well as drainage areas. This will help to ensure that the hydrological parameters that were calibrated apply to a wide range of conditions. Every validation was carried over an extended multi-year period.

For the hydrological parameters calibrated above the fall line, validations were performed at 6 other watersheds. Table C1 (Appendix C) summarizes the calibration station and validation stations for above the fall line. For the hydrological parameters calibrated below the fall line, validations were performed at 4 other watersheds. Table C2 (Appendix C) summarizes the calibration station and validation stations for below the fall line.

B.5 Water Quality Calibration

Ocmulgee River Basin data, generated by WCS, was processed through the spreadsheet applications developed by Tetra Tech, Inc. to generate fecal coliform loading data for use as initial input to the NPSM model.

The figures presented in Appendix F show the resulting 30-day geometric mean results for the existing and TMDL conditions for the modeled period. The existing conditions results provided the basis for selection of the 30-day critical conditions period for the TMDL modeling.

B.5.1 Point Sources

For existing conditions, NPDES facilities located in modeled subwatersheds are represented as point sources of constant flow and concentration based on the facility's average flow and effluent fecal coliform concentration as reported on DMRs (see Table 6).

A.5.2 Nonpoint Sources

A number of nonpoint source categories are not associated with land loading processes and are represented as direct, instream source contributions in the model. These may include, but are not limited to, failing septic systems, leaking sewer lines, animals in streams, direct discharge of raw sewage, and undefined sources. All other nonpoint sources involve land loading of fecal coliform bacteria and washoff as a result of storm events. Only a portion of the load from these sources are actually delivered to streams due to the mechanisms of washoff (efficiency), decay, and incorporation into soil (adsorption, absorption, filtering) before being transported to the stream. Therefore, land loading nonpoint sources are represented as indirect contributions to the stream. Buildup, washoff, and die-off rates are dependent on seasonal and hydrologic processes.

Initial input for nonpoint sources of fecal coliform loading in the water quality model was developed using watershed information generated with WCS and the Tetra Tech loading calculation spreadsheets.

B.5.2.1 Wildlife

Fecal coliform loading from wildlife is considered to be uniformly distributed to forest, pasture, cropland, and wetland areas in the modeled subwatersheds. A loading rate of 5.0×10^8 counts/animal/day for deer is based on best professional judgment (BPJ) of EPA. An animal density of 45 animals/square mile is used to account for deer and all other wildlife. The resulting fecal coliform loading is 2.5×10^6 counts/acre/day and is considered background.

B.5.2.2 Land Application of Agricultural Manure

In the water quality model, county livestock populations (see Table 7) are distributed to subwatersheds based on the percentage of agricultural area in each subwatershed classified as pasture/hay. Fecal coliform loading rates were calculated from livestock populations based on manure application rates, literature values for bacteria concentrations in livestock manure, and the following assumptions:

- Fecal content in manure was adjusted to account for die-off due to known treatment/storage methods.
- Manure application rates from the various animal sources vary monthly according to management practices. Hog manure and chicken litter are applied from March through October; beef cattle manure is applied throughout the year; dairy cow manure is applied from February through October as well as in December.
- The fraction of manure available for runoff is dependent on the method of manure application. In the water quality model, the fraction available is estimated based on incorporation into the soil.
- In Georgia, manure is generally not applied to cropland, only pastureland.
- Fecal coliform production rates used in the model are 1.04×10^{11} counts/day/dairy cow, 1.22×10^{10} counts/day/sheep, 1.98×10^8 counts/day/chicken layer, and 2.4×10^8 counts/day/chicken (Metcalf and Eddy, 1991).

Since manure is not applied to cropland in the Ocmulgee River Basin, the only source of fecal coliform bacteria from cropland is from wildlife that deposits feces on the land surface. The in-stream loading from cropland is considered background.

B.5.2.3 Grazing Animals

Cattle spend time grazing on pastureland and deposit feces onto the land. During storm events, a portion of this material containing fecal coliform bacteria is transported to streams. Beef cattle are assumed to spend all their time in pasture. The percentage of feces deposited during grazing time is used to estimate fecal coliform loading rates from pastureland. Because there is no assumed monthly variation in animal access to pastures, the fecal loading rate does not vary significantly throughout the year. Therefore, the loading rate to pastureland from grazing animals used in the model is assumed to be constant. Contributions of fecal coliform from wildlife (as noted in Section B.5.2.1) are also included in these rates.

B.5.2.4 Urban Development

Urban land use represented in the MRLC database includes areas classified as: high intensity commercial, industrial, transportation, low intensity residential, high intensity residential, and transitional. Associated with each of these classifications a percent of the land area that is impervious. A single, area-weighted loading rate from urban areas is used in the model and is based on the percentage of each urban land use type in the watershed and build-up and accumulation rates referenced in Horner (1992). In the water quality calibrated model, this rate varies from 7.5×10^9 to 2.5×10^{10} counts/acre-day and is assumed constant throughout the year.

B.5.2.5 Other Sources

As previously stated, there are a number of nonpoint sources of fecal coliform bacteria that are not associated with land loading and washoff processes. These include animal access to streams, failing septic systems, leaking sewer lines, illicit discharges, and other undefined sources. In each subwatershed, all of these miscellaneous sources have been grouped together and modeled as a point source of constant flow and fecal coliform concentration. The initial baseline values of flow and concentration were estimated using the Tetra Tech, Inc. developed spreadsheets and the following assumptions:

- The load attributed to animals having access to streams is initially based on the beef cow population in the watershed. It was assumed that 50% have access to streams and, of those, 25% defecate in or near the stream banks during a short portion of the day. The resulting percentage of time fecal coliform bacteria is discharged into the streams from grazing cattle is 0.025%. Literature values were used to estimate the fecal coliform bacteria concentration in beef cow manure.

- The initial baseline loads attributable to leaking septic systems is based on an assumed failure rate of 5 percent. This rate was selected based on a survey conducted by EPD that included all counties within the Ocmulgee River Basin watersheds that had septic system failure data.

These flow and concentration variables were adjusted during water quality calibration to alter simulated instream fecal concentrations during dry weather conditions.

B.5.3 Water Quality Calibration Results

During water quality calibration, model parameters were adjusted within reasonable limits until acceptable agreement between simulation output and instream observed data was achieved. Model variables adjusted include:

- Rate of fecal coliform bacteria accumulation

- Maximum storage of fecal coliform bacteria

- Rate of surface runoff that will remove 90% of stored fecal coliform bacteria

- Concentration of fecal coliform bacteria in interflow

- Concentration of fecal coliform bacteria in groundwater

- Concentration of fecal coliform bacteria and rate of flow of “other direct sources” described in Section B.5.2.5

The portion of the each impaired stream segment modeled for each water quality calibration represented the drainage area upstream of the monitoring station. A comparison of simulated and observed daily fecal coliform concentrations at sampling stations in the 303(d) listed streams are presented in Appendix E. Results show that the model adequately simulates peaks in fecal coliform bacteria in response to rainfall events. Often a high observed value is not simulated in the model due to lack of rainfall at the meteorological station as compared to the rainfall occurring in the watershed, or is the result of an unknown source that is not included in the model.

APPENDIX C:

HYDROLOGY CALIBRATIONS

Table C1 - Calibration and Validation Stations for Hydrological Parameters
Above the GA Fall Line (Piedmont)

Station Number	**Station Name**	**Type**	**Drainage Area (acres)**	**Reference WDM station**
02204070	South River at Klondike Road	Calibration	117978	Atlanta Hartsfield
02219000	Apalachee River near Bostwick, GA	Validation	119738	Monroe
02217500	Middle Oconee River near Athens, GA	Validation	252006	Jefferson
02220900	Little River near Eatonton, GA	Validation	174445	Milledgeville
02221525	Murder Creek Below Eatonton, GA	Validation	121690	Milledgeville
02208450	Alcovy River above Covington, GA	Validation	122720	Monroe
02213000	Ocmulgee River at Macon, GA	Validation	1450880	Macon Lewis

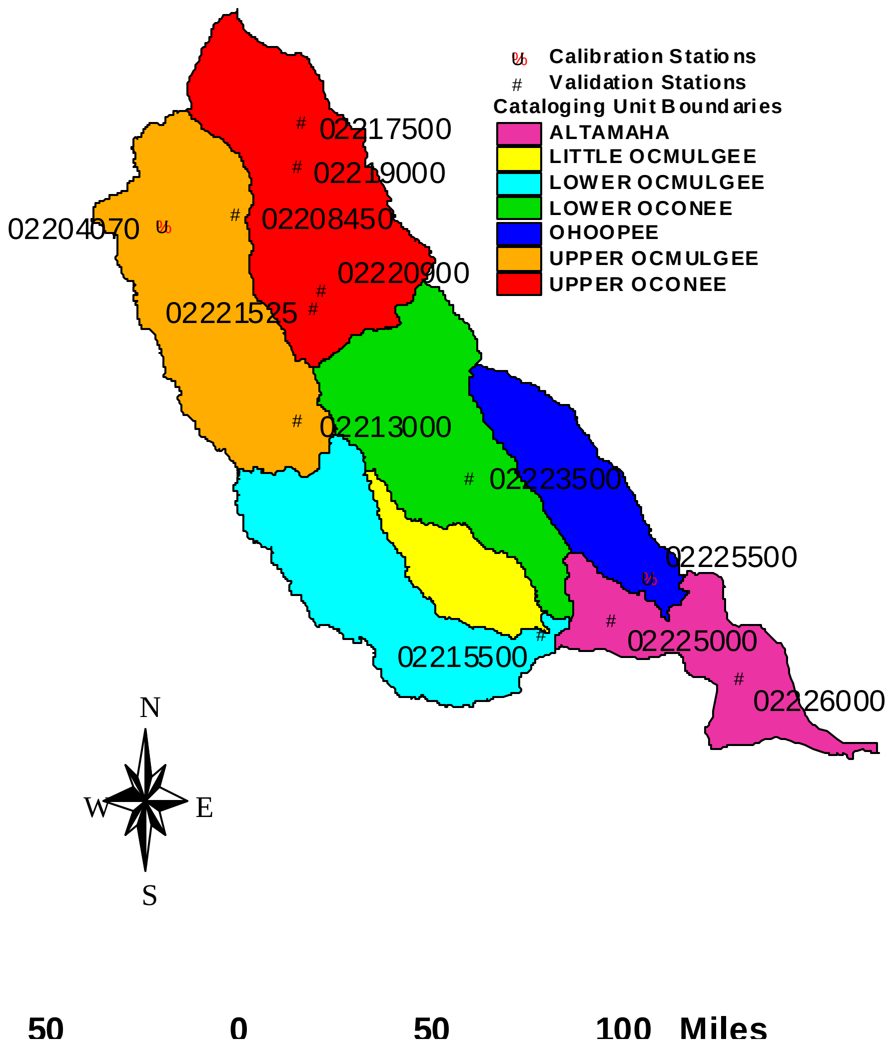


Figure C.1. Location of Hydrology Calibration and Validation Stations

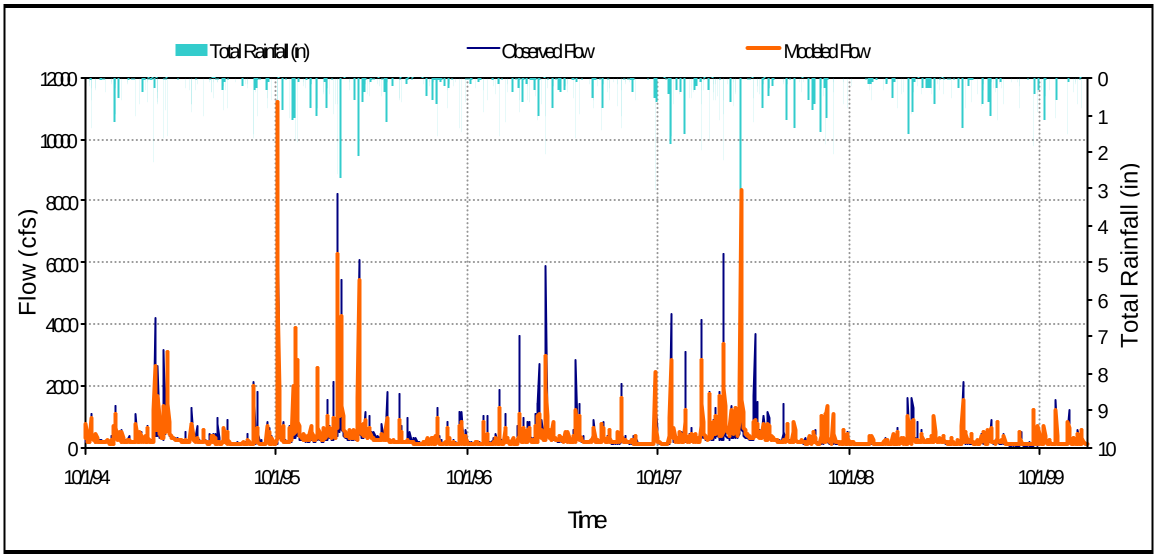


Figure C.2. 5.2-Year Calibration (Daily Flow) at 02204070 – South River at Klondike Road.

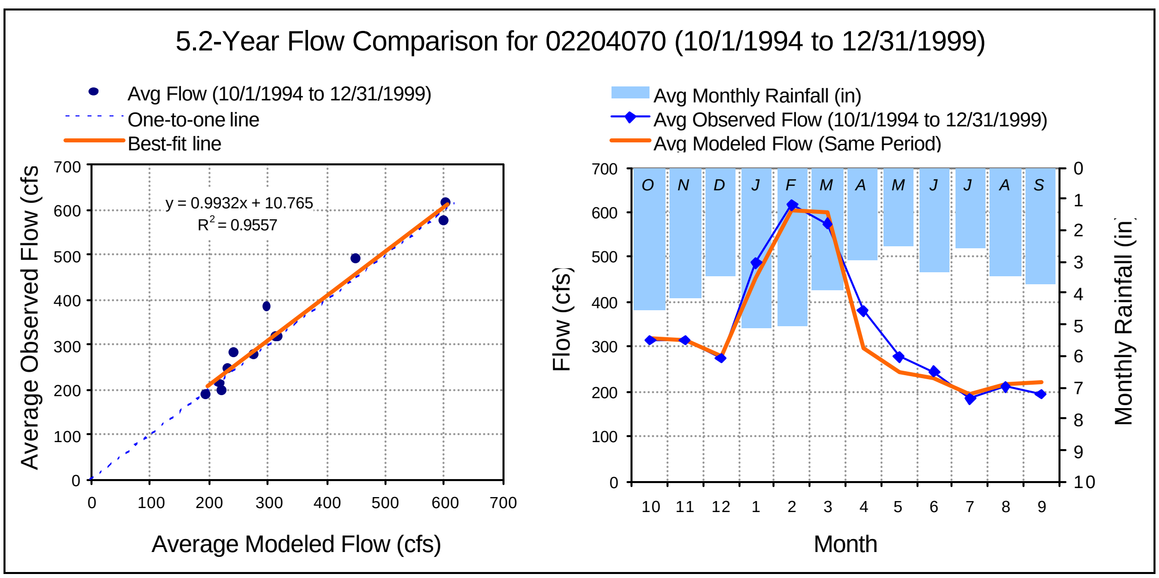


Figure C.3. 5.2-Year Calibration (Monthly Average) at 02204070 – South River at Klondike Road.

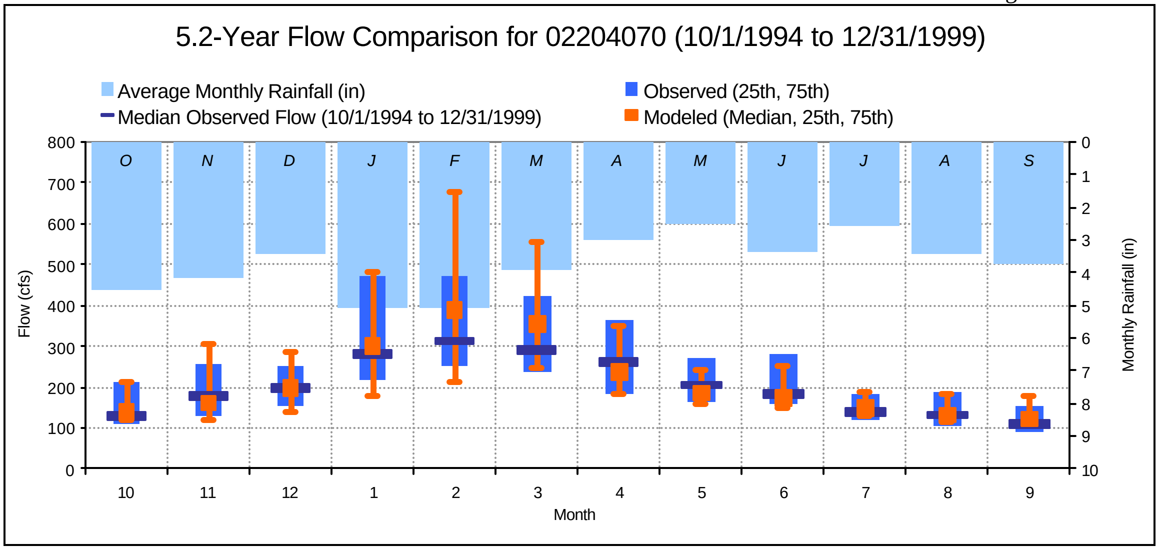


Figure C.4. 5.2-Year Calibration (Monthly Medians) at 02204070 – South River at Klondike Road.

Simulation Name:	02204070	**Simulation Period:**	
		Watershed Area (ac):	117978
Period for Flow Analysis			
Begin Date:	**10/01/94**	**Baseflow PERCENTILE:**	2.5
End Date:	**12/31/99**	*Usually 1%-5%*	
Total Simulated In-stream Flow:	**127.39**	Total Observed In-stream Flow:	**130.44**
Total of highest 10% flows:	**50.64**	Total of Observed highest 10% flows:	**58.20**
Total of lowest 50% flows:	**27.00**	Total of Observed Lowest 50% flows:	**26.39**
Simulated Summer Flow Volume (months 7-9):	**19.70**	Observed Summer Flow Volume (7-9):	**18.35**
Simulated Fall Flow Volume (months 10-12):	**33.85**	Observed Fall Flow Volume (10-12):	**33.63**
Simulated Winter Flow Volume (months 1-3):	**50.13**	Observed Winter Flow Volume (1-3):	**50.76**
Simulated Spring Flow Volume (months 4-6):	**23.70**	Observed Spring Flow Volume (4-6):	**27.71**
Total Simulated Storm Volume:	**85.31**	Total Observed Storm Volume:	**98.06**
Simulated Summer Storm Volume (7-9):	**9.62**	Observed Summer Storm Volume (7-9):	**10.67**
Errors (Simulated-Observed)		*Recommended Criteria*	Last run
Error in total volume:	**-2.40**	10	
Error in 50% lowest flows:	**2.25**	10	
Error in 10% highest flows:	**-14.92**	15	
Seasonal volume error - Summer:	**6.87**	30	
Seasonal volume error - Fall:	**0.65**	30	
Seasonal volume error - Winter:	**-1.24**	30	
Seasonal volume error - Spring:	**-16.90**	30	
Error in storm volumes:	**-14.94**	20	
Error in summer storm volumes:	**-10.85**	50	

Figure C.5. 5.2-Year Calibration Statistics at 02204070 – South River at Klondike Road.

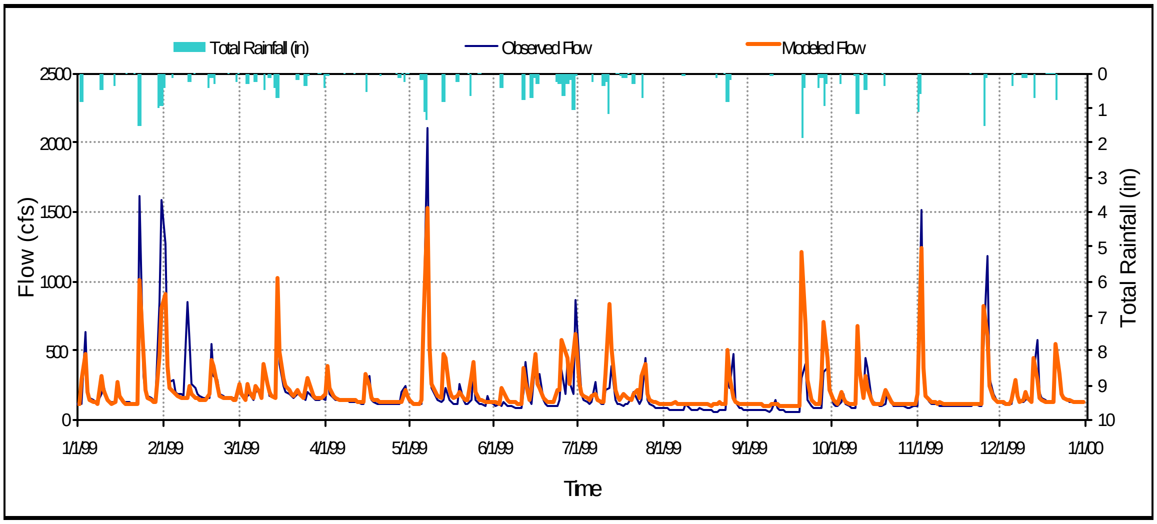


Figure C.6. Calendar Year 1999 (Daily Flow) at 02204070 – South River at Klondike Road.

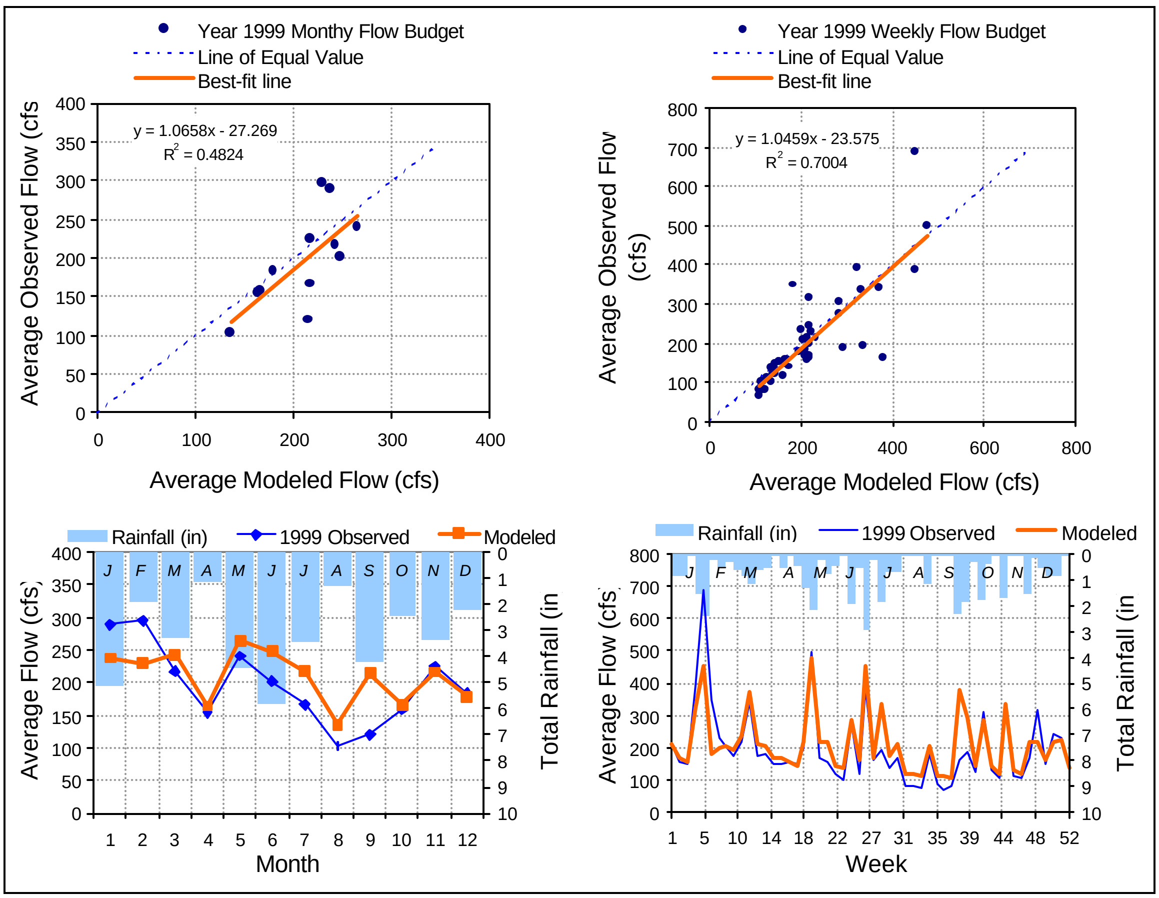


Figure C.7. Calendar Year 1999 (Monthly and Weekly) at 02204070 – South River at Klondike Road.

Simulation Name:	02204070	**Simulation Period:**	
		Watershed Area (ac):	117978
Selected a Year for Flow Analysis:	**1999**		
Type of Year (1=Calendar, 2=Water Year)	**1**	**Baseflow PERCENTILE:**	2.5
Calendar Year 1999:		*Usually 1%-5%*	
1/1/1999 to 12/31/1999			
Total Simulated In-stream Flow:	**15.43**	Total Observed In-stream Flow:	**14.41**
Total of highest 10% flows:	**4.80**	Total of Observed highest 10% flows:	**5.09**
Total of lowest 50% flows:	**4.55**	Total of Observed Lowest 50% flows:	**3.79**
Simulated Summer Flow Volume (months 7-9):	**3.51**	Observed Summer Flow Volume (7-9):	**2.41**
Simulated Fall Flow Volume (months 10-12):	**3.47**	Observed Fall Flow Volume (10-12):	**3.50**
Simulated Winter Flow Volume (months 1-3):	**4.30**	Observed Winter Flow Volume (1-3):	**4.83**
Simulated Spring Flow Volume (months 4-6):	**4.15**	Observed Spring Flow Volume (4-6):	**3.67**
Total Simulated Storm Volume:	**7.54**	Total Observed Storm Volume:	**9.61**
Simulated Summer Storm Volume (7-9):	**1.52**	Observed Summer Storm Volume (7-9):	**1.21**
Errors (Simulated-Observed)		*Recommended Criteria*	Last run
Error in total volume:	**6.63**	10	
Error in 50% lowest flows:	**16.82**	10	
Error in 10% highest flows:	**-6.11**	15	
Seasonal volume error - Summer:	**31.30**	30	
Seasonal volume error - Fall:	**-0.75**	30	
Seasonal volume error - Winter:	**-12.36**	30	
Seasonal volume error - Spring:	**11.63**	30	
Error in storm volumes:	**-27.51**	20	
Error in summer storm volumes:	**20.76**	50	

Figure C.8. Calendar Year 1999 Statistics at 02204070 – South River at Klondike Road.

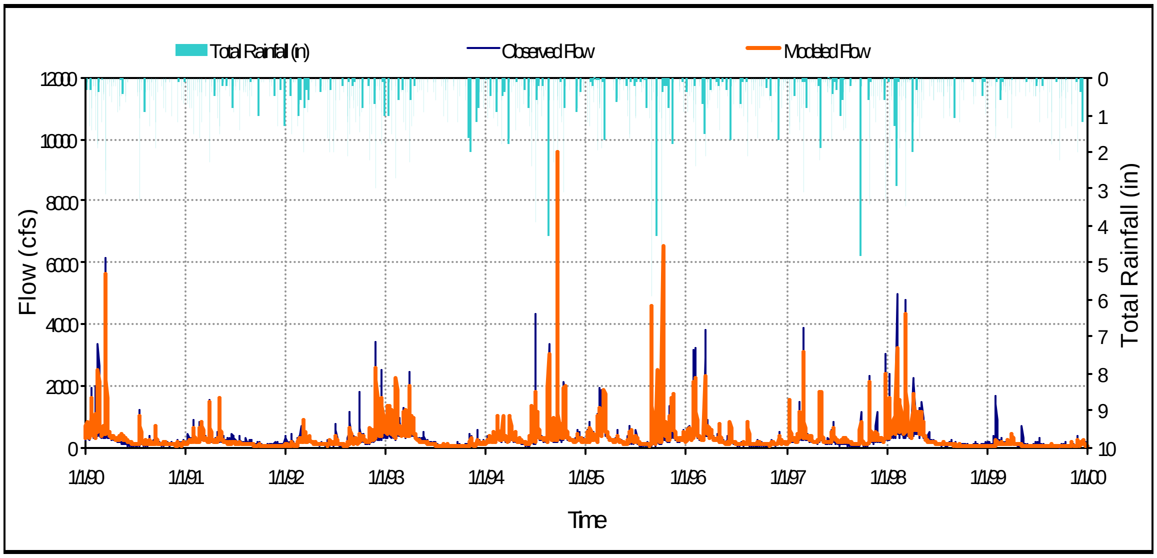


Figure C.9. 10-Year Validation (Daily Flow) at 02219000 – Apalachee River near Bostwick, GA.

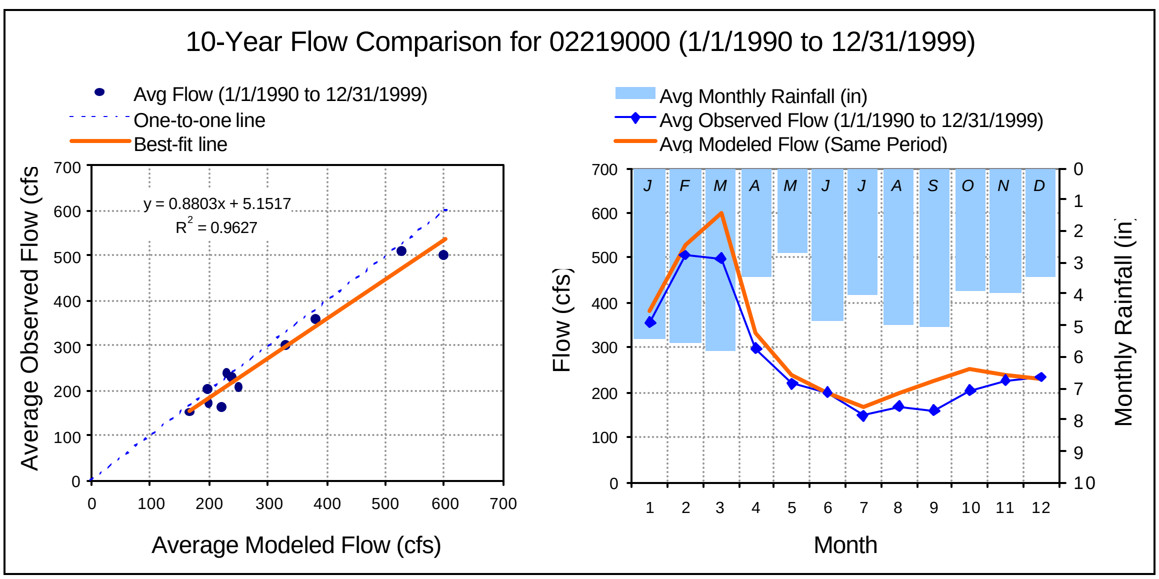


Figure C.10. 10-Year Validation (Monthly Average) at 02219000 – Apalachee River near Bostwick, GA.

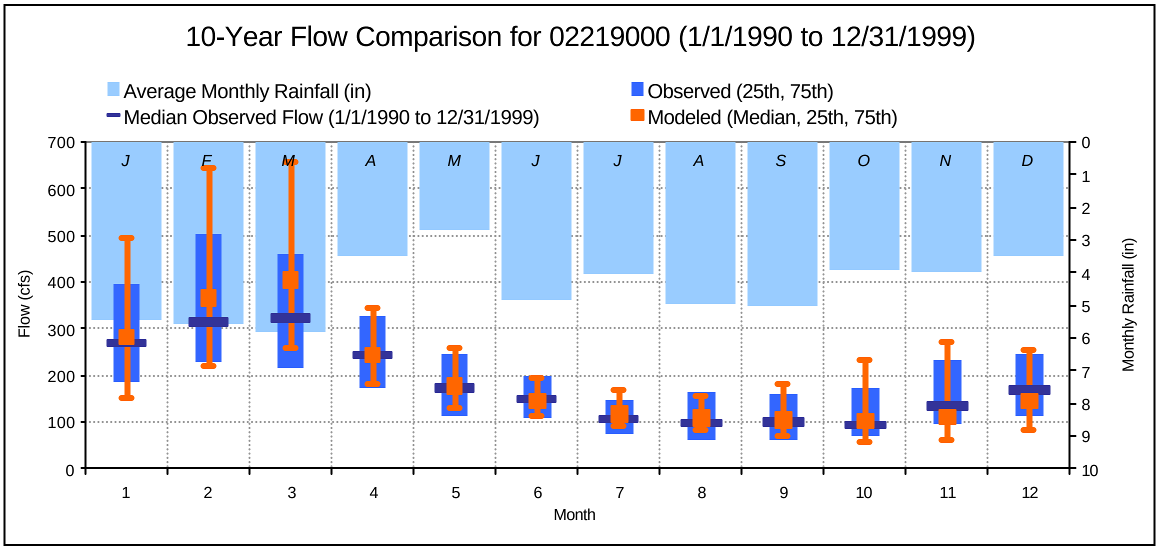


Figure C.11. 10-Year Validation (Monthly Medians) at 02219000 – Apalachee River near Bostwick, GA.

Simulation Name:	02219000	**Simulation Period:**	
		Watershed Area (ac):	119738
Period for Flow Analysis			
Begin Date:	**01/01/90**	**Baseflow PERCENTILE:**	2.5
End Date:	**12/31/99**	*Usually 1%-5%*	
Total Simulated In-stream Flow:	**217.08**	Total Observed In-stream Flow:	**194.66**
Total of highest 10% flows:	**90.29**	Total of Observed highest 10% flows:	**78.55**
Total of lowest 50% flows:	**35.38**	Total of Observed Lowest 50% flows:	**37.57**
Simulated Summer Flow Volume (months 7-9):	**36.16**	Observed Summer Flow Volume (7-9):	**29.31**
Simulated Fall Flow Volume (months 10-12):	**44.03**	Observed Fall Flow Volume (10-12):	**40.69**
Simulated Winter Flow Volume (months 1-3):	**90.27**	Observed Winter Flow Volume (1-3):	**81.15**
Simulated Spring Flow Volume (months 4-6):	**46.62**	Observed Spring Flow Volume (4-6):	**43.51**
Total Simulated Storm Volume:	**185.93**	Total Observed Storm Volume:	**162.94**
Simulated Summer Storm Volume (7-9):	**28.43**	Observed Summer Storm Volume (7-9):	**21.48**
Errors (Simulated-Observed)		*Recommended Criteria*	Last run
Error in total volume:	**10.33**	10	
Error in 50% lowest flows:	**-6.21**	10	
Error in 10% highest flows:	**13.01**	15	
Seasonal volume error - Summer:	**18.93**	30	
Seasonal volume error - Fall:	**7.60**	30	
Seasonal volume error - Winter:	**10.10**	30	
Seasonal volume error - Spring:	**6.66**	30	
Error in storm volumes:	**12.36**	20	
Error in summer storm volumes:	**24.43**	50	

Figure C.12. 10-Year Validation Statistics at 02219000 – Apalachee River near Bostwick, GA.

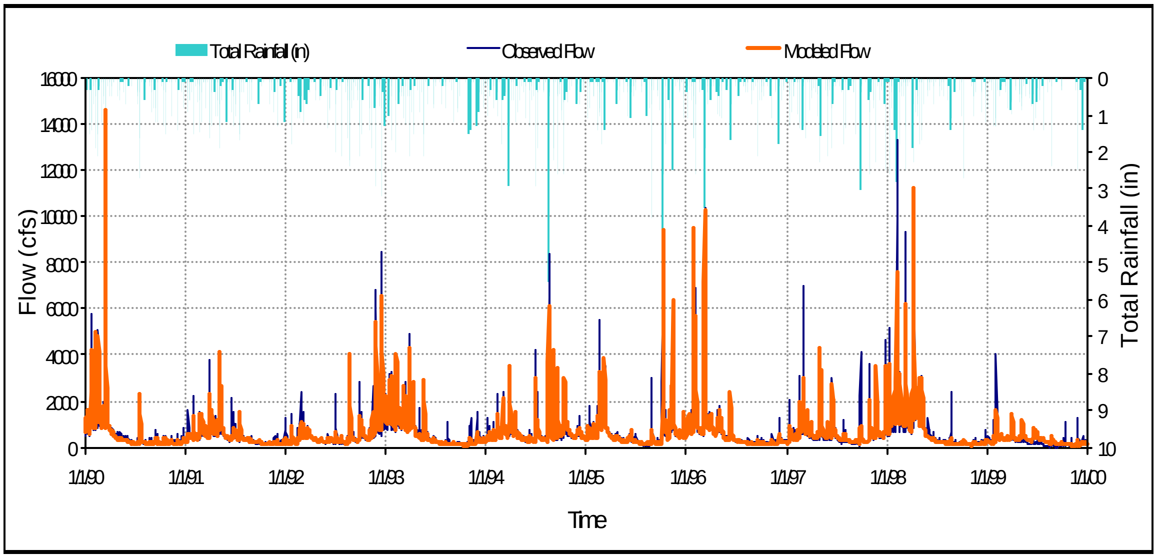


Figure C.13. 10-Year Validation (Daily Flow) at 02217500 – Middle Oconee River near Athens, GA.

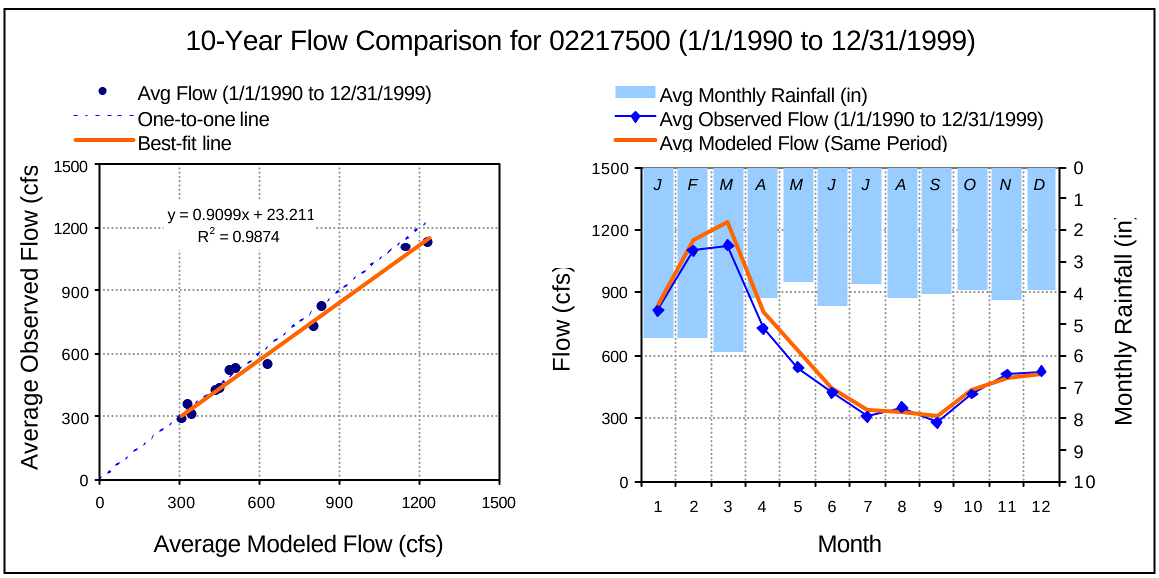


Figure C.14. 10-Year Validation (Monthly Average) at 02217500 – Middle Oconee River near Athens, GA.

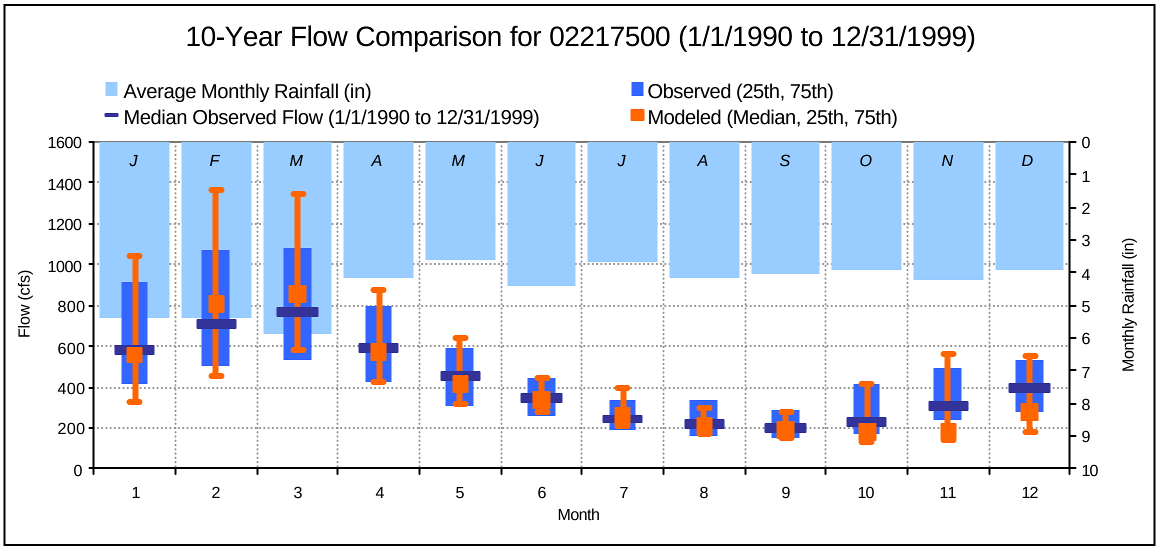


Figure C.15. 10-Year Validation (Monthly Medians) at 02217500 – Middle Oconee River near Athens, GA.

Simulation Name:	02217500	**Simulation Period:**	
		Watershed Area (ac):	252006
Period for Flow Analysis			
Begin Date:	**01/01/90**	**Baseflow PERCENTILE:**	2.5
End Date:	**12/31/99**	*Usually 1%-5%*	
Total Simulated In-stream Flow:	**216.24**	Total Observed In-stream Flow:	**204.71**
Total of highest 10% flows:	**86.28**	Total of Observed highest 10% flows:	**78.78**
Total of lowest 50% flows:	**38.25**	Total of Observed Lowest 50% flows:	**41.80**
Simulated Summer Flow Volume (months 7-9):	**28.67**	Observed Summer Flow Volume (7-9):	**27.55**
Simulated Fall Flow Volume (months 10-12):	**41.92**	Observed Fall Flow Volume (10-12):	**42.23**
Simulated Winter Flow Volume (months 1-3):	**91.48**	Observed Winter Flow Volume (1-3):	**86.27**
Simulated Spring Flow Volume (months 4-6):	**54.17**	Observed Spring Flow Volume (4-6):	**48.65**
Total Simulated Storm Volume:	**175.96**	Total Observed Storm Volume:	**167.18**
Simulated Summer Storm Volume (7-9):	**18.50**	Observed Summer Storm Volume (7-9):	**18.39**
Errors (Simulated-Observed)		*Recommended Criteria*	Last run
Error in total volume:	**5.33**	10	
Error in 50% lowest flows:	**-9.30**	10	
Error in 10% highest flows:	**8.69**	15	
Seasonal volume error - Summer:	**3.89**	30	
Seasonal volume error - Fall:	**-0.74**	30	
Seasonal volume error - Winter:	**5.69**	30	
Seasonal volume error - Spring:	**10.19**	30	
Error in storm volumes:	**4.99**	20	
Error in summer storm volumes:	**0.61**	50	

Figure C.16. 10-Year Validation Statistics at 02217500 – Middle Oconee River near Athens, GA.

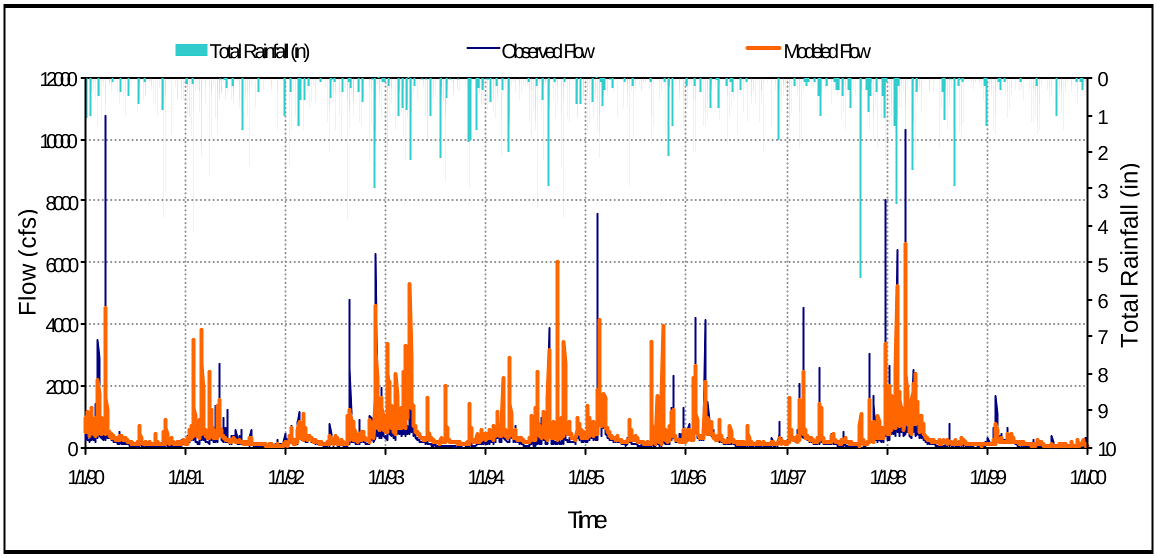


Figure C.17. 10-Year Validation (Daily Flow) at 02220900 – Little River near Eatonton, GA.

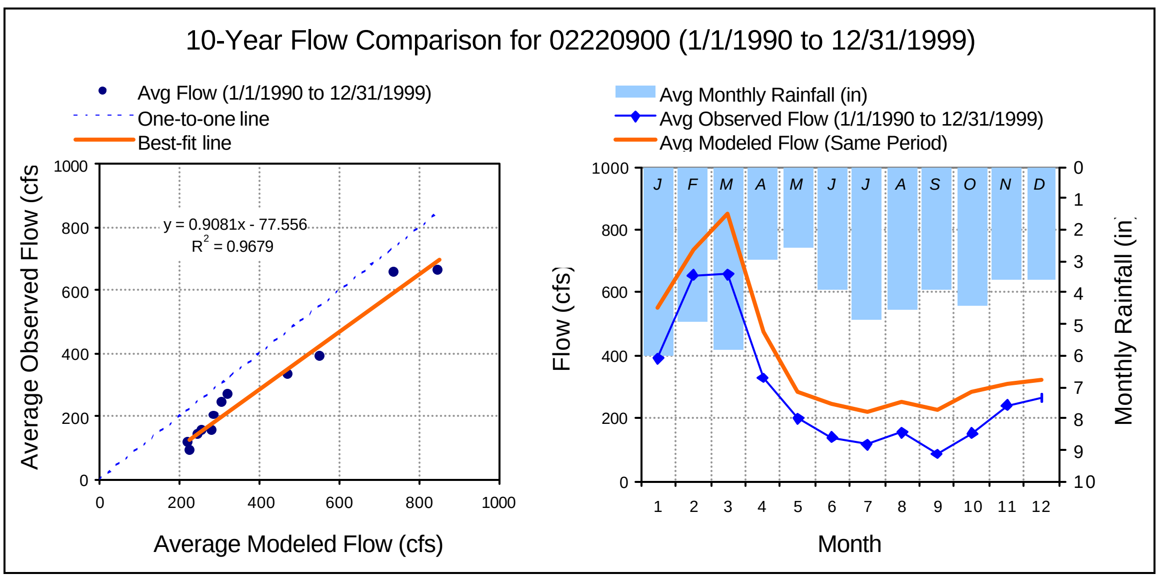


Figure C.18. 10-Year Validation (Monthly Average) at 02220900 – Little River near Eatonton, GA.

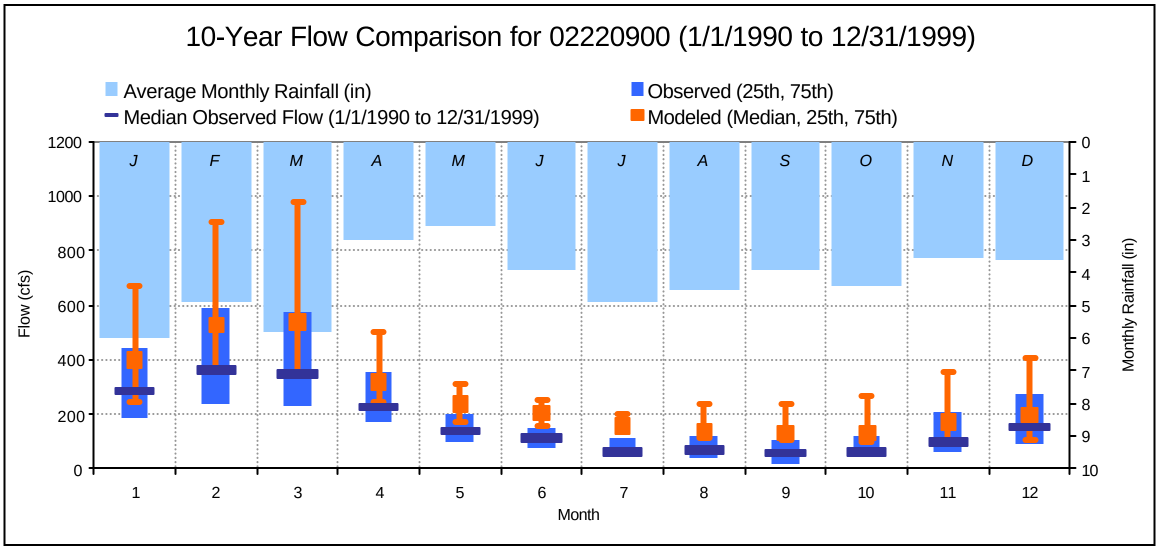


Figure C.19. 10-Year Validation (Monthly Medians) at 02220900 – Little River near Eatonton, GA.

Simulation Name:	02220900	**Simulation Period:**	
		Watershed Area (ac):	174445
Period for Flow Analysis			
Begin Date:	**01/01/90**	**Baseflow PERCENTILE:**	2.5
End Date:	**12/31/99**	*Usually 1%-5%*	
Total Simulated In-stream Flow:	**197.17**	Total Observed In-stream Flow:	**140.21**
Total of highest 10% flows:	**77.93**	Total of Observed highest 10% flows:	**67.14**
Total of lowest 50% flows:	**34.87**	Total of Observed Lowest 50% flows:	**18.88**
Simulated Summer Flow Volume (months 7-9):	**29.53**	Observed Summer Flow Volume (7-9):	**15.17**
Simulated Fall Flow Volume (months 10-12):	**38.32**	Observed Fall Flow Volume (10-12):	**27.72**
Simulated Winter Flow Volume (months 1-3):	**87.78**	Observed Winter Flow Volume (1-3):	**69.58**
Simulated Spring Flow Volume (months 4-6):	**41.54**	Observed Spring Flow Volume (4-6):	**27.75**
Total Simulated Storm Volume:	**162.94**	Total Observed Storm Volume:	**131.80**
Simulated Summer Storm Volume (7-9):	**20.93**	Observed Summer Storm Volume (7-9):	**13.08**
Errors (Simulated-Observed)		*Recommended Criteria*	Last run
Error in total volume:	**28.89**	10	
Error in 50% lowest flows:	**45.86**	10	
Error in 10% highest flows:	**13.84**	15	
Seasonal volume error - Summer:	**48.64**	30	
Seasonal volume error - Fall:	**27.66**	30	
Seasonal volume error - Winter:	**20.74**	30	
Seasonal volume error - Spring:	**33.20**	30	
Error in storm volumes:	**19.11**	20	
Error in summer storm volumes:	**37.52**	50	

Figure C.20. 10-Year Validation Statistics at 02220900 – Little River near Eatonton, GA.

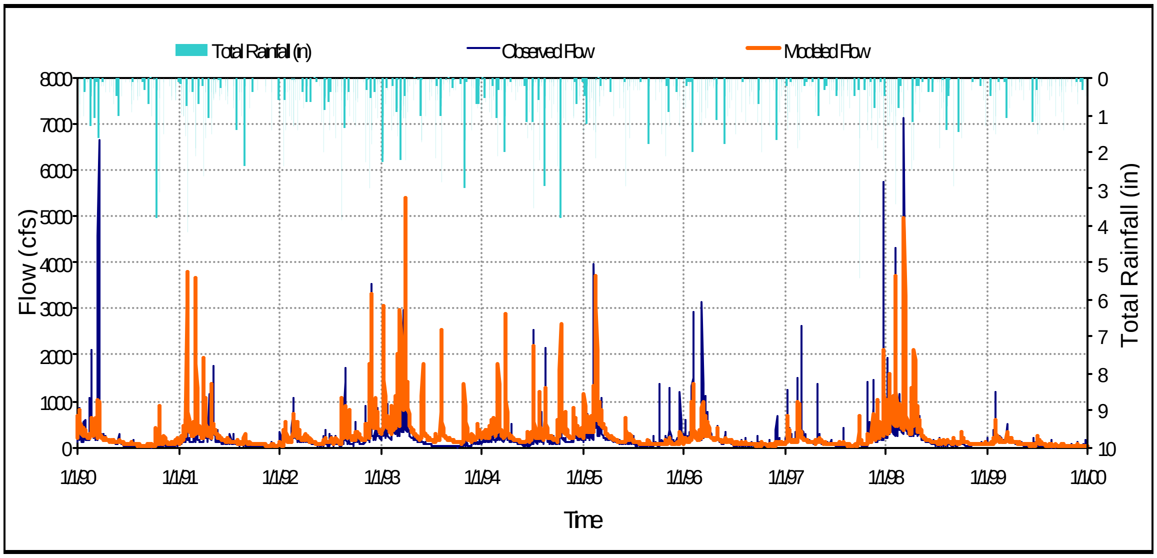


Figure C.21. 10-Year Validation (Daily Flow) at 02221525 – Murder Creek below Eatonton, GA.

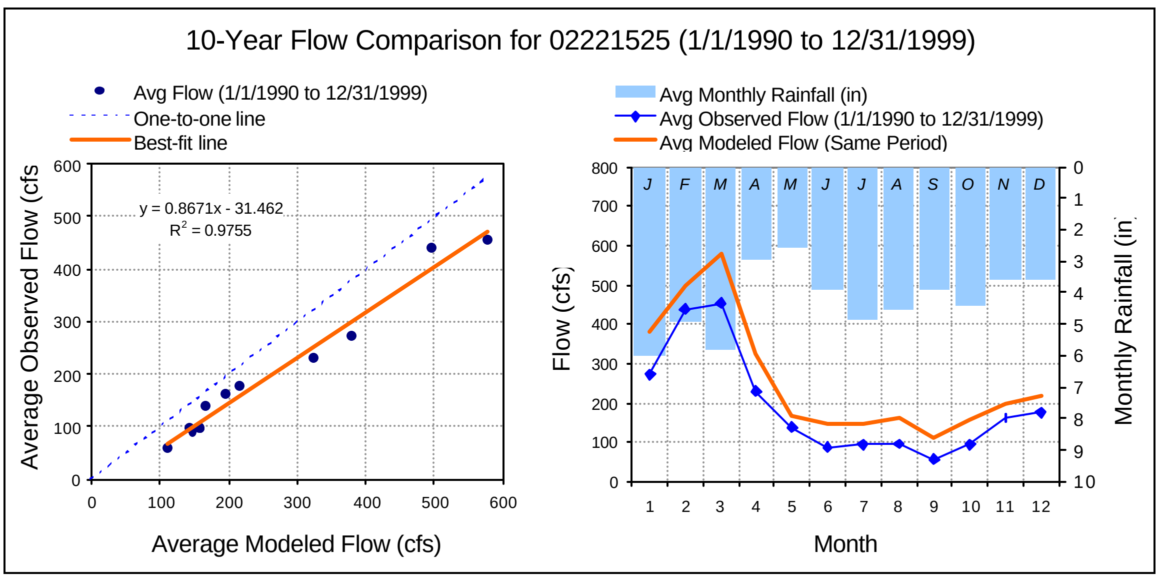


Figure C.22. 10-Year Validation (Monthly Average) at 02221525 – Murder Creek below Eatonton, GA.

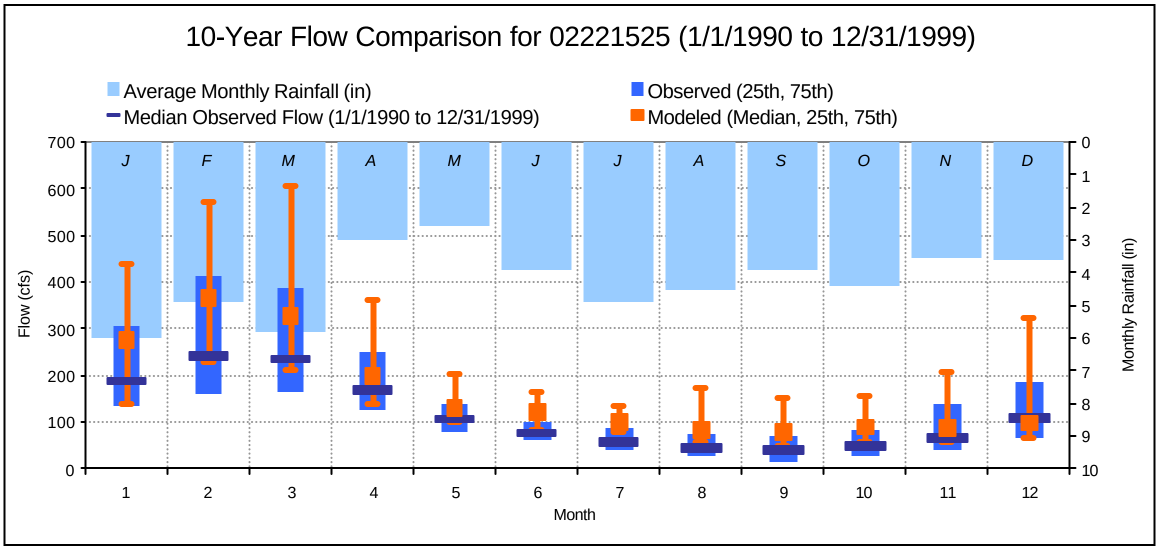


Figure C.23. 10-Year Validation (Monthly Medians) at 02221525 – Murder Creek below Eatonton, GA.

Simulation Name:	02221525	**Simulation Period:**	
		Watershed Area (ac):	121690
Period for Flow Analysis			
Begin Date:	**01/01/90**	**Baseflow PERCENTILE:**	2.5
End Date:	**12/31/99**	*Usually 1%-5%*	
Total Simulated In-stream Flow:	**183.13**	Total Observed In-stream Flow:	**136.13**
Total of highest 10% flows:	**77.13**	Total of Observed highest 10% flows:	**65.23**
Total of lowest 50% flows:	**29.68**	Total of Observed Lowest 50% flows:	**19.42**
Simulated Summer Flow Volume (months 7-9):	**25.17**	Observed Summer Flow Volume (7-9):	**14.98**
Simulated Fall Flow Volume (months 10-12):	**34.40**	Observed Fall Flow Volume (10-12):	**25.89**
Simulated Winter Flow Volume (months 1-3):	**85.48**	Observed Winter Flow Volume (1-3):	**68.24**
Simulated Spring Flow Volume (months 4-6):	**38.09**	Observed Spring Flow Volume (4-6):	**27.02**
Total Simulated Storm Volume:	**154.89**	Total Observed Storm Volume:	**126.19**
Simulated Summer Storm Volume (7-9):	**18.04**	Observed Summer Storm Volume (7-9):	**12.51**
Errors (Simulated-Observed)		*Recommended Criteria*	Last run
Error in total volume:	**25.67**	10	
Error in 50% lowest flows:	**34.59**	10	
Error in 10% highest flows:	**15.43**	15	
Seasonal volume error - Summer:	**40.47**	30	
Seasonal volume error - Fall:	**24.73**	30	
Seasonal volume error - Winter:	**20.17**	30	
Seasonal volume error - Spring:	**29.06**	30	
Error in storm volumes:	**18.52**	20	
Error in summer storm volumes:	**30.66**	50	

Figure C.24. 10-Year Validation Statistics at 02221525 – Murder Creek below Eatonton, GA.

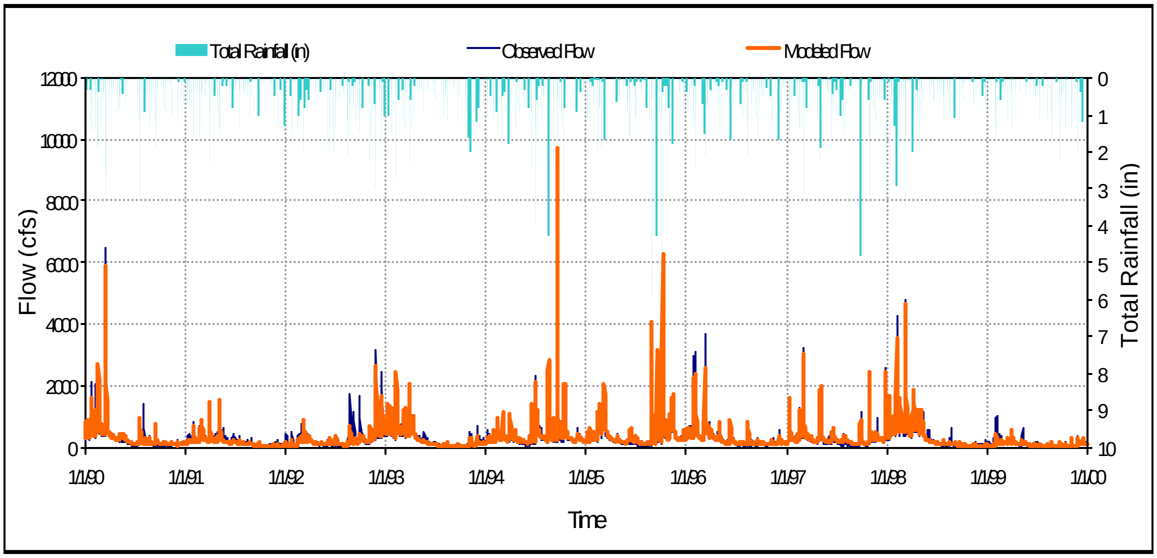


Figure C.25. 10-Year Validation (Daily Flow) at 02208450 – Alcovy River above Covington, GA.

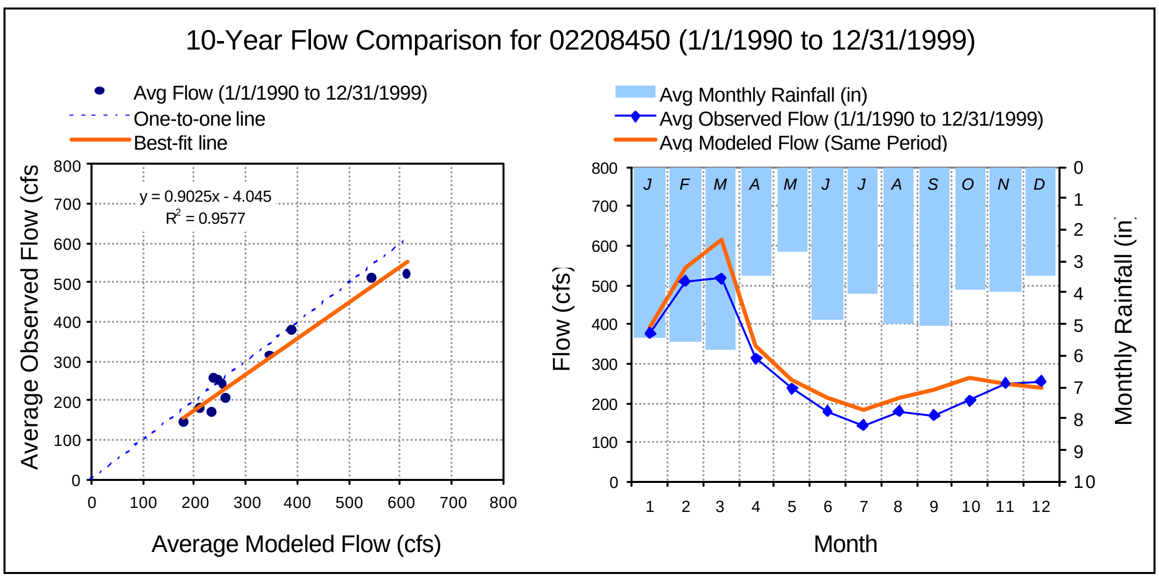


Figure C.26. 10-Year Validation (Monthly Average) at 02208450 – Alcovy River above Covington, GA.

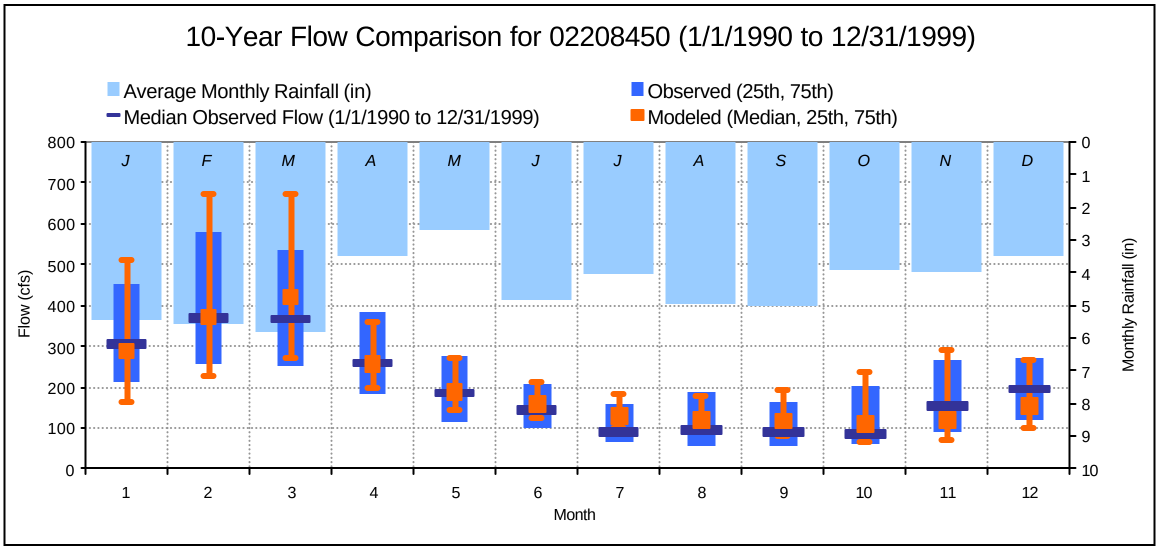


Figure C.27. 10-Year Validation (Monthly Medians) at 02208450 – Alcovy River above Covington, GA.

Simulation Name:	02208450	**Simulation Period:**	
		Watershed Area (ac):	122720
Period for Flow Analysis			
Begin Date:	**01/01/90**	**Baseflow PERCENTILE:**	2.5
End Date:	**12/31/99**	*Usually 1%-5%*	
Total Simulated In-stream Flow:	**220.25**	Total Observed In-stream Flow:	**195.82**
Total of highest 10% flows:	**89.19**	Total of Observed highest 10% flows:	**72.34**
Total of lowest 50% flows:	**38.46**	Total of Observed Lowest 50% flows:	**35.50**
Simulated Summer Flow Volume (months 7-9):	**37.13**	Observed Summer Flow Volume (7-9):	**29.05**
Simulated Fall Flow Volume (months 10-12):	**44.68**	Observed Fall Flow Volume (10-12):	**42.19**
Simulated Winter Flow Volume (months 1-3):	**90.33**	Observed Winter Flow Volume (1-3):	**81.59**
Simulated Spring Flow Volume (months 4-6):	**48.11**	Observed Spring Flow Volume (4-6):	**42.99**
Total Simulated Storm Volume:	**184.55**	Total Observed Storm Volume:	**171.05**
Simulated Summer Storm Volume (7-9):	**28.18**	Observed Summer Storm Volume (7-9):	**22.97**
Errors (Simulated-Observed)		*Recommended Criteria*	Last run
Error in total volume:	**11.09**	10	
Error in 50% lowest flows:	**7.69**	10	
Error in 10% highest flows:	**18.90**	15	
Seasonal volume error - Summer:	**21.75**	30	
Seasonal volume error - Fall:	**5.57**	30	
Seasonal volume error - Winter:	**9.68**	30	
Seasonal volume error - Spring:	**10.64**	30	
Error in storm volumes:	**7.31**	20	
Error in summer storm volumes:	**18.49**	50	

Figure C.28. 10-Year Validation Statistics at 02208450 – Alcovy River above Covington, GA.

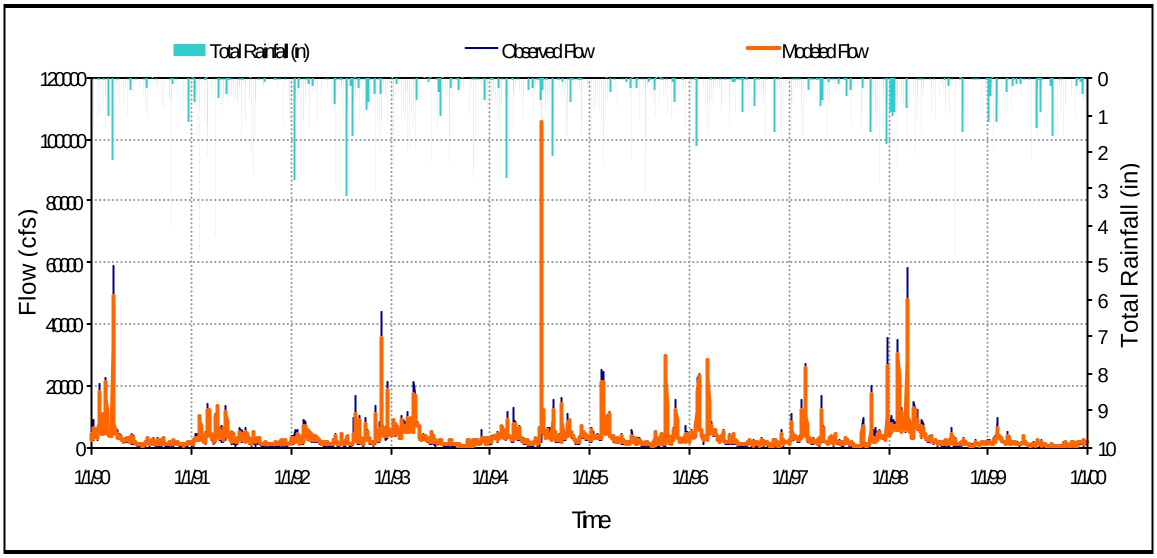


Figure C.29. 10-Year Validation (Daily Flow) at 02213000 – Ocmulgee River at Macon, GA.

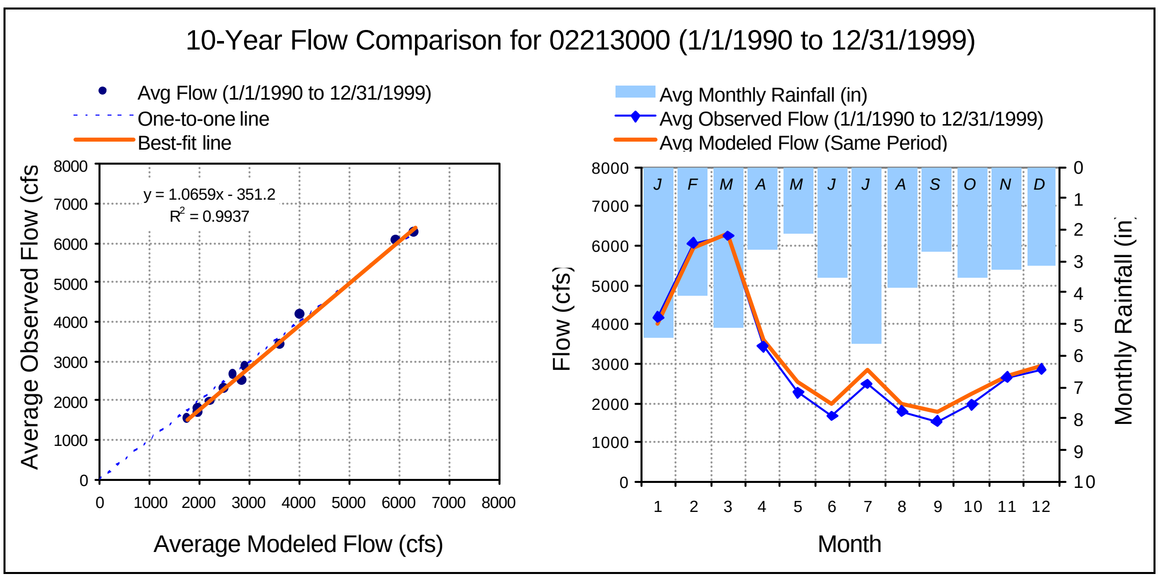


Figure C.30. 10-Year Validation (Monthly Average) at 02213000 – Ocmulgee River at Macon, GA.

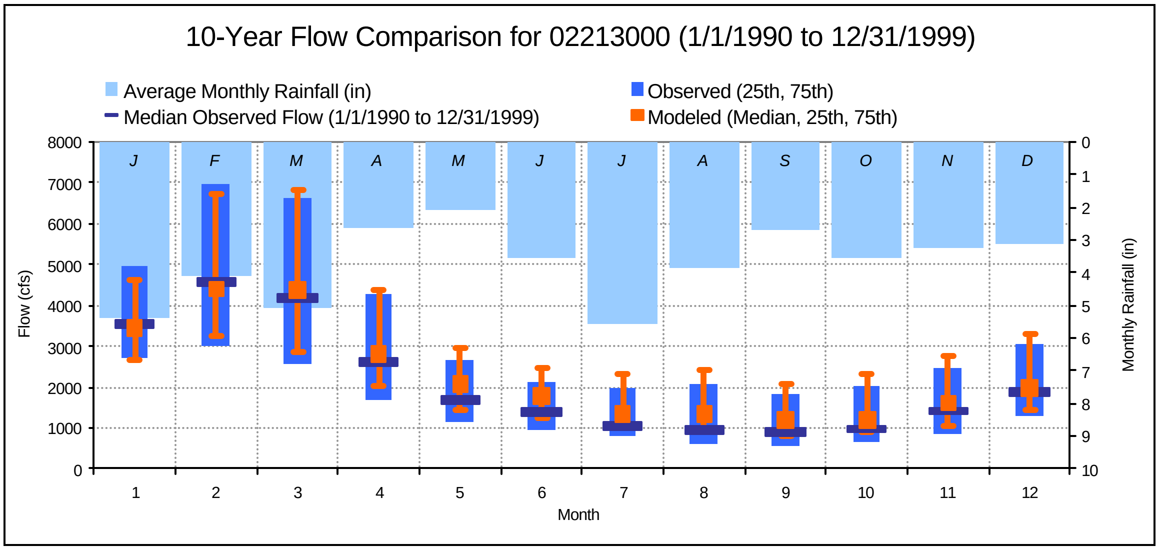


Figure C.31. 10-Year Validation (Monthly Medians) at 02213000 – Ocmulgee River at Macon, GA.

Simulation Name:	02213000	**Simulation Period:**	
		Watershed Area (ac):	1450880
Period for Flow Analysis			
Begin Date:	**01/01/90**	**Baseflow PERCENTILE:**	2.5
End Date:	**12/31/99**	*Usually 1%-5%*	
Total Simulated In-stream Flow:	**193.01**	Total Observed In-stream Flow:	**184.66**
Total of highest 10% flows:	**69.82**	Total of Observed highest 10% flows:	**72.06**
Total of lowest 50% flows:	**38.75**	Total of Observed Lowest 50% flows:	**31.13**
Simulated Summer Flow Volume (months 7-9):	**33.16**	Observed Summer Flow Volume (7-9):	**29.35**
Simulated Fall Flow Volume (months 10-12):	**39.39**	Observed Fall Flow Volume (10-12):	**37.54**
Simulated Winter Flow Volume (months 1-3):	**80.11**	Observed Winter Flow Volume (1-3):	**81.07**
Simulated Spring Flow Volume (months 4-6):	**40.35**	Observed Spring Flow Volume (4-6):	**36.70**
Total Simulated Storm Volume:	**154.66**	Total Observed Storm Volume:	**157.23**
Simulated Summer Storm Volume (7-9):	**23.59**	Observed Summer Storm Volume (7-9):	**22.55**
Errors (Simulated-Observed)		*Recommended Criteria*	Last run
Error in total volume:	**4.33**	10	
Error in 50% lowest flows:	**19.67**	10	
Error in 10% highest flows:	**-3.21**	15	
Seasonal volume error - Summer:	**11.50**	30	
Seasonal volume error - Fall:	**4.71**	30	
Seasonal volume error - Winter:	**-1.20**	30	
Seasonal volume error - Spring:	**9.03**	30	
Error in storm volumes:	**-1.66**	20	
Error in summer storm volumes:	**4.41**	50	

Figure C.32. 10-Year Validation Statistics at 02213000 – Ocmulgee River at Macon, GA.

APPENDIX D:

SIMULATION PERIOD HYDROGRAPHS

FIGURE D-1
COBBS CREEK - HEADWATERS TO SHOAL RIVER
SIMULATION PERIOD STREAMFLOW HYDROGRAPH

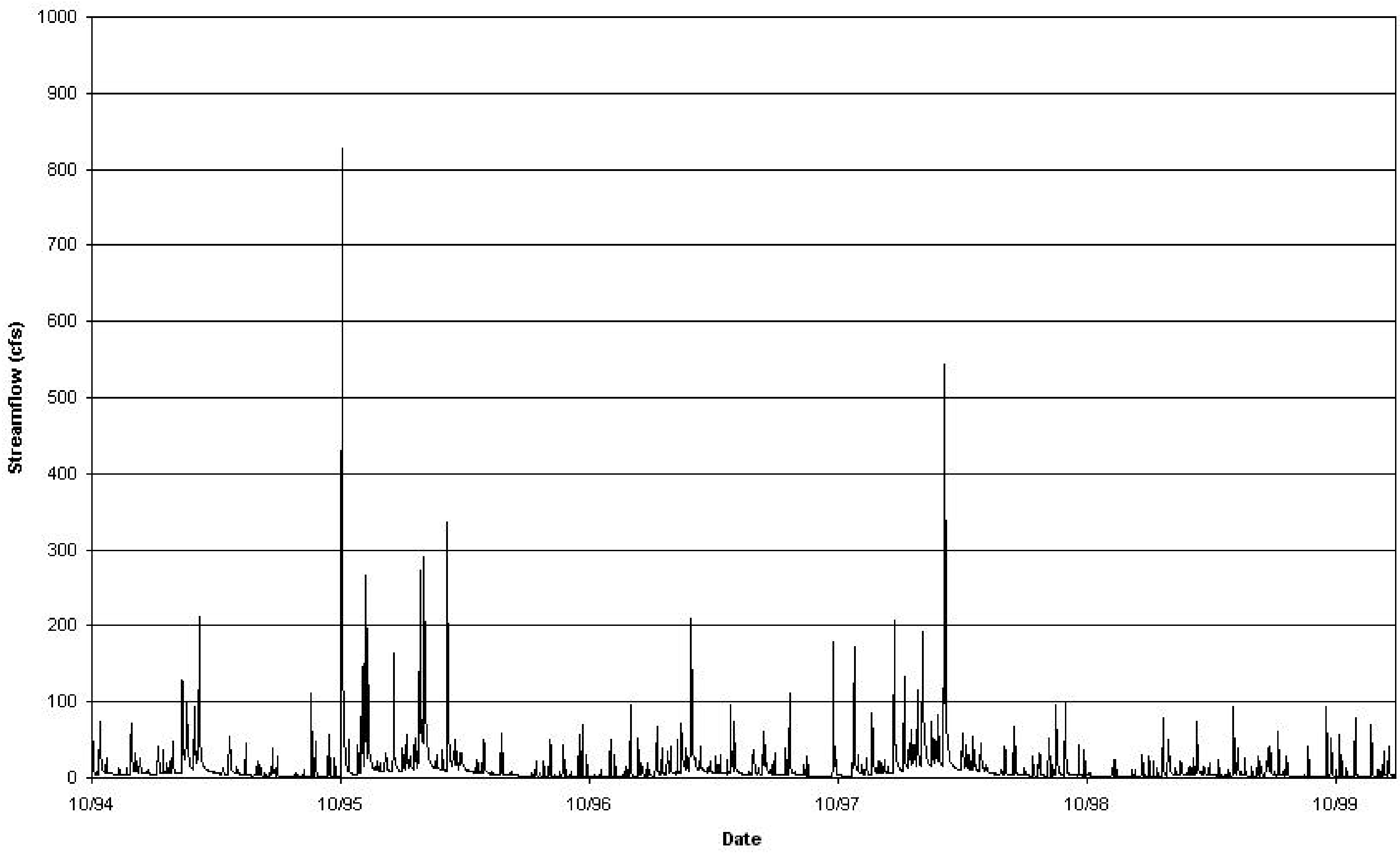


FIGURE D-2
CONLEY CREEK - HEADWATERS TO SOUTH RIVER
SIMULATION PERIOD STREAMFLOW HYDROGRAPH

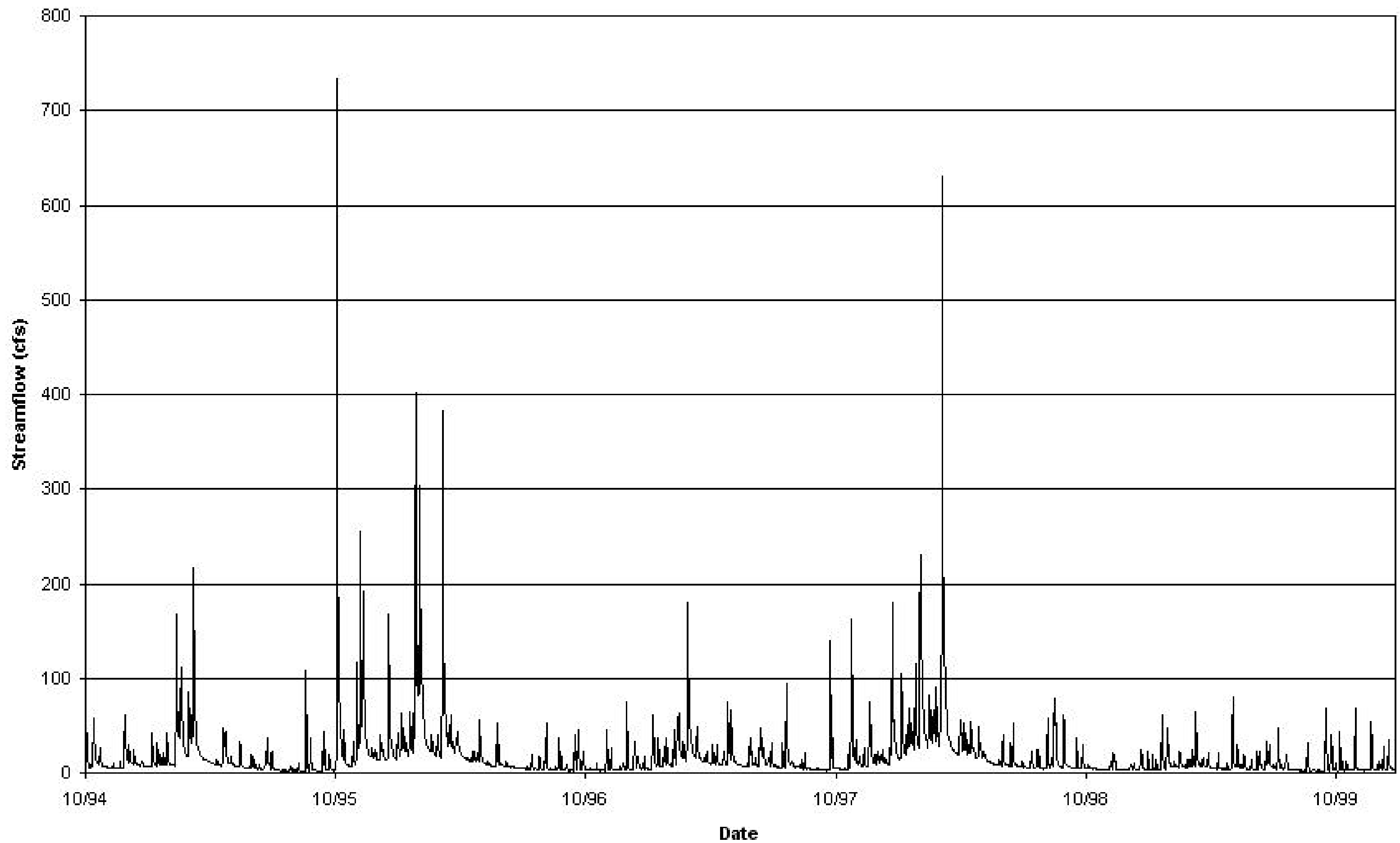


FIGURE D-3
DOLESS CREEK - HEADWATERS TO DOOLITTLE CREEK
SIMULATION PERIOD STREAMFLOW HYDROGRAPH

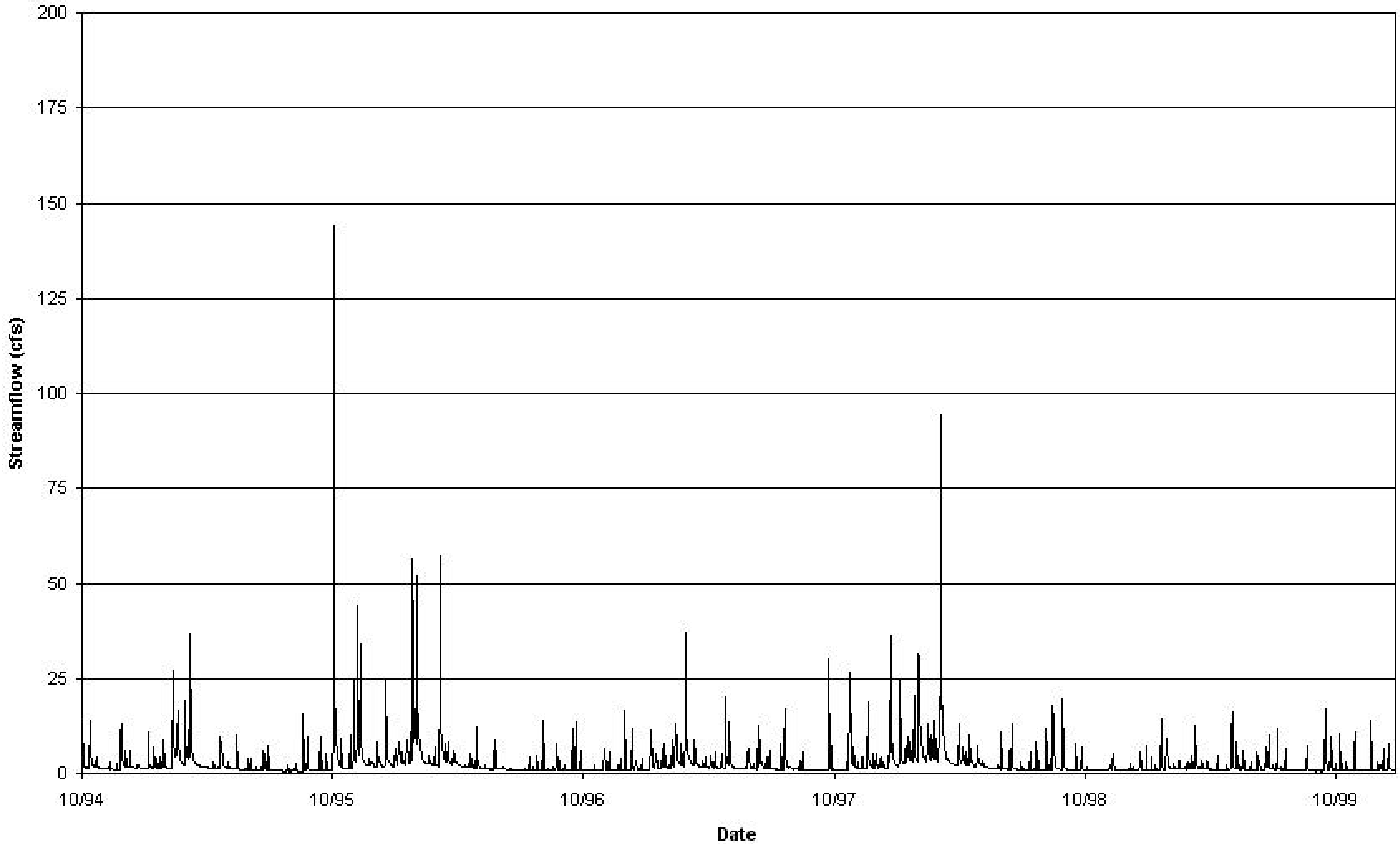


FIGURE D-4
DOOLITTLE CREEK - HEADWATERS TO SOUTH RIVER
SIMULATION PERIOD STREAMFLOW HYDROGRAPH

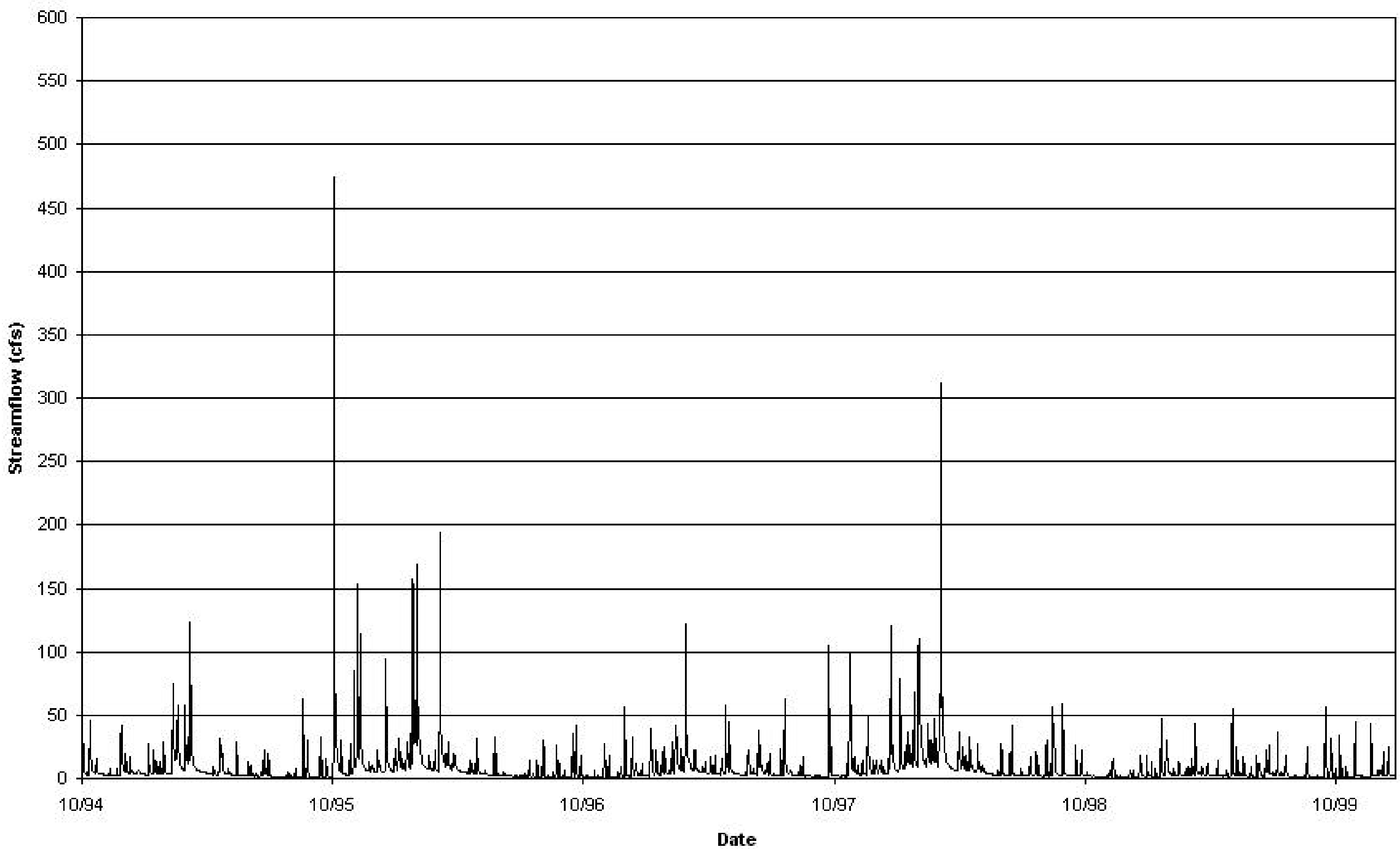


FIGURE D-5
HONEY CREEK - HEADWATERS TO SOUTH RIVER
SIMULATION PERIOD STREAMFLOW HYDROGRAPH

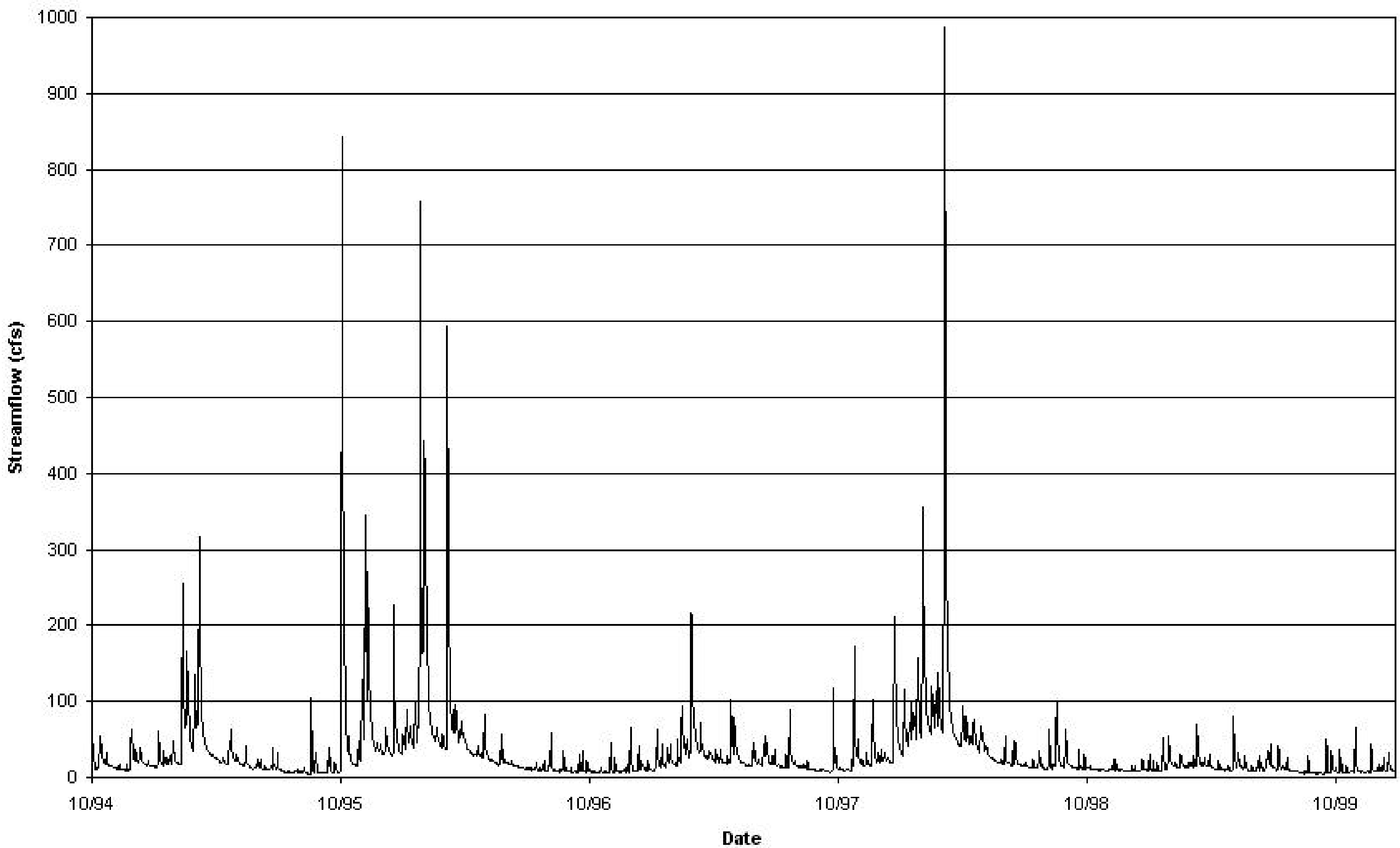


FIGURE D-6
INTRENCHMENT CREEK - HEADWATERS TO SOUTH RIVER
SIMULATION PERIOD STREAMFLOW HYDROGRAPH

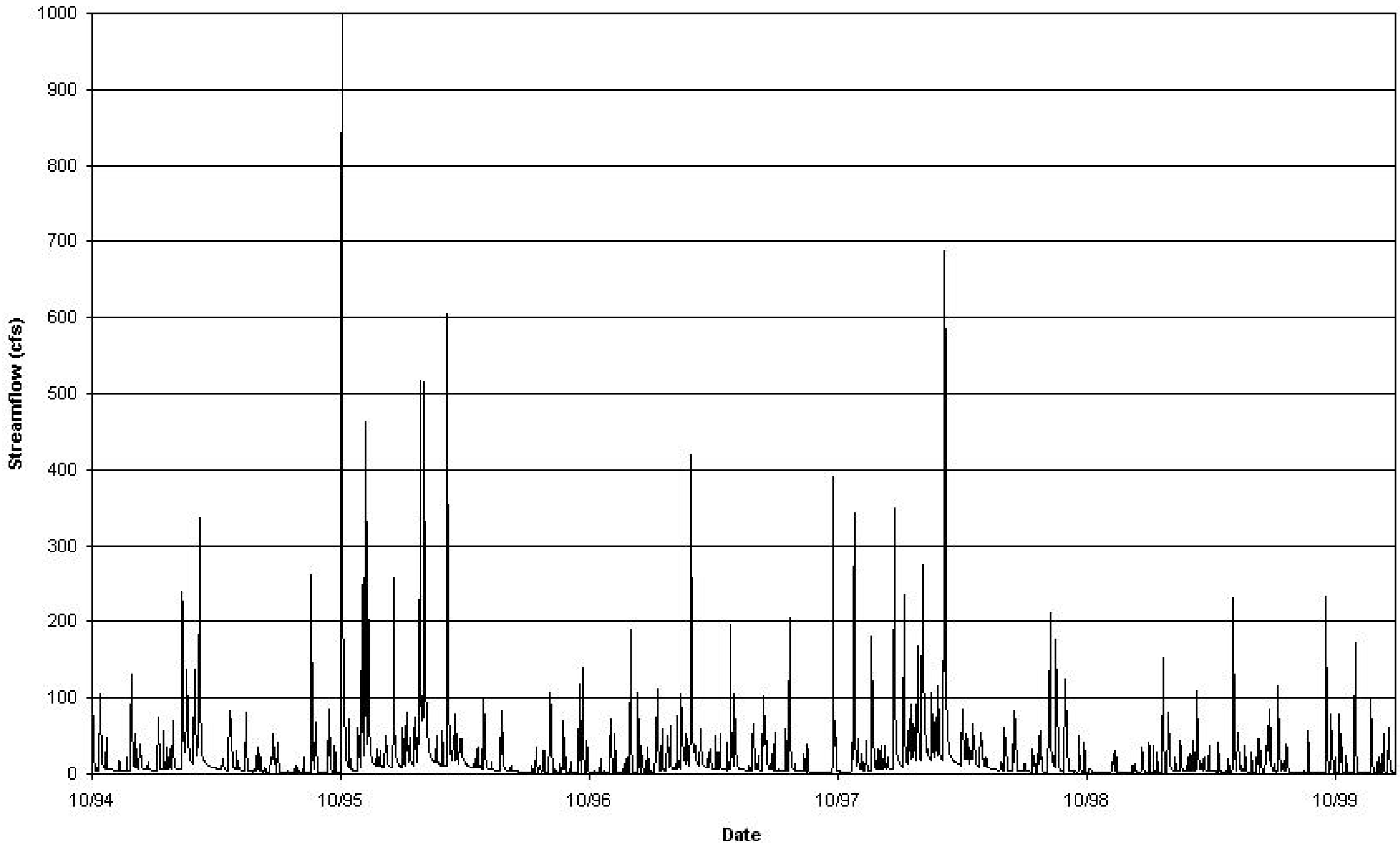


FIGURE D-7
McCLAIN BRANCH - HEADWATERS TO HONEY CREEK
SIMULATION PERIOD STREAMFLOW HYDROGRAPH

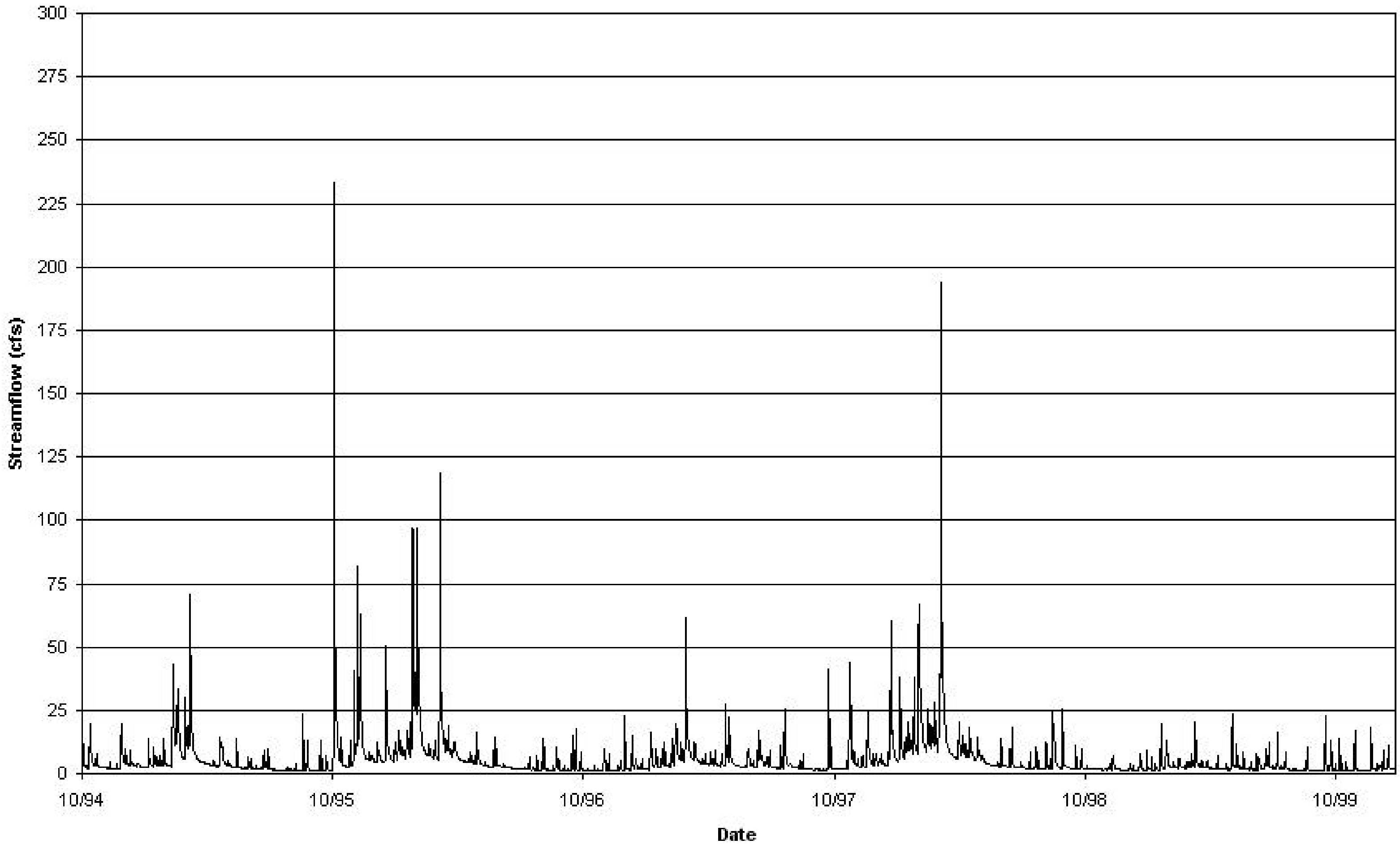


FIGURE D-8
NORTH BRANCH SOUTH RIVER - ATLANTA
SIMULATION PERIOD STREAMFLOW HYDROGRAPH

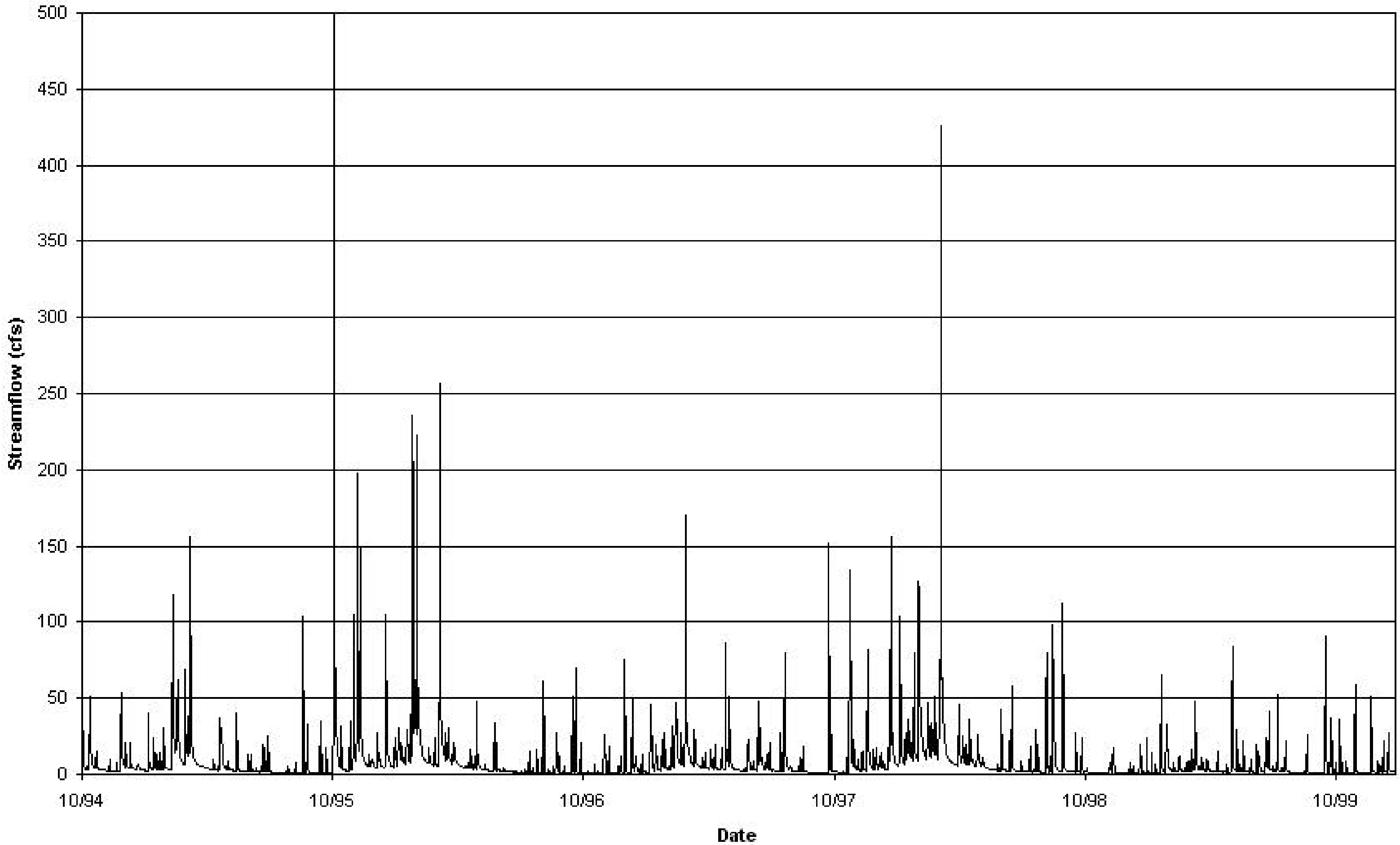


FIGURE D-9
SHOAL CREEK - HEADWATERS TO SOUTH RIVER
SIMULATION PERIOD STREAMFLOW HYDROGRAPH

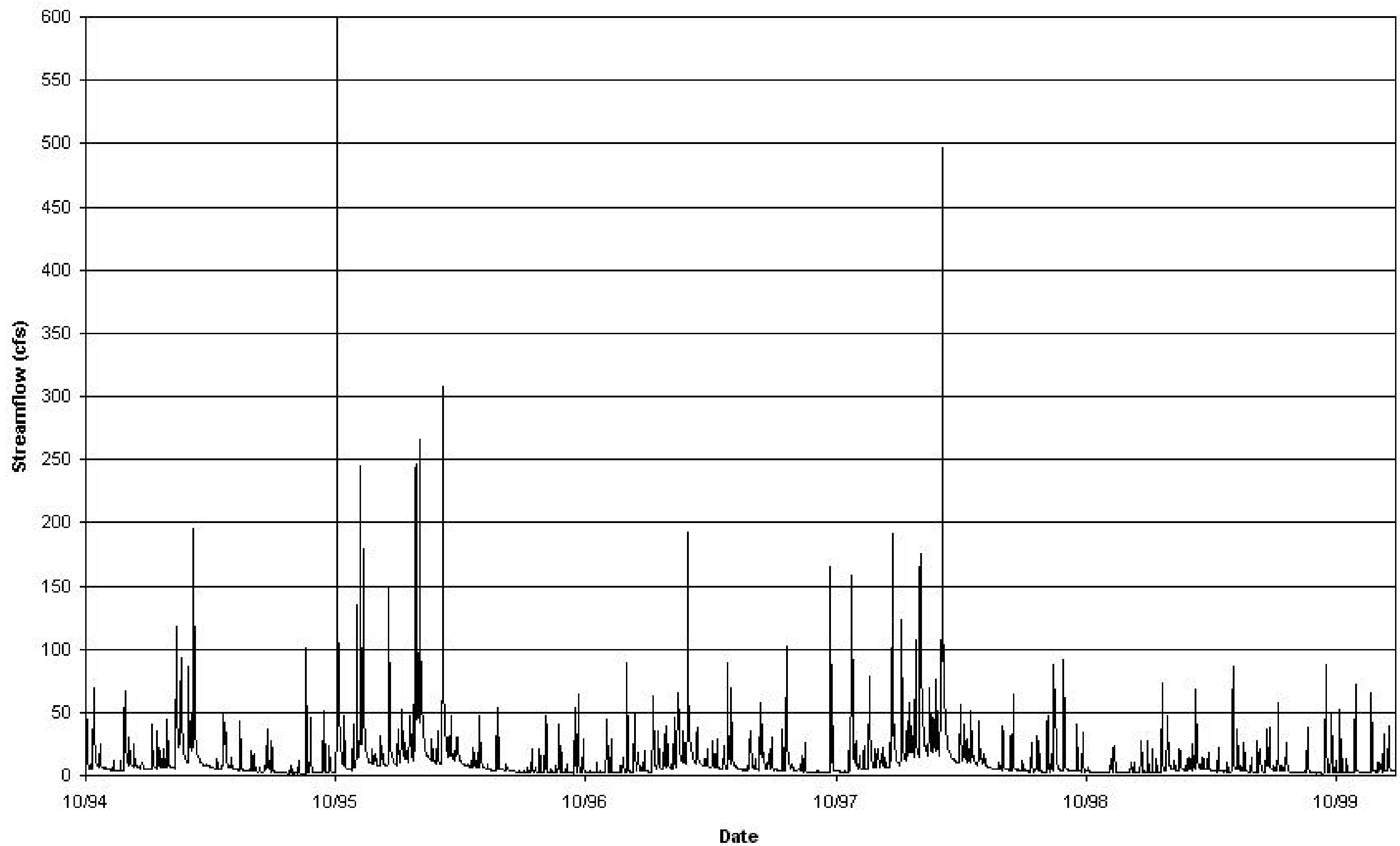


FIGURE D-10
SNAPFINGER CREEK - DEKALB COUNTY
SIMULATION PERIOD STREAMFLOW HYDROGRAPH

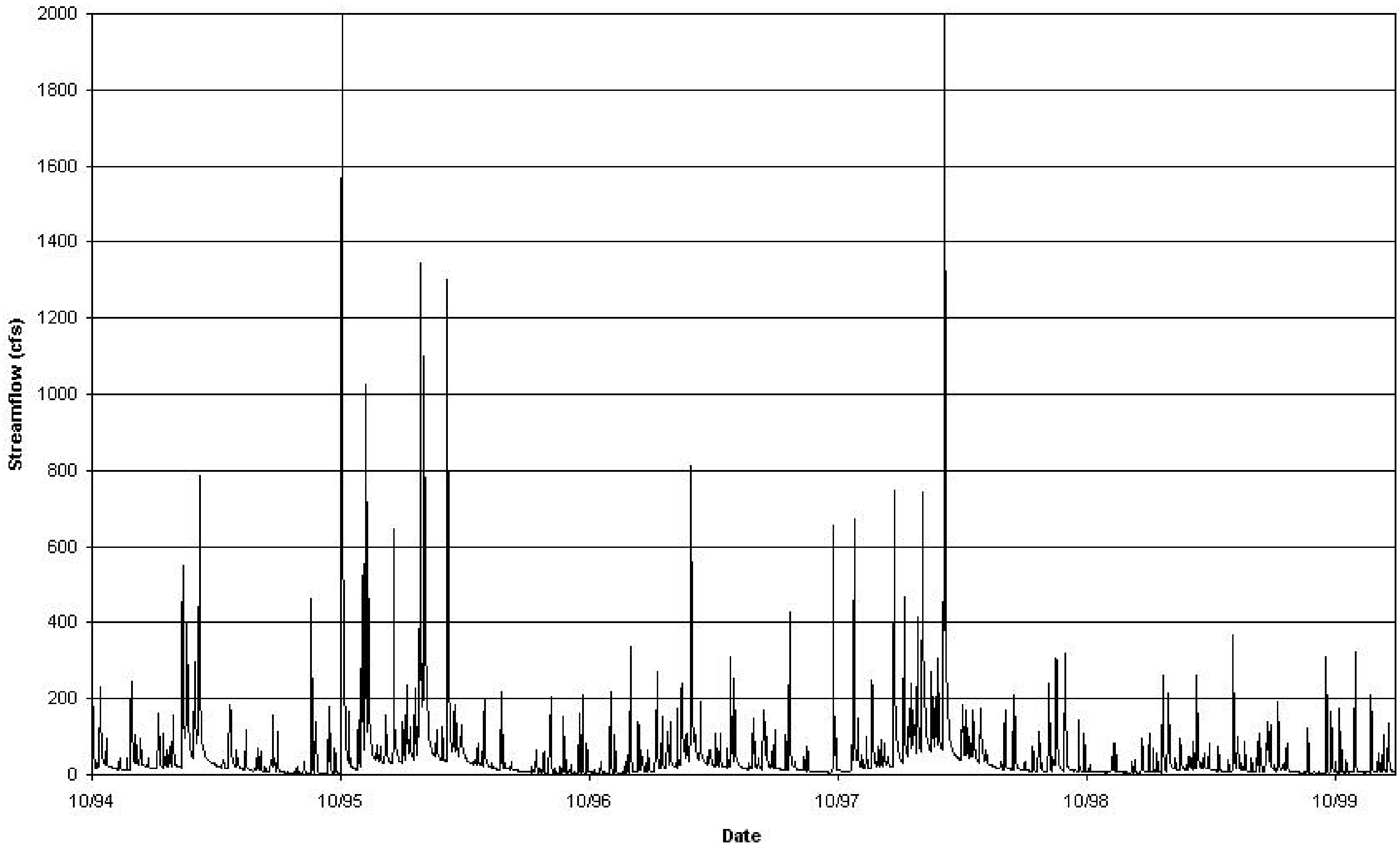
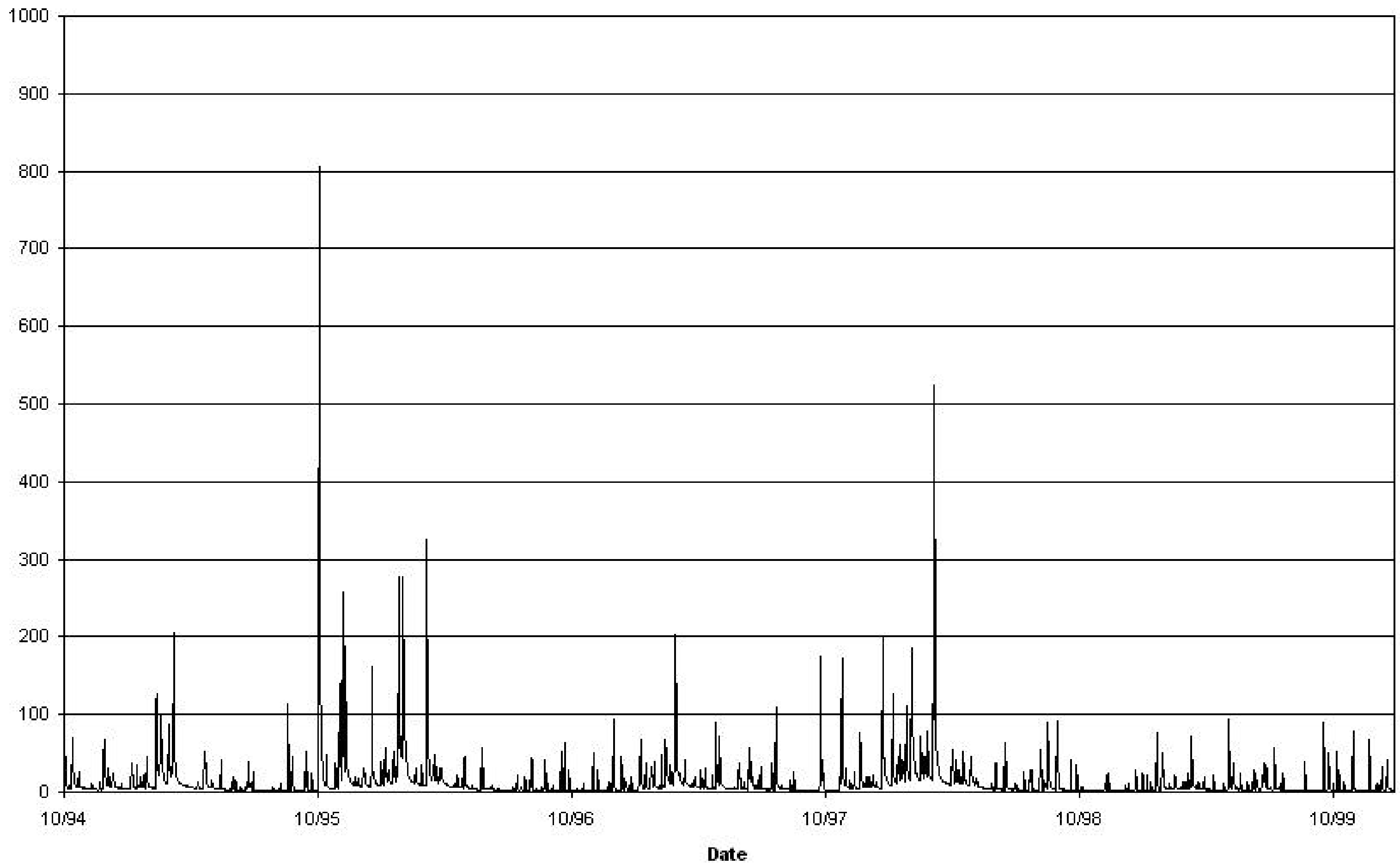


FIGURE D-11
SUGAR CREEK - U/S MEMORIAL DRIVE TO SOUTH RIVER
SIMULATION PERIOD STREAMFLOW HYDROGRAPH



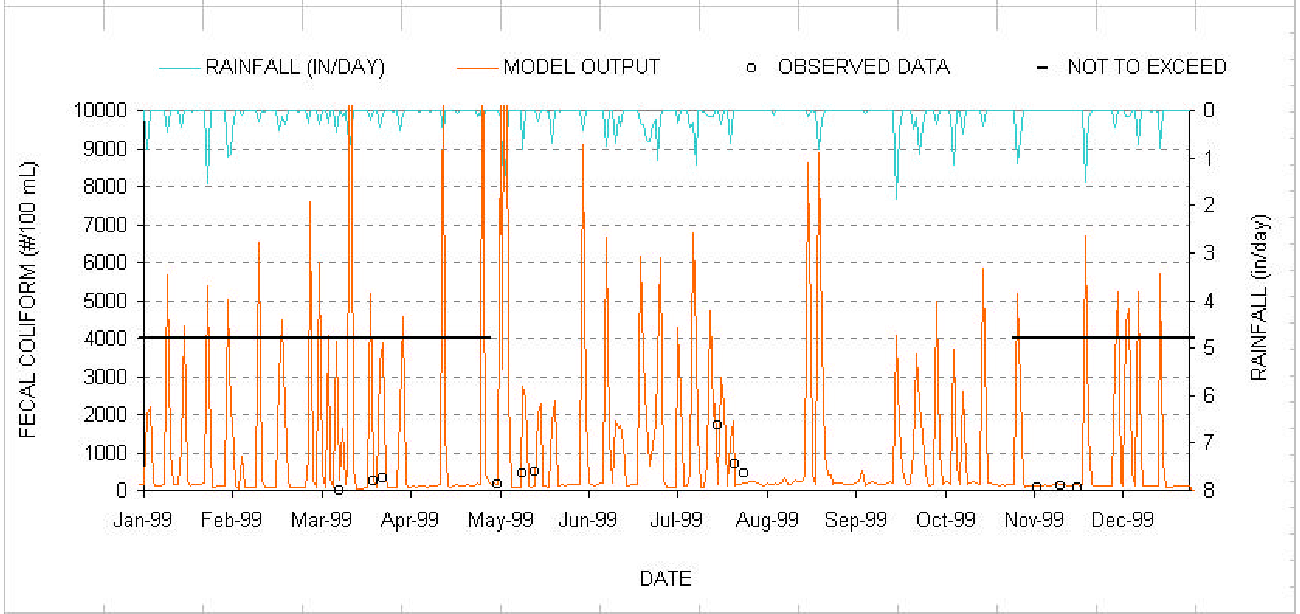
APPENDIX E:

WATER QUALITY CALIBRATIONS

FIGURE E-1

WATER QUALITY CALIBRATION

COBBS CREEK - HEADWATERS TO SHOAL CREEK



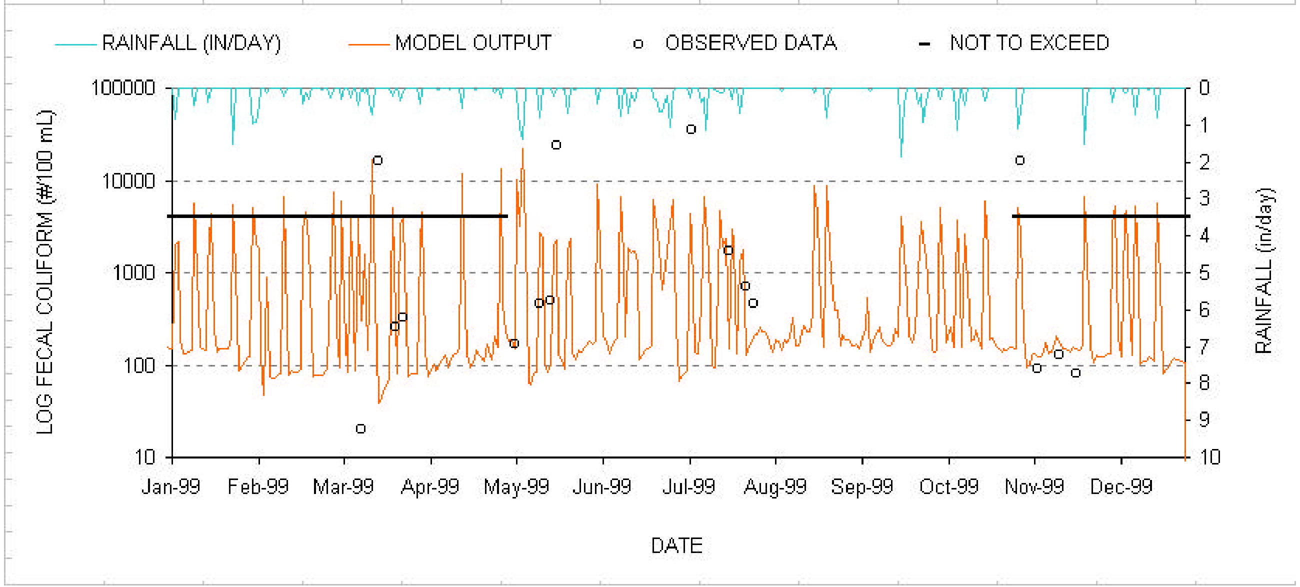


FIGURE E-2

WATER QUALITY CALIBRATION

CONLEY CREEK - HEADWATERS TO SOUTH RIVER

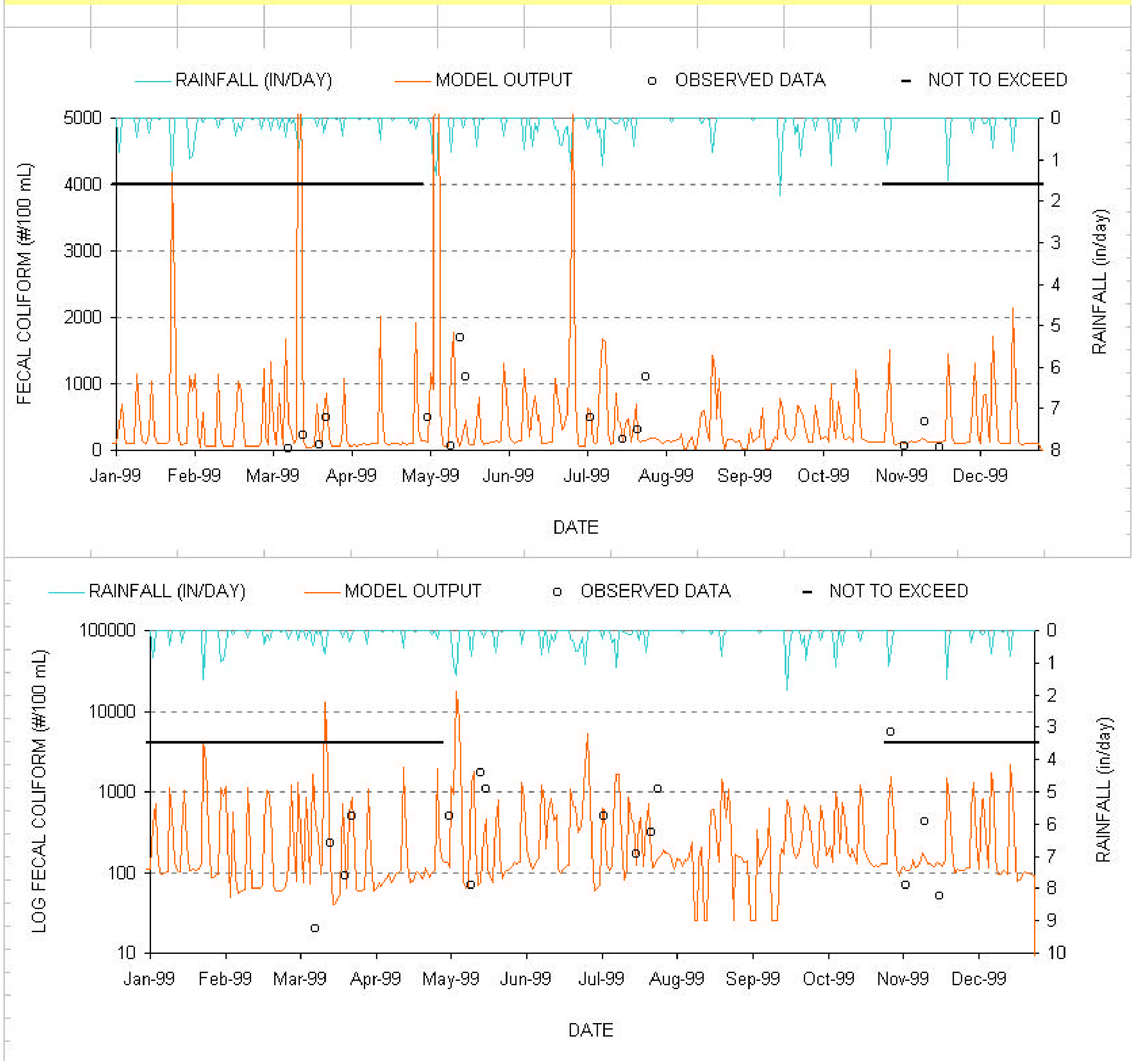


FIGURE E-3

WATER QUALITY CALIBRATION (1)

DOLESS CREEK - HEADWATERS TO DOOLITTLE CREEK

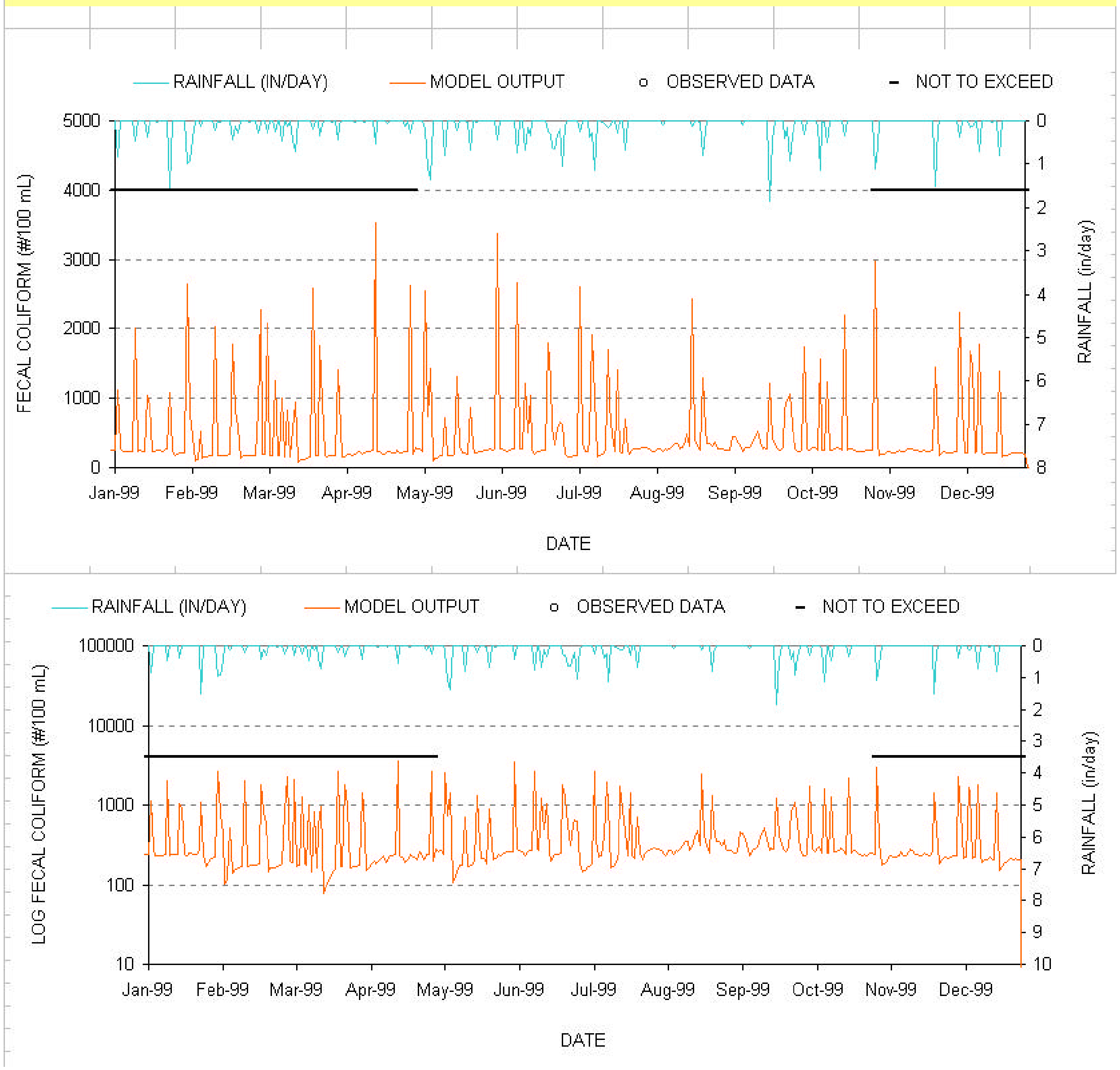
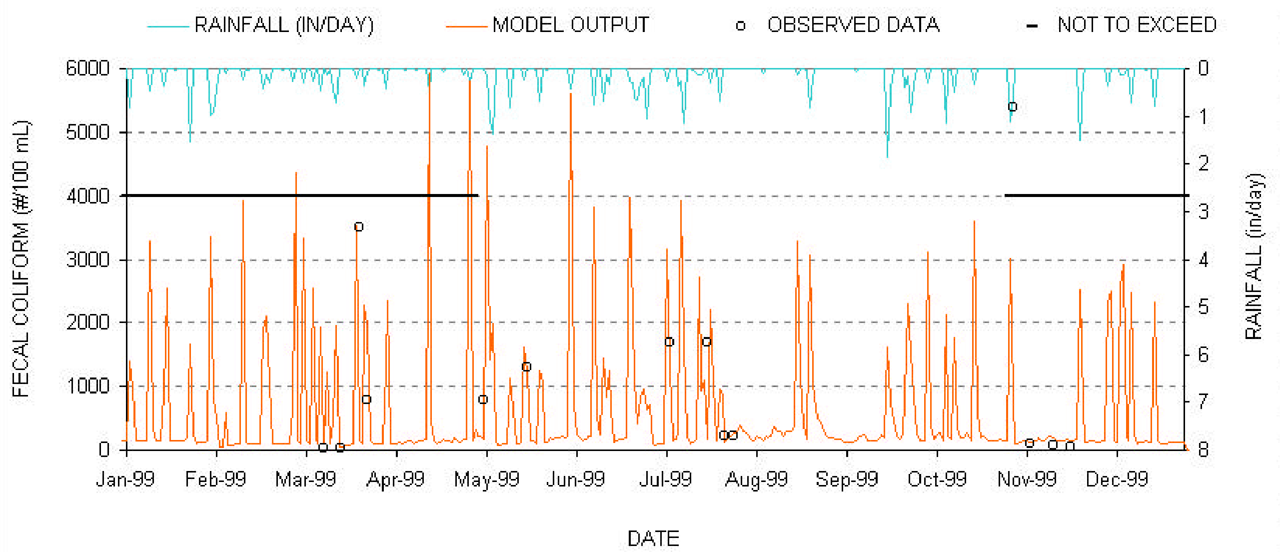


FIGURE E-4

WATER QUALITY CALIBRATION

DOOLITTLE CREEK - HEADWATERS TO SOUTH RIVER



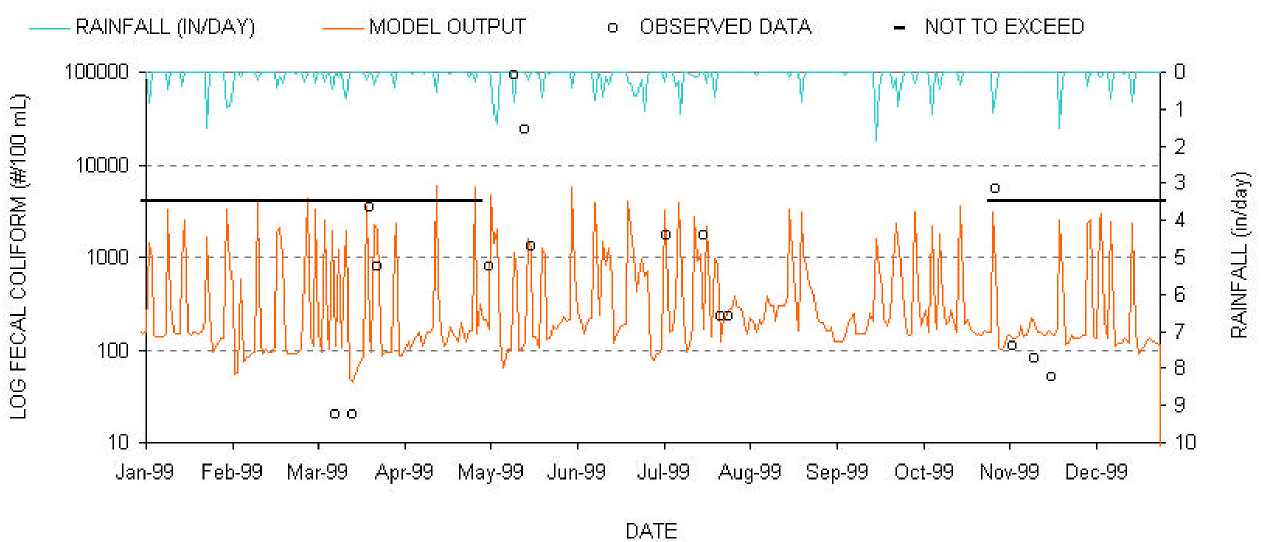


FIGURE E-5

WATER QUALITY CALIBRATION

HONEY CREEK - HEADWATERS TO SOUTH RIVER

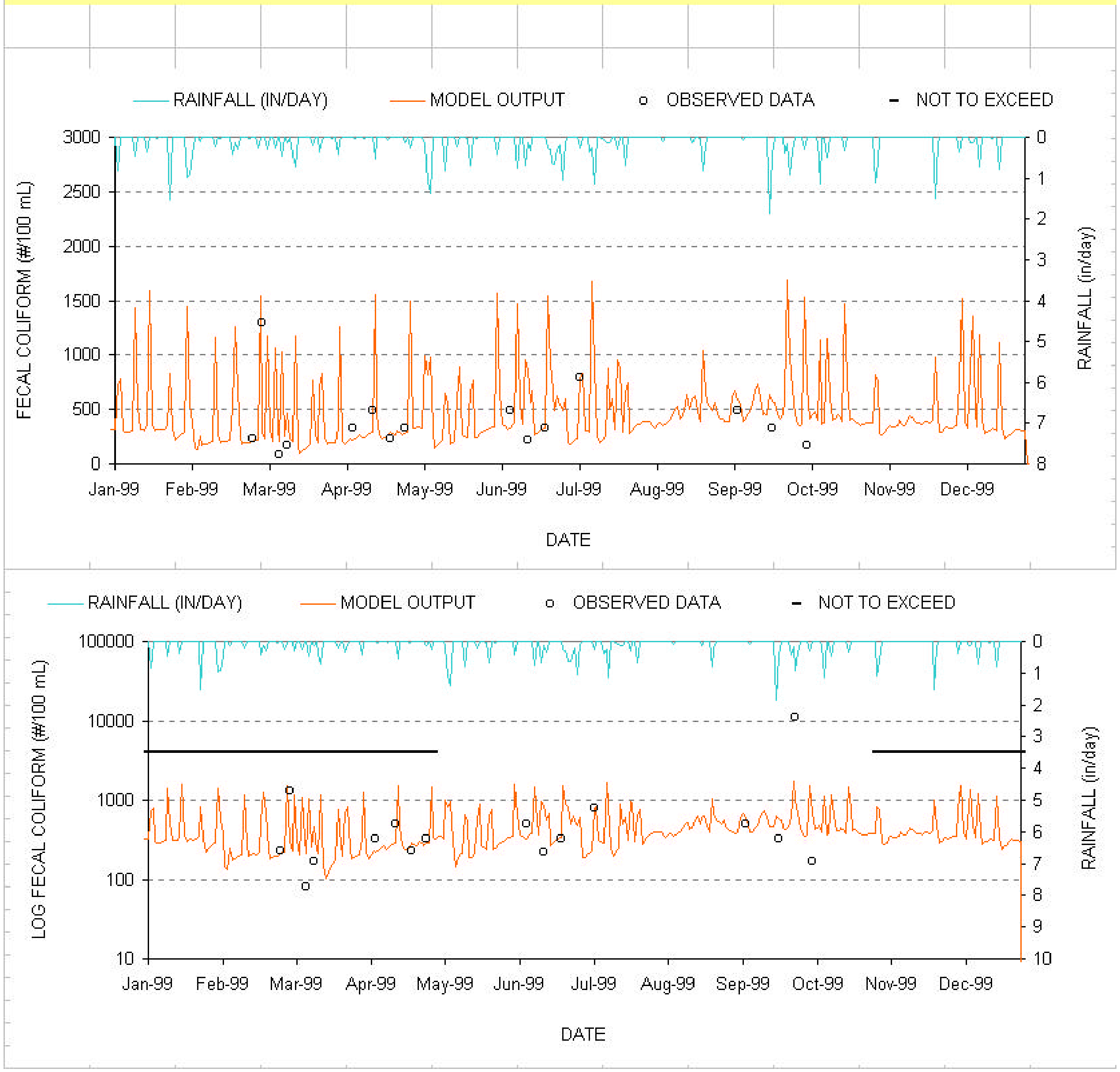


FIGURE E-6

WATER QUALITY CALIBRATION

INTRENCHMENT CREEK - HEADWATERS TO SOUTH RIVER

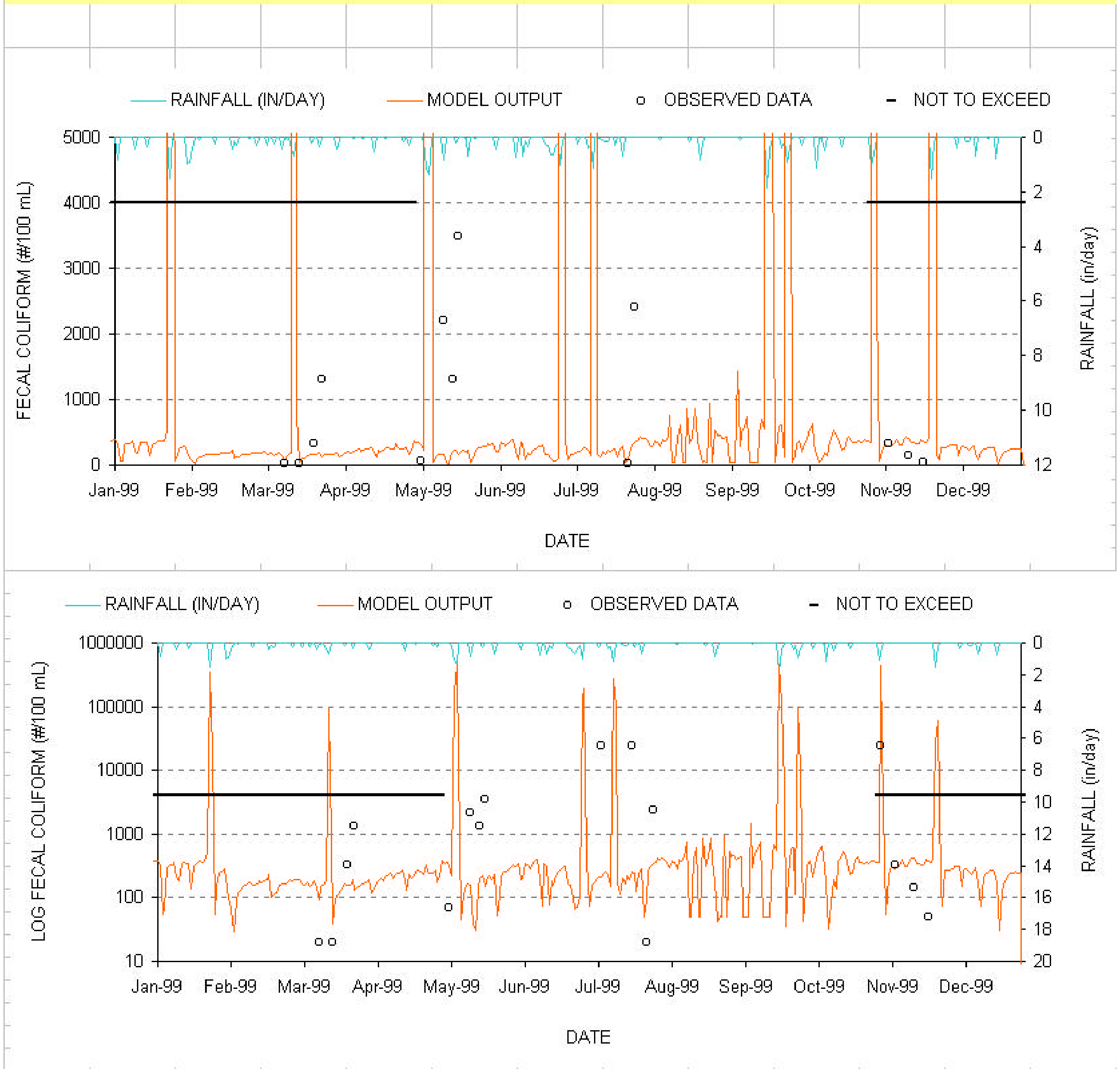


FIGURE E-7

WATER QUALITY CALIBRATION

McCLAIN BRANCH - HEADWATERS TO HONEY CREEK

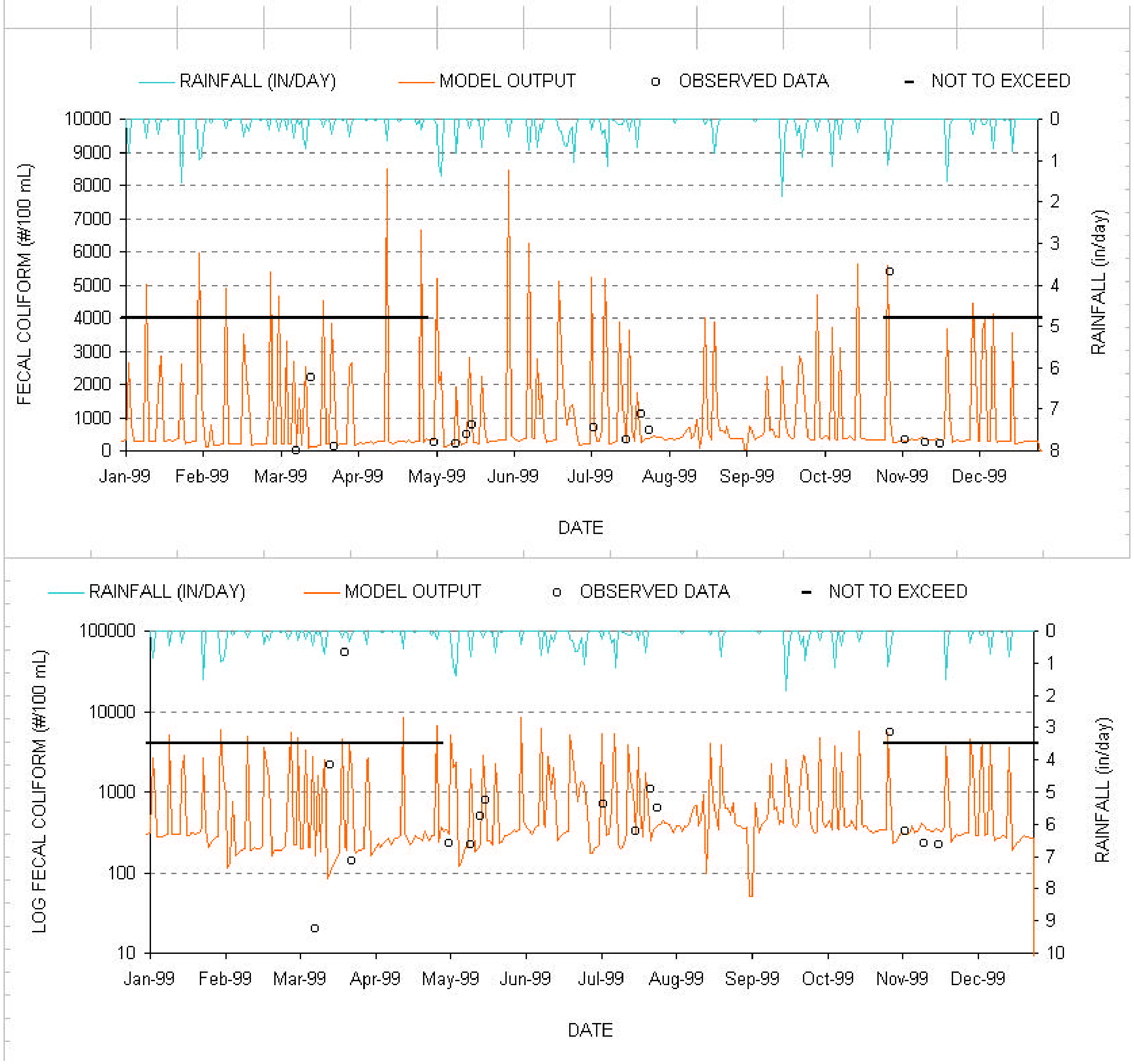


FIGURE E-8

WATER QUALITY CALIBRATION (1)

NORTH BRANCH SOUTH RIVER - (ATLANTA)

FIGURE E-9

WATER QUALITY CALIBRATION

SHOAL CREEK - HEADWATERS TO SOUTH RIVER

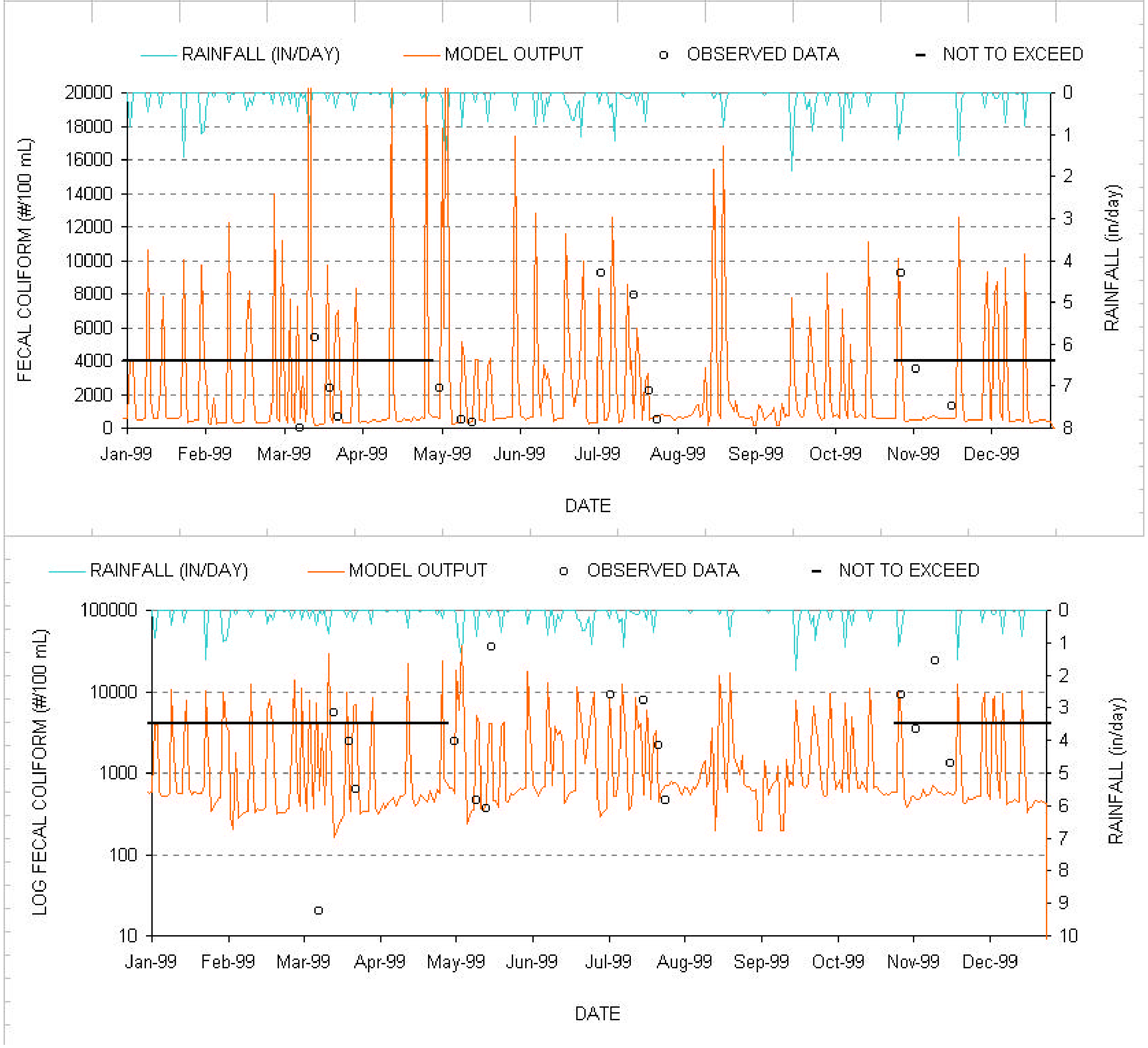
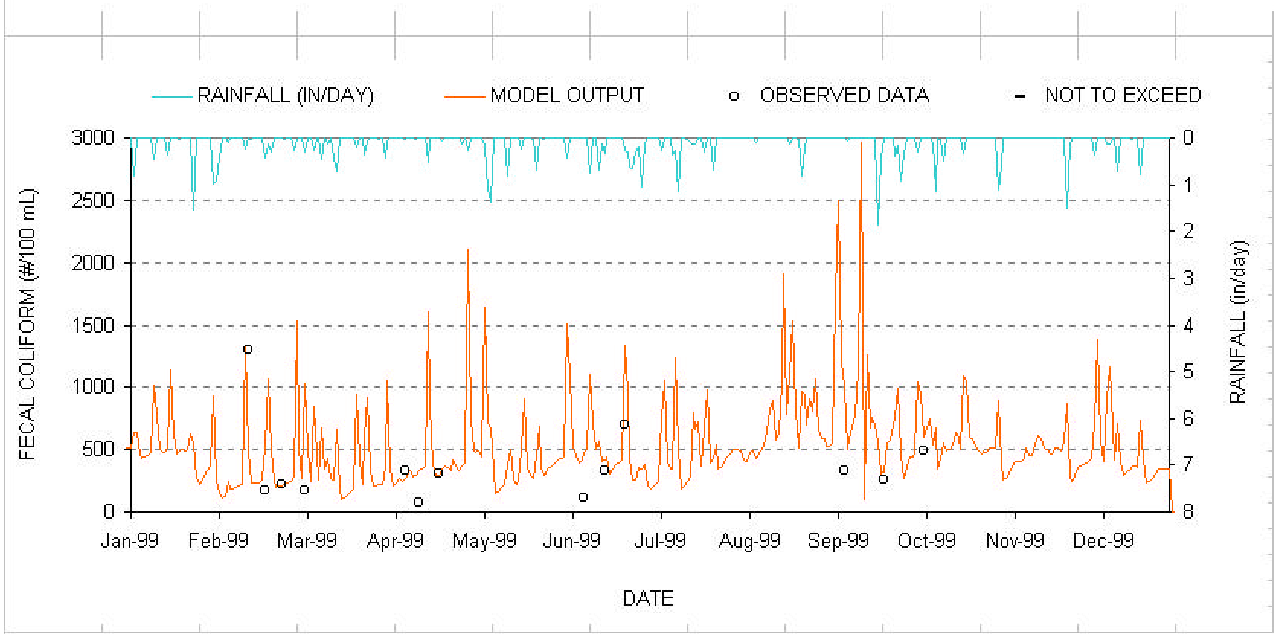


FIGURE E-10

WATER QUALTIY CALIBRATION

SNAPFINGER CREEK - DEKALB COUNTY



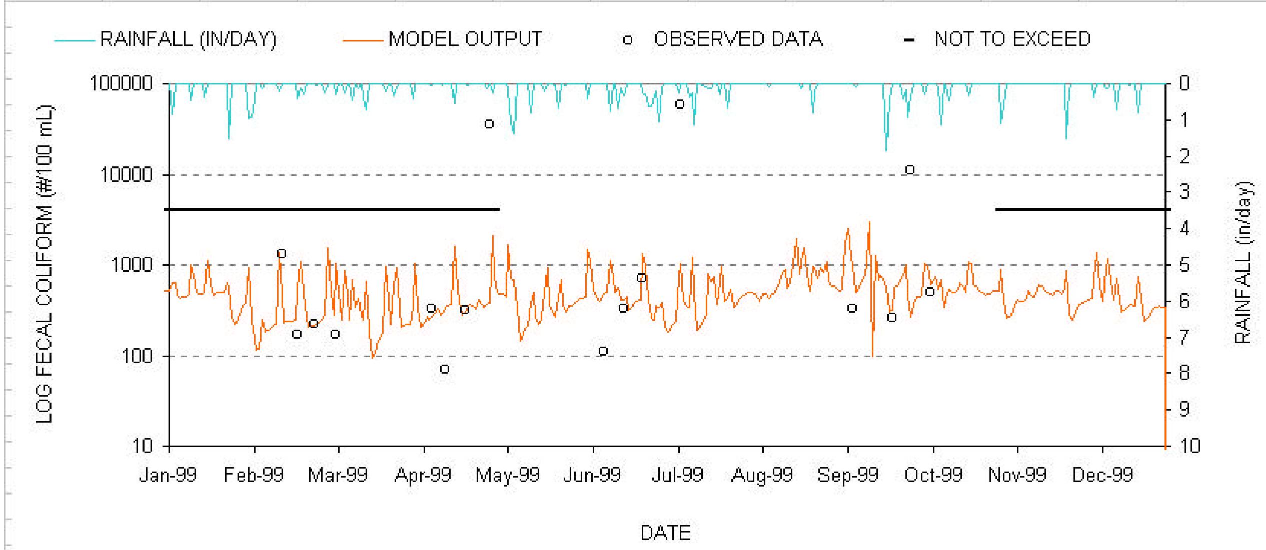
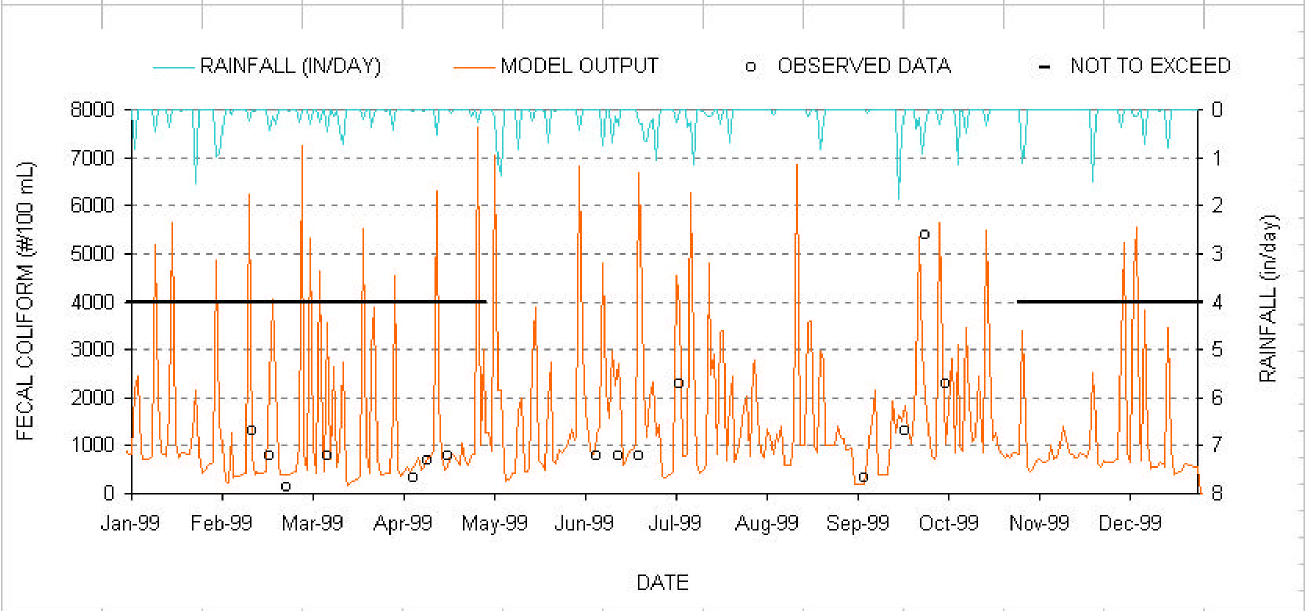
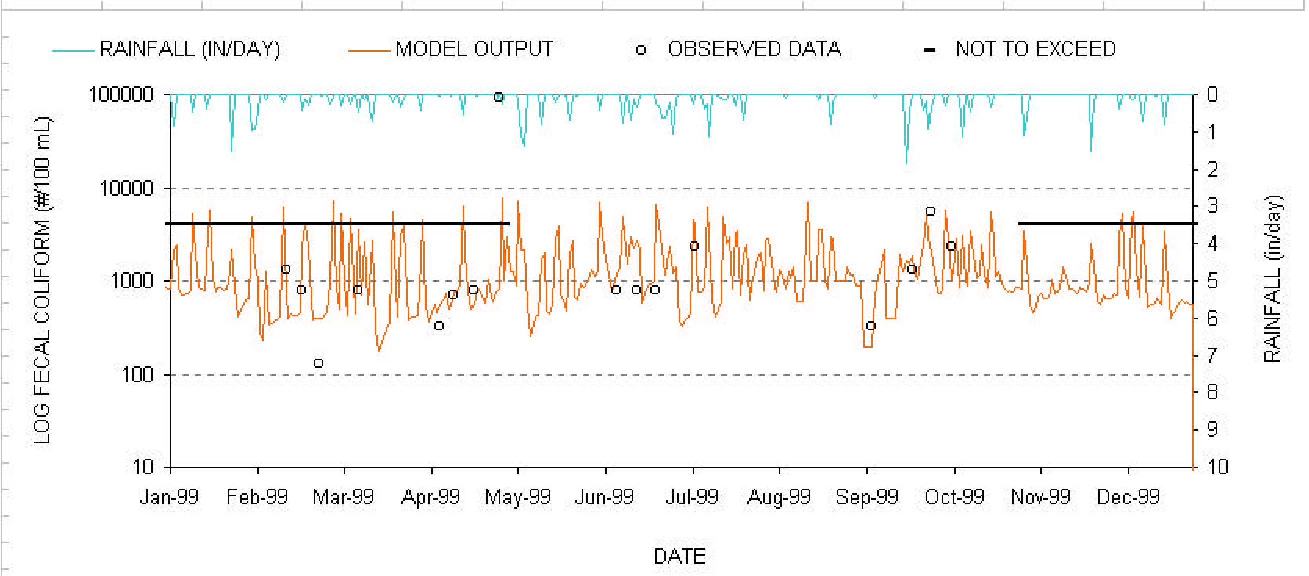


FIGURE E-11

WATER QUALITY CALIBRATION

SUGAR CREEK - U/S MEMORIAL DRIVE TO SOUTH RIVER





APPENDIX F:

SIMULATED FECAL COLIFORM

30-DAY GEOMETRIC MEANS

FOR EXISTING AND TMDL CONDITIONS

FIGURE F-1

SIMULATED FECAL COLIFORM 30-DAY GEOMETRIC MEAN

COBBS CREEK - HEADWATERS TO SHOAL CREEK

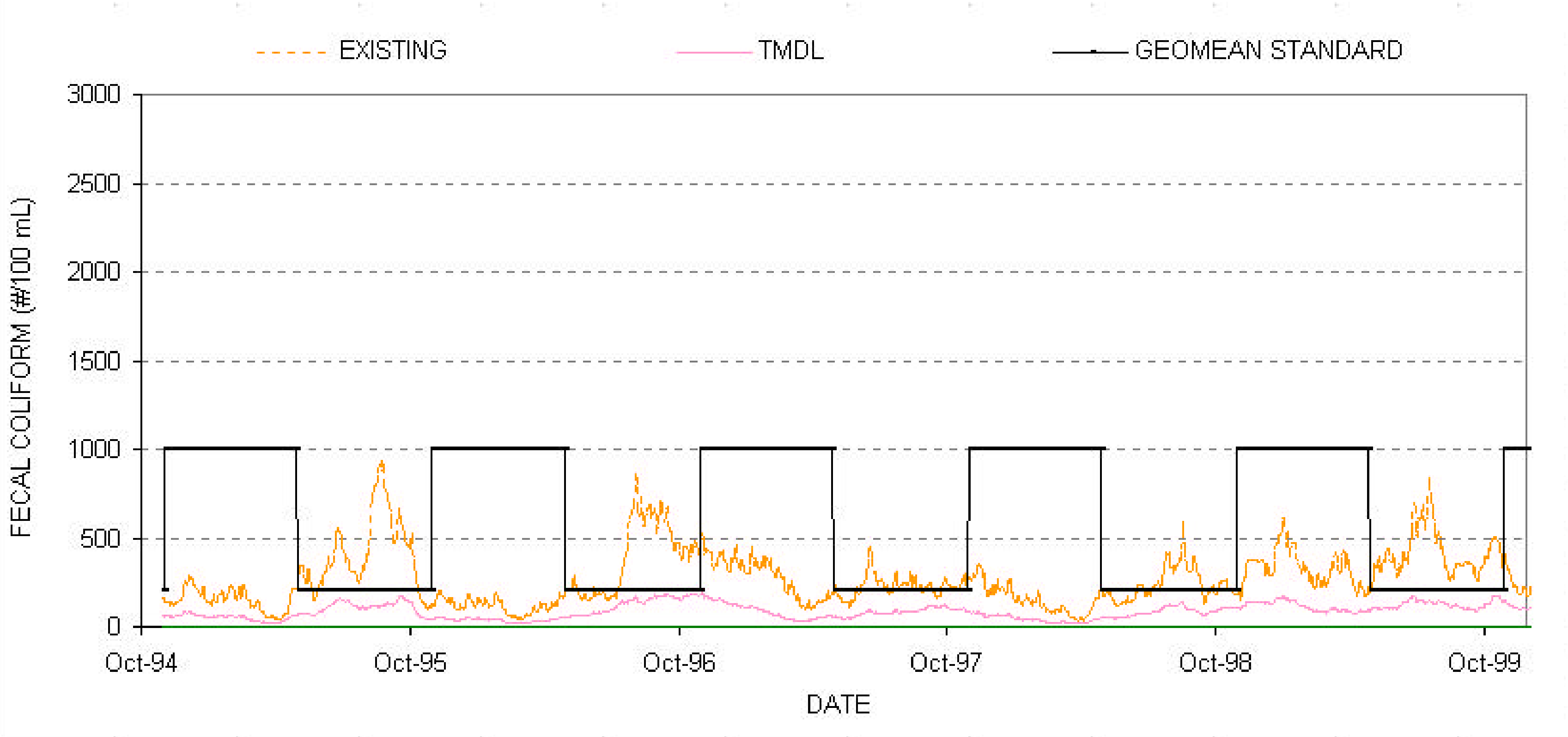


FIGURE F-2

SIMULATED FECAL COLIFORM 30-DAY GEOMETRIC MEAN

CONLEY CREEK - HEADWATERS TO SOUTH RIVER

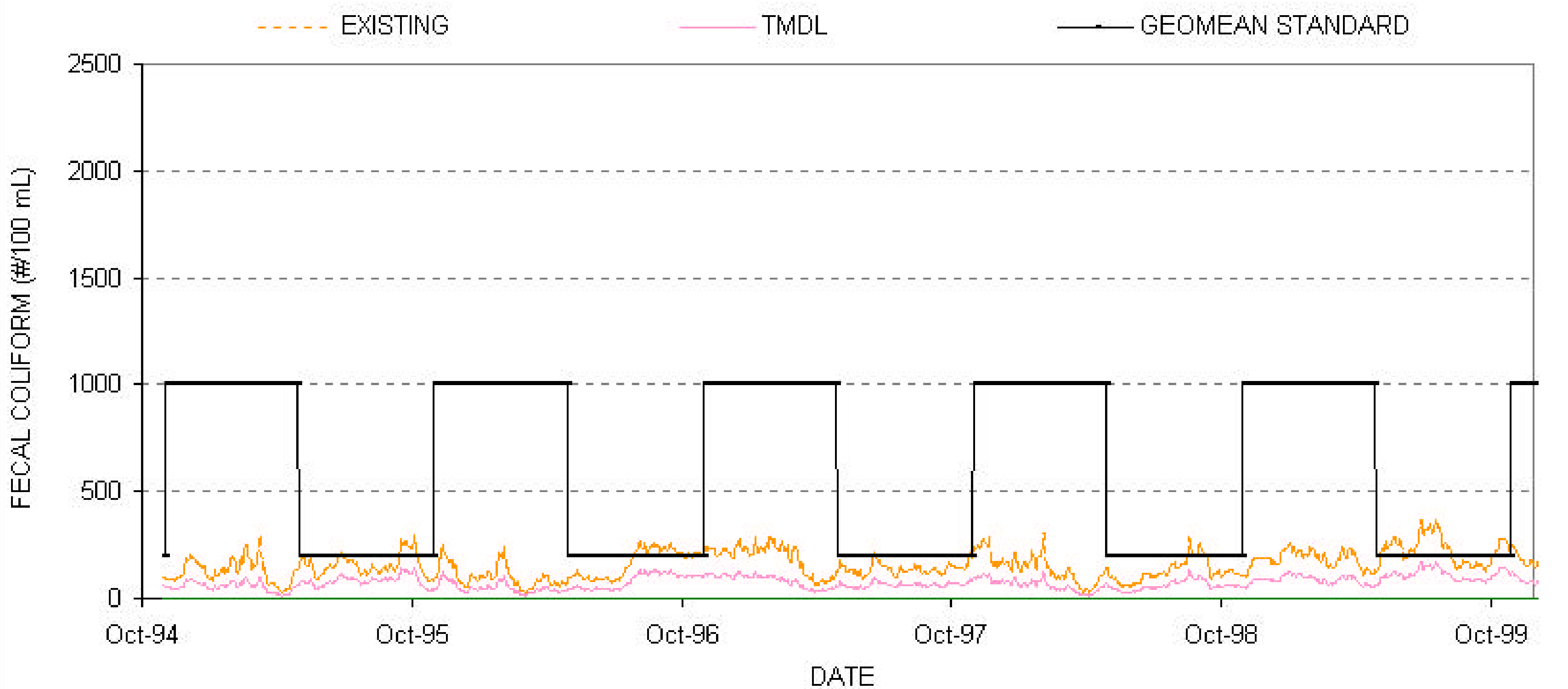


FIGURE F-3

SIMULATED FECAL COLIFORM 30-DAY GEOMETRIC MEAN

DOLESS CREEK - HEADWATERS TO DOOLITTLE CREEK

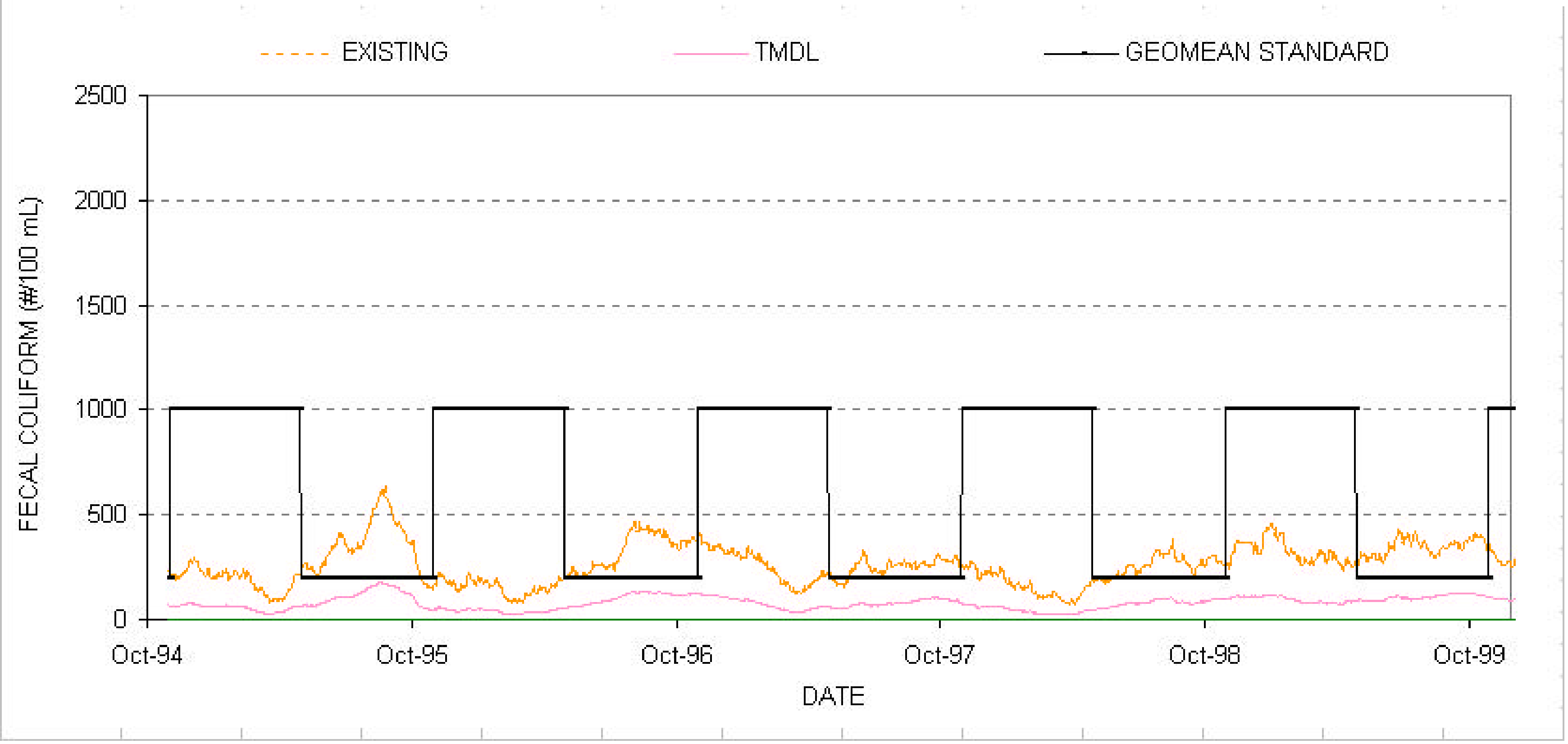


FIGURE F-4

SIMULATED FECAL COLIFORM 30-DAY GEOMETRIC MEAN

DOOLITTLE CREEK - HEADWATERS TO SOUTH RIVER

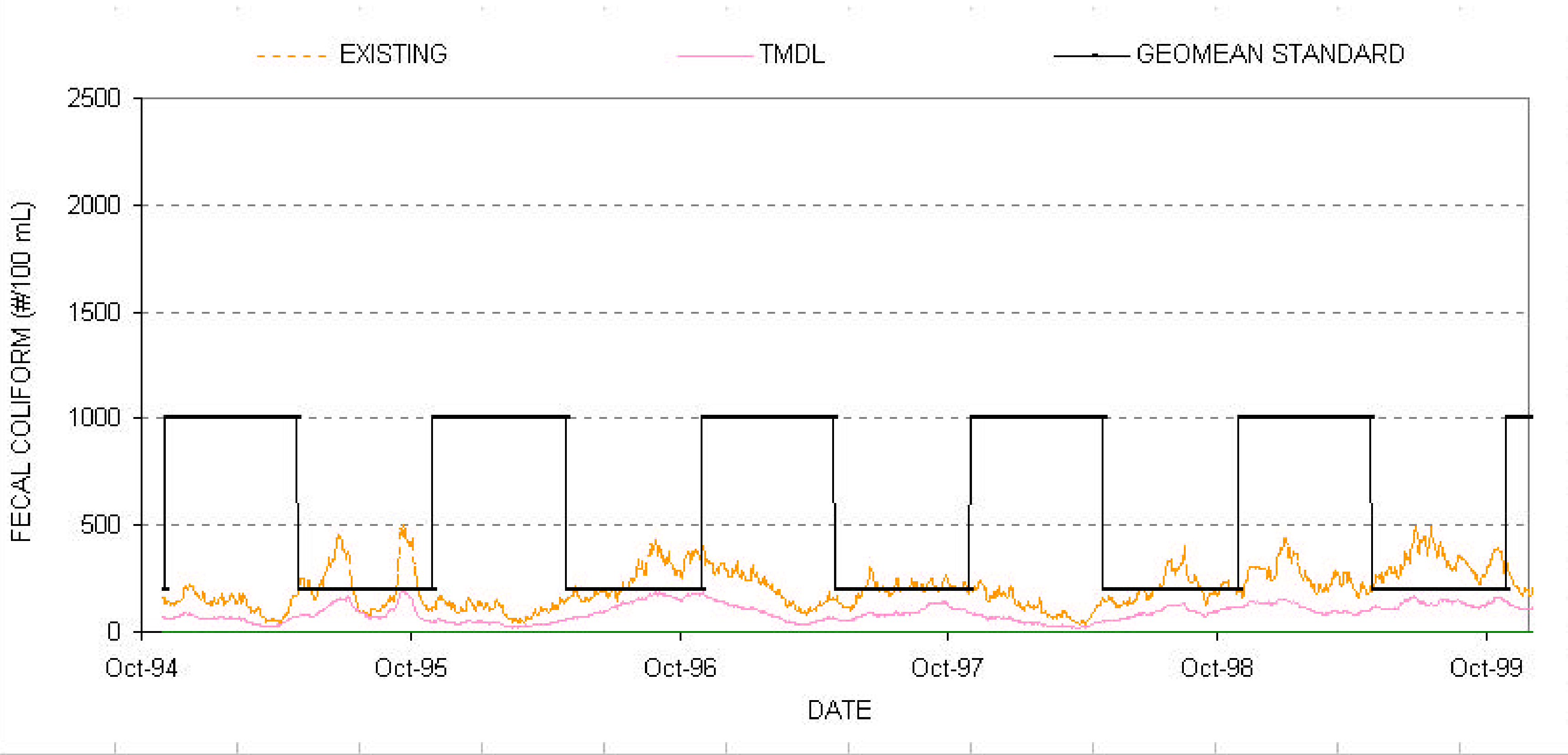


FIGURE F-5

SIMULATED FECAL COLIFORM 30-DAY GEOMETRIC MEAN

HONEY CREEK - HEADWATERS TO SOUTH RIVER

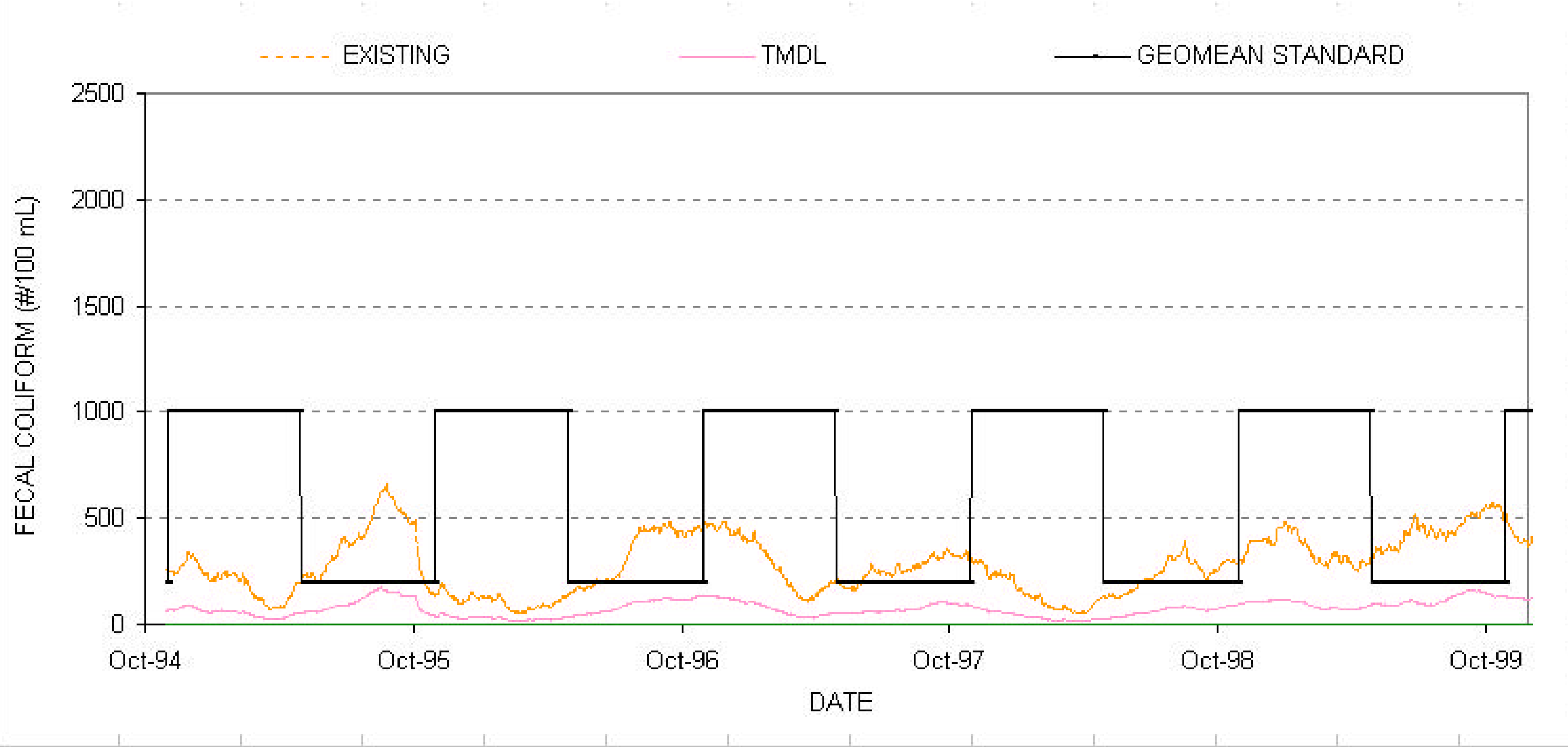


FIGURE F-6

SIMULATED FECAL COLIFORM 30-DAY GEOMETRIC MEAN

INTRENCHMENT CREEK - HEADWATERS TO SOUTH RIVER

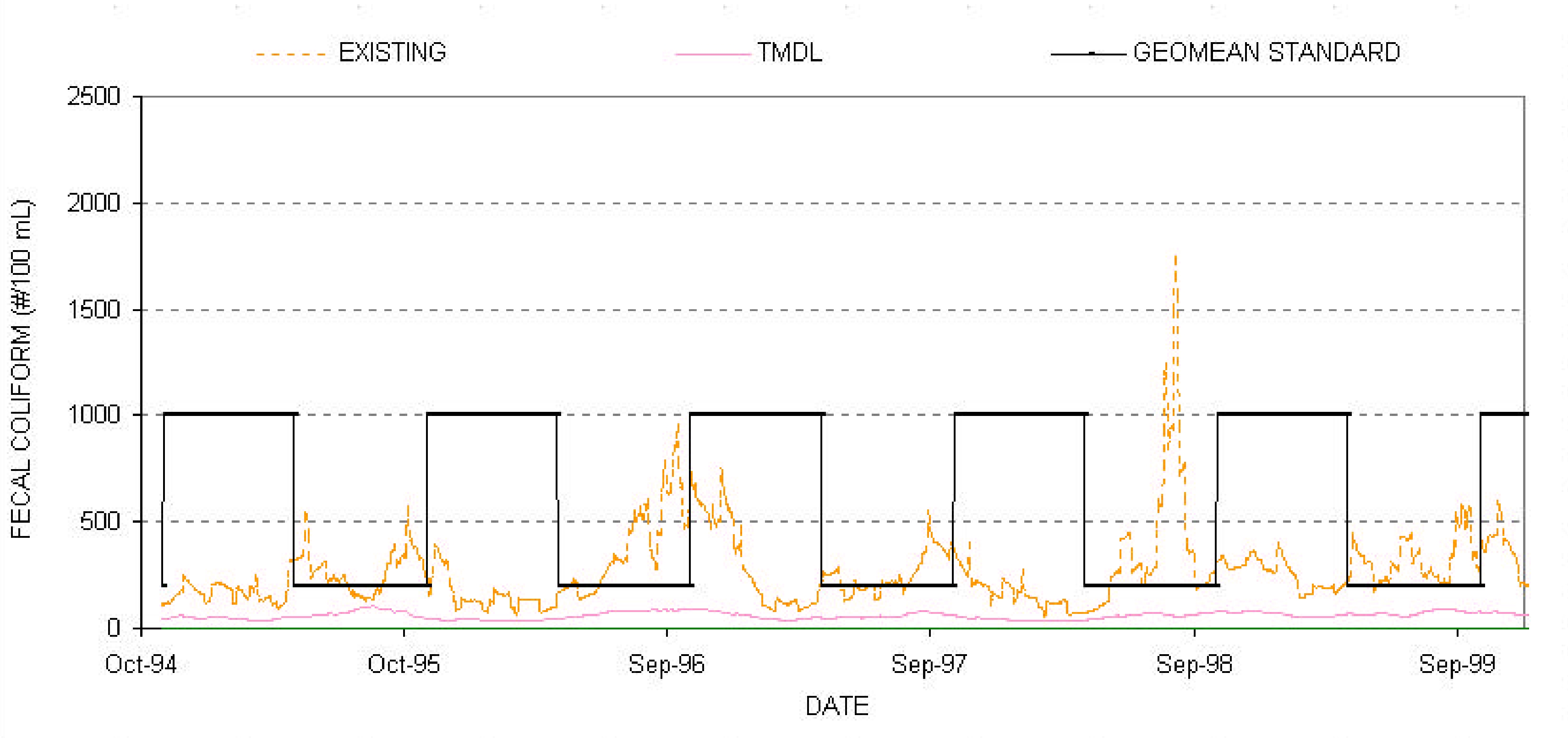


FIGURE F-7

SIMULATED FECAL COLIFORM 30-DAY GEOMETRIC MEAN

McCLAIN BRANCH - HEADWATERS TO HONEY CREEK

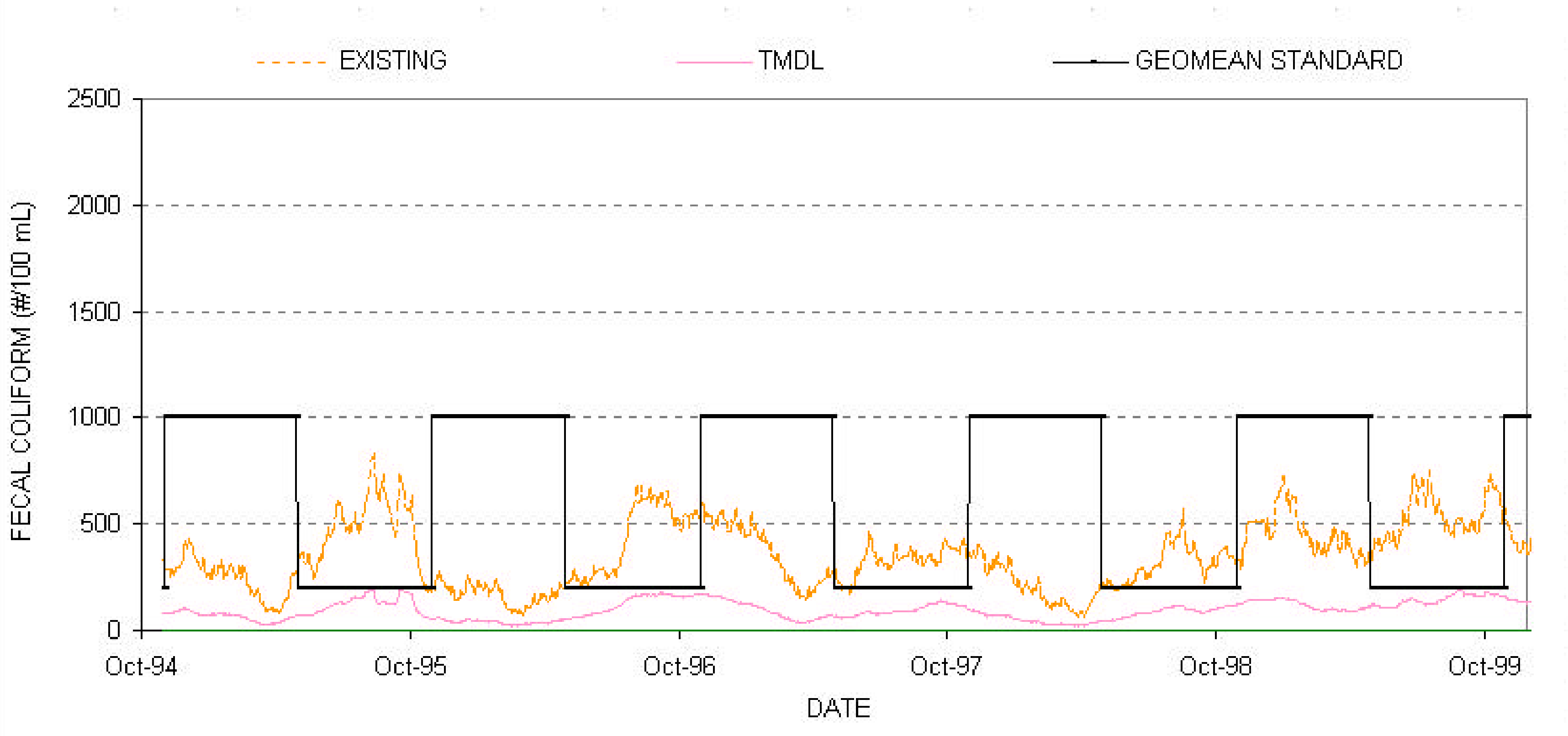


FIGURE F- 8

SIMULATED FECAL COLIFORM 30-DAY GEOMETRIC MEAN

NORTH BRANCH SOUTH RIVER - (ATLANTA)

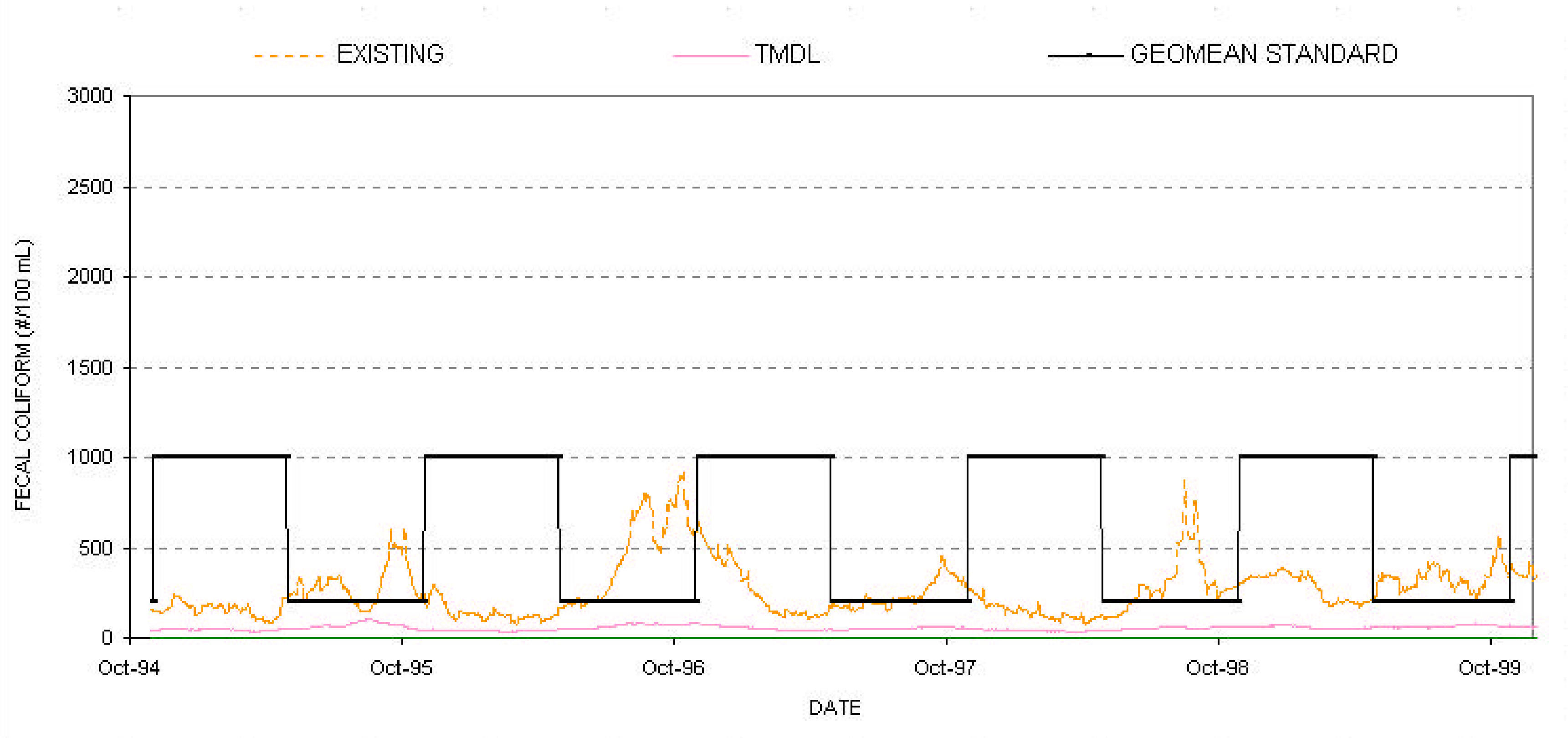


FIGURE F-9

SIMULATED FECAL COLIFORM 30-DAY GEOMETRIC MEAN

SHOAL CREEK - HEADWATERS TO SOUTH RIVER

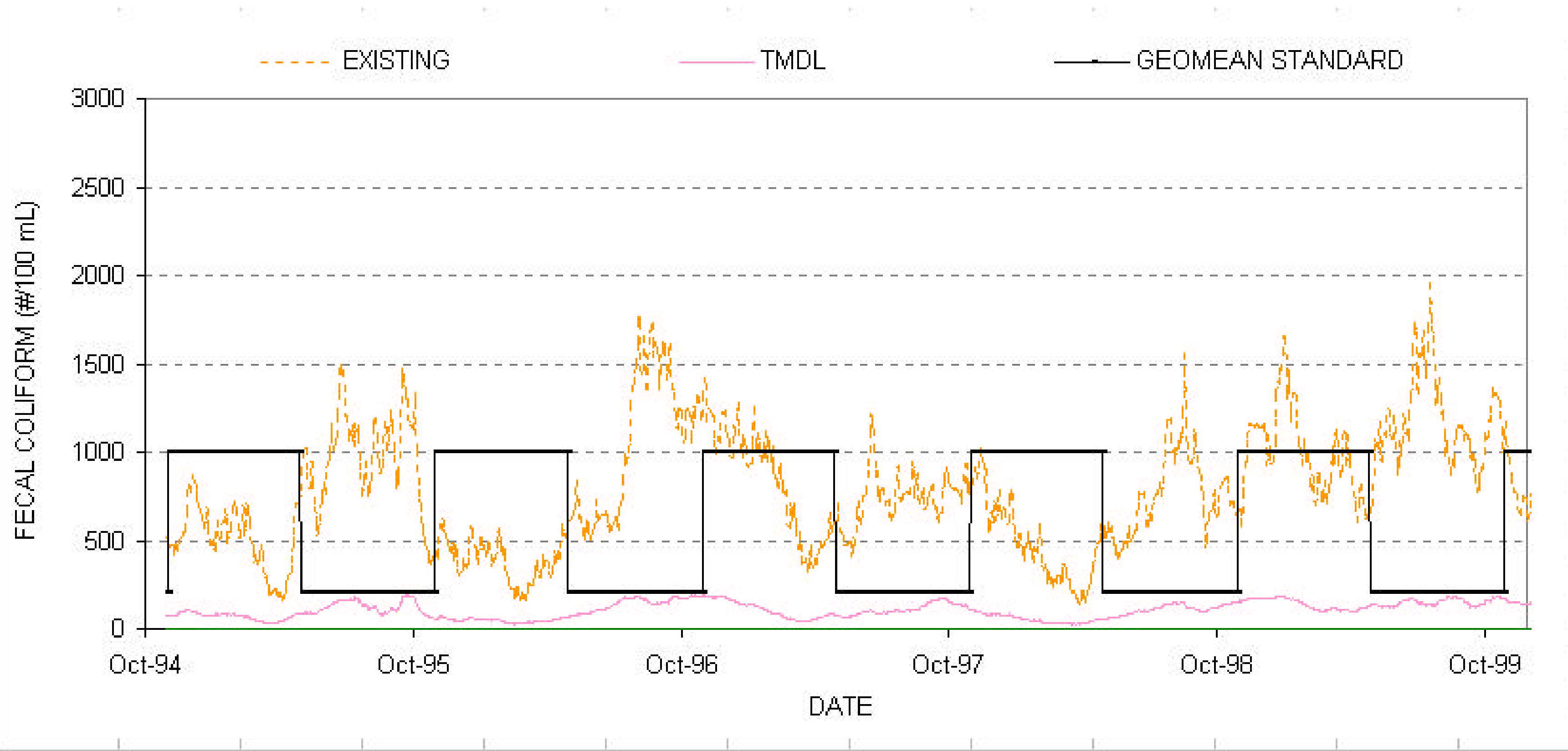


FIGURE F-10

30-DAY GEOMETRIC MEAN FECAL COLIFORM MODEL RESULTS

SNAPFINGER CREEK - DEKALB COUNTY

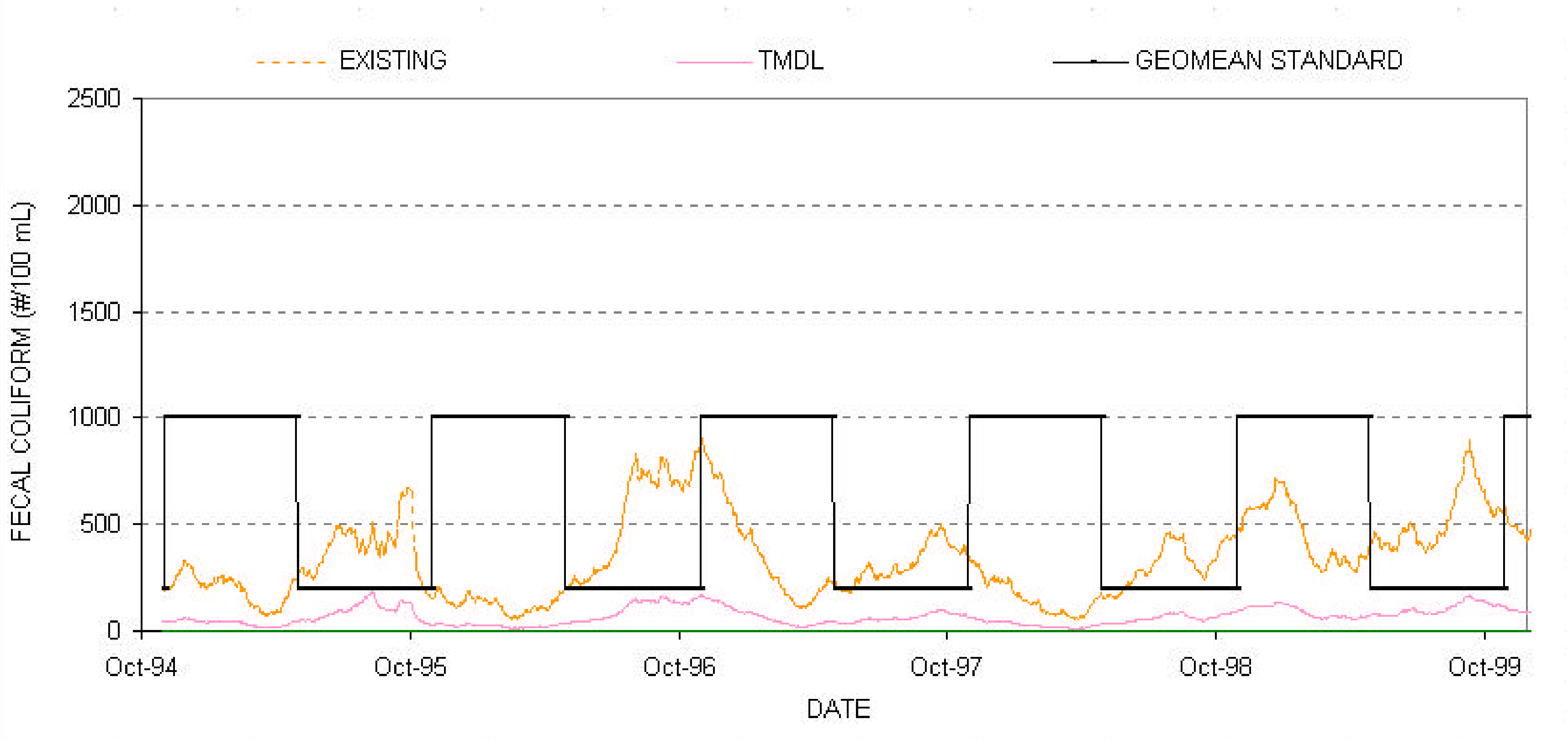
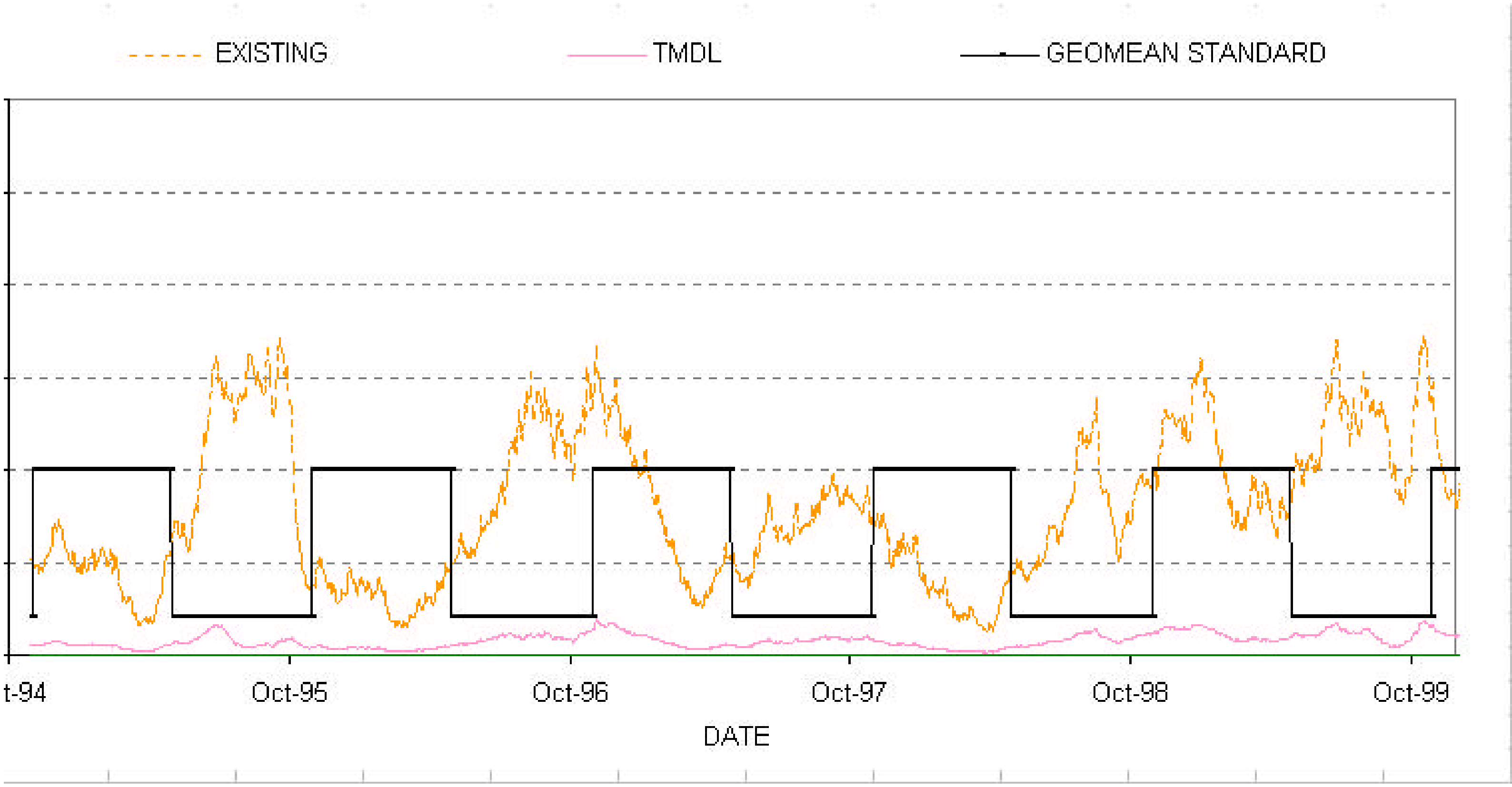


FIGURE F-11

SIMULATED FECAL COLIFORM 30-DAY GEOMETRIC MEAN

SUGAR CREEK - U/S MEMORIAL DRIVE TO SOUTH RIVER



APPENDIX G:

PROJECT INFORMATION

FOR WATERSHED MODELS

UPPER OCMULGEE RIVER BASIN (03070103)

Georgia Middle 3 Basins TMDL Development
303(d) Listed Impaired Segments for Fecal Coliform
Upper Ocmulgee Basin

Not Supporting Designated Use

STREAM	1999 MONITORING STATION	PROJECT NAME	SUBWATERSHED ID	12 DIGIT HUC ID
ALCOVY RIVER	02208182	UPOCM10	3349	030701030704
ALMAND BRANCH	02204748	UPOCM05	304a	030701030304
BIG COTTON INDIAN CREEK	02204222	UPOCM04	202a	030701030202
BIG FLAT CREEK	02208420	UPOCM11	3337	030701030706
BIG SANDY CREEK	02211199	UPOCM16	3136	030701031005
CABIN CREEK	02211380	UPOCM15	3121	030701031104
CAMP CREEK	02206235	UPOCM06	3280	030701030403
COBBS CREEK	02203873	UPOCM02A	103-SHD20	030701030103
CONLEY CREEK	02203899	UPOCM02A	103-CND20	030701030103
DOOLITTLE CREEK	02203831	UPOCM02A	102-DOO10, 102-DOO30	030701030102, 030701030102
FALLING CREEK	02212600	UPOCM17	3082	030701031305
HONEY CREEK	02204130	UPOCM03	106-HON20, 106b, 106c	030701030106, 030701030106, 030701030106
HOPKINS CREEK	02208085	UPOCM10	3370	030701030701
INTRENCHMENT CREEK	02203700	UPOCM01	INT10, INT30	030701030102, 030701030102
JACKS CREEK	02207060	UPOCM07	3256	030701030406
LITTLE HAYNES CREEK	02207430	UPOCM09	3217	030701030504
LITTLE STONE MNTN CRK	02207135	UPOCM08	3250	030701030407
LITTLE SUWANEE CREEK	02205130	UPOCM07	3310	030701030404
MCCLAIN BRANCH	02204128	UPOCM03	106a	030701030106
NO BUSINESS CREEK	02207185	UPOCM08	3238	030701030501
SHETLEY CREEK	02206000	UPOCM06	3298	030701030401
SHOAL CREEK	02208140	UPOCM10	3361	030701030701
SHOAL CREEK	02203850	UPOCM02A	103-SHD50, 103-SHD10	030701030103, 030701030103
SNAPFINGER CREEK	02203961	UPOCM02B	104-SFD20, 104-SFD50	030701030104, 030701030104

Georgia Middle 3 Basins TMDL Development

303(d) Listed Impaired Segments for Fecal Coliform
Upper Ocmulgee Basin

Not Supporting Designated Use

STREAM	1999 MONITORING STATION	PROJECT NAME	SUBWATERSHED ID	12 DIGIT HUC ID
SNAPPING SHOALS CREEK	02204776	UPOCM05	304b, 304c	030701030304, 030701030304
SOUTH RIVER	02203800, 02203630	UPOCM01	SOU310, SOU320, UTD80, SOU290, SOU300	030701030101, 030701030101, 030701030101, 030701030102, 030701030102
SOUTH RIVER	02203800, 02203630	UPOCM02A	102-260, 102-270, 102-280, 103-240, 103-250	030701030102, 030701030102, 030701030102, 030701030103, 030701030103
SOUTH RIVER	02203800, 02203630	UPOCM02B	103-CND20, 103-SOU210, 103-230	030701030103, 030701030103, 030701030103
SOUTH RIVER	02203965	UPOCM02B	130-SOU210, 107-SOU130, 105-200, 105-SOU180	030701030103, 030701030105, 030701030105, 030701030105
SOUTH RIVER	02204070, 02204149	UPOCM02B	105-SOU130, 107-SOU130	030701030105, 030701030107
SOUTH RIVER	02204070, 02204149	UPOCM03	107a, 107b	030701030107, 030701030107
STONE MOUNTAIN CREEK	02207130	UPOCM08	3247	030701030407
SUGAR CREEK	02203820	UPOCM02A	102-SGD10	030701030102
SWEETWATER CREEK	02206100	UPOCM06	3271, 3277, 3289	030701030403, 030701030403, 030701030402
SWIFT CREEK	02207200	UPOCM08	3229	030701030501
TOBESOFKEE CREEK	02213300	UPOCM18	3046, 3049	030701031402, 030701031401
TOWN BRANCH	02211110	UPOCM16	3148	030701031004
TURKEY CREEK	02206448	UPOCM07	3268	030701030406
TUSSAHAW CREEK	02209750	UPOCM12	3175, 3181	030701030903, 030701030902
WALNUT CREEK	02213055, 02213110	UPOCM19	3058, 3064	030701031604, 030701031603
WATSON CREEK	02206470	UPOCM07	3262	030701030406
WISE CREEK	02210998	UPOCM14	3163	030701031003

Georgia Middle 3 Basins TMDL Development

303(d) Listed Impaired Segments for Fecal Coliform

Upper Ocmulgee Basin

Not Supporting Designated Use

STREAM	1999 MONITORING STATION	PROJECT NAME	SUBWATERSHED ID	12 DIGIT HUC ID
YELLOW RIVER	02206500	UPOCM07	3244, 3253, 3259, 3265	030701030406, 030701030406, 030701030406, 030701030406
YELLOW RIVER	02208005	UPOCM09	3196, 3199, 3202	030701030603, 030701030601, 030701030601
YELLOW WATER CREEK	02210780	UPOCM14	3166	030701031001

Georgia Middle 3 Basins TMDL Development

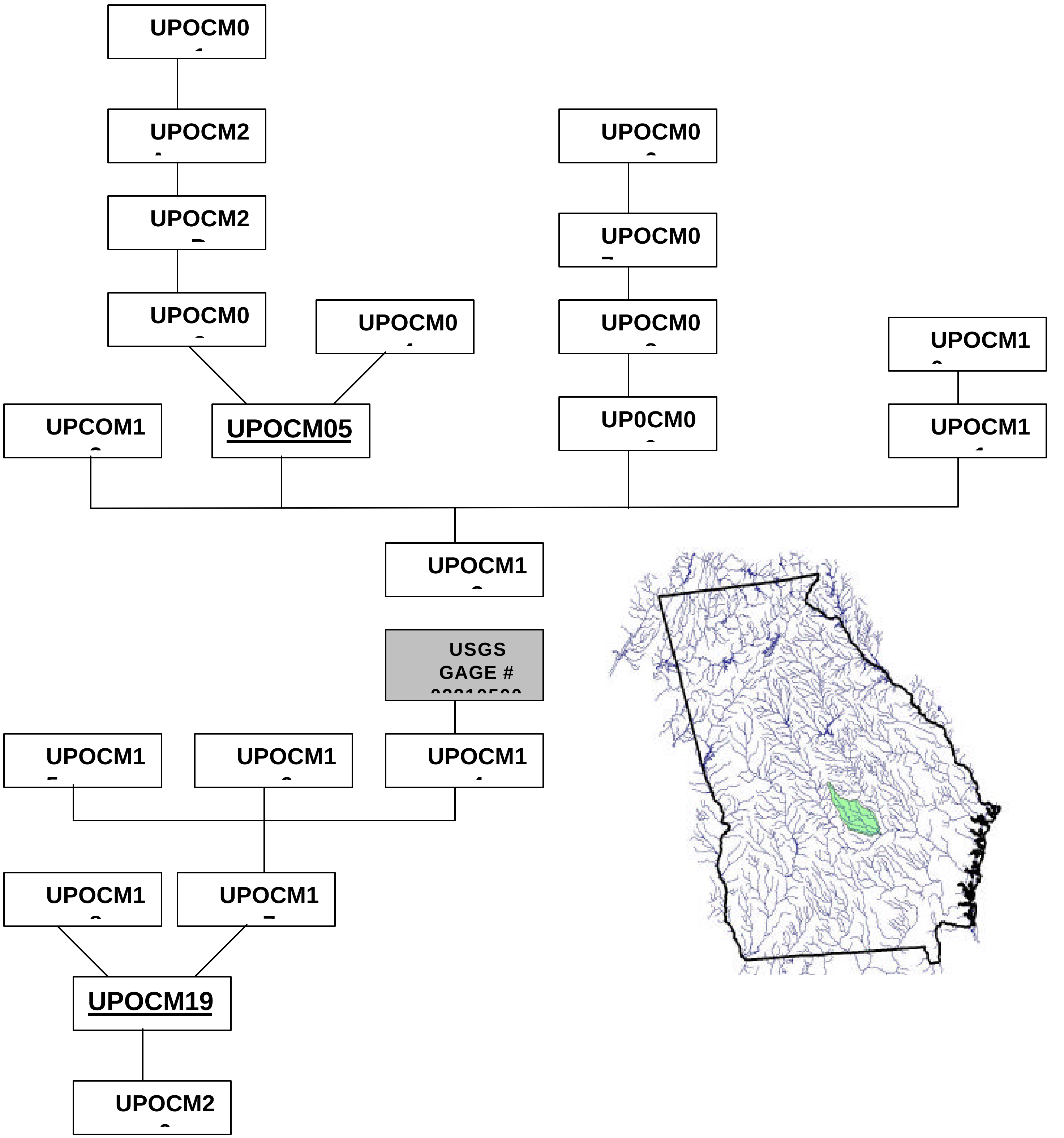
303(d) Listed Impaired Segments for Fecal Coliform

Upper Ocmulgee Basin

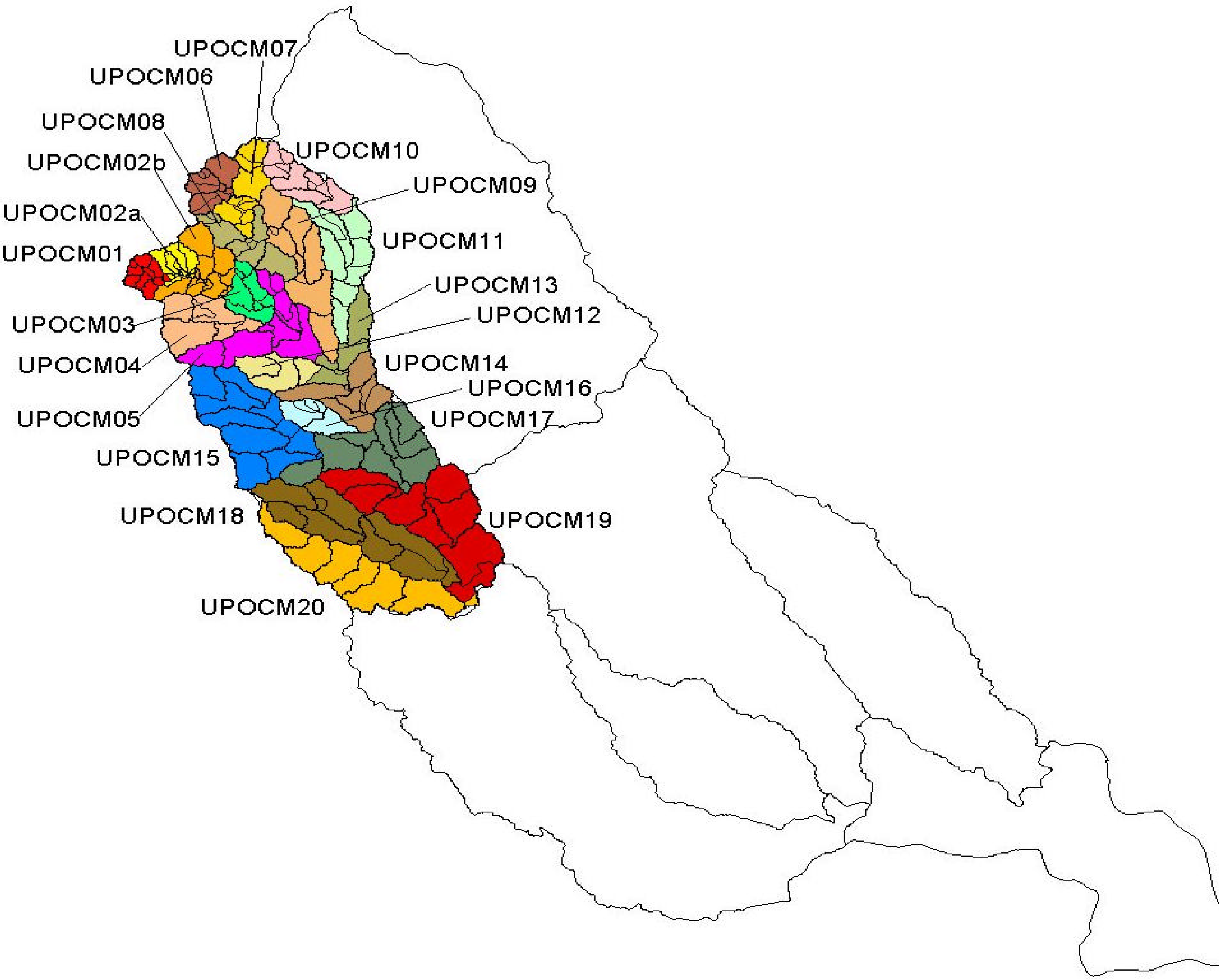
Partially Supporting Designated Use

STREAM	1999 MONITORING STATION	PROJECT NAME	SUBWATERSHED ID	12 DIGIT HUC ID
BEAVER RUIN CREEK	NA	UPOCM06	3292	030701030401
BIG HAYNES CREEK	NA	UPOCM09	3223	030701030503
BIG HAYNES CREEK	02207412	UPOCM09	3220	030701030505
BIG HAYNES CREEK	02207420	UPOCM09	3211	030701030505
BROMOLOW CREEK	02206030	UPOCM06	3295, 3301	030701030401, 030701030401
CEDAR CREEK	02208180	UPOCM10	3355	030701030704
DOLESS CREEK	NA	UPOCM02A	102-DOO20	030701030102
JACKSON CREEK	02206300	UPOCM06	3274, 3283	030701030403, 030701030403
LAKE JACKSON	NA	UPOCM13	3169, 3187, 3190, 3193	030701030903, 030701030903, 030701030305, 030701030804
NORTH BRANCH SOUTH RIVER	NA	UPOCM01	SOU350 MCD20	030701030101, 030701030101
OCMULGEE RIVER	02212950	UPOCM19	3055	030701031602
OCMULGEE RIVER	02213700	UPOCM19	3022	030701031605
PEW CREEK	02205522	UPOCM07	3304	030701030405
ROCKY CREEK	02213660, 02213675	UPOCM18	3031	030701031406
SOUTH RIVER	02204520	UPOCM05	301a, 301b	030701030301, 030701030301
SOUTH RIVER	02204810	UPOCM05	305a	030701030305
TOBESOFKEE CREEK	02213560	UPOCM18	3028	030701031406
YELLOW RIVER	02207300	UPOCM08	3208, 3226, 3232, 3235	030701030502, 030701030501, 030701030501, 030701030501

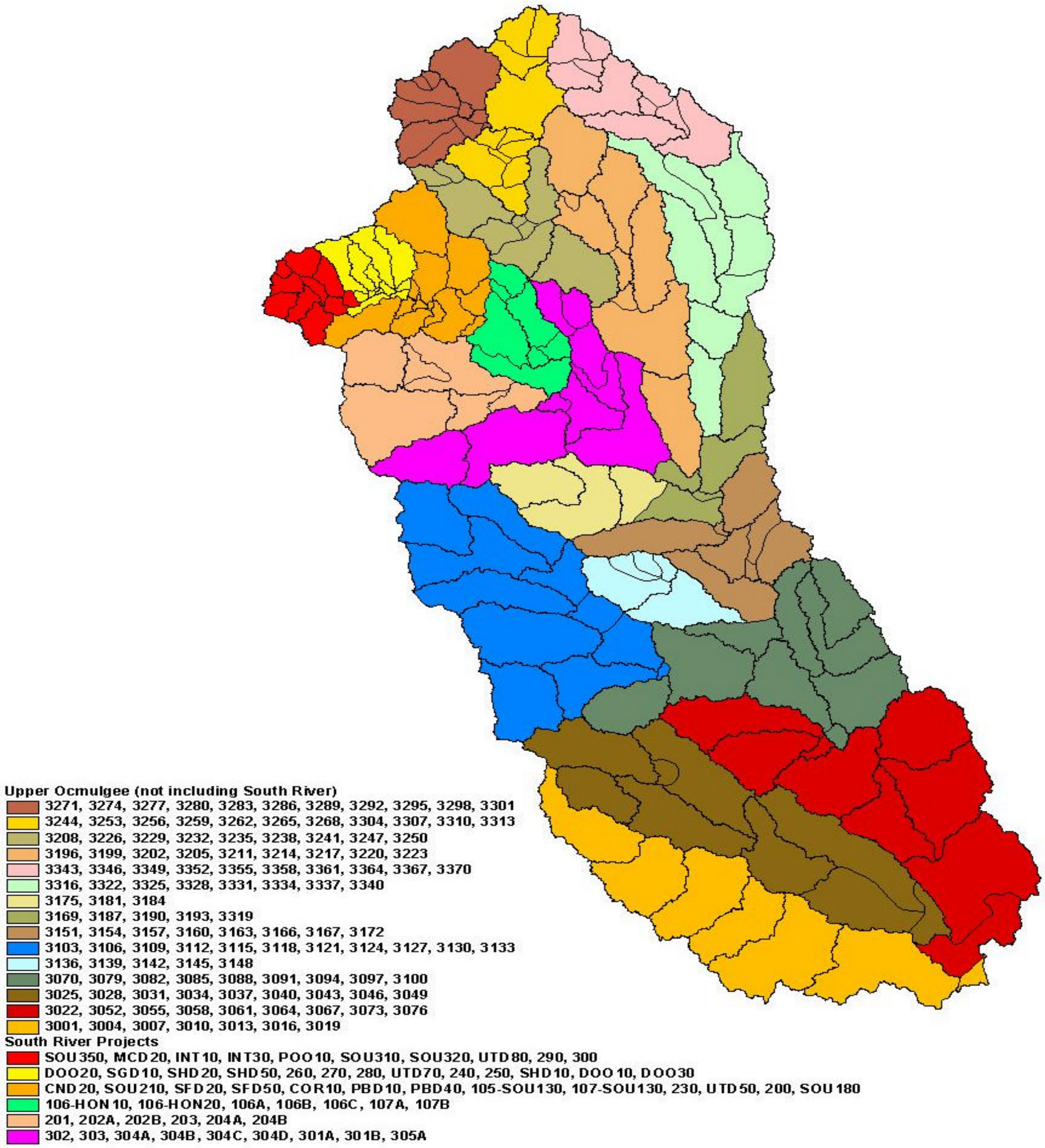
Modeling Schematic of the Upper Ocmulgee River Basin (03070103)



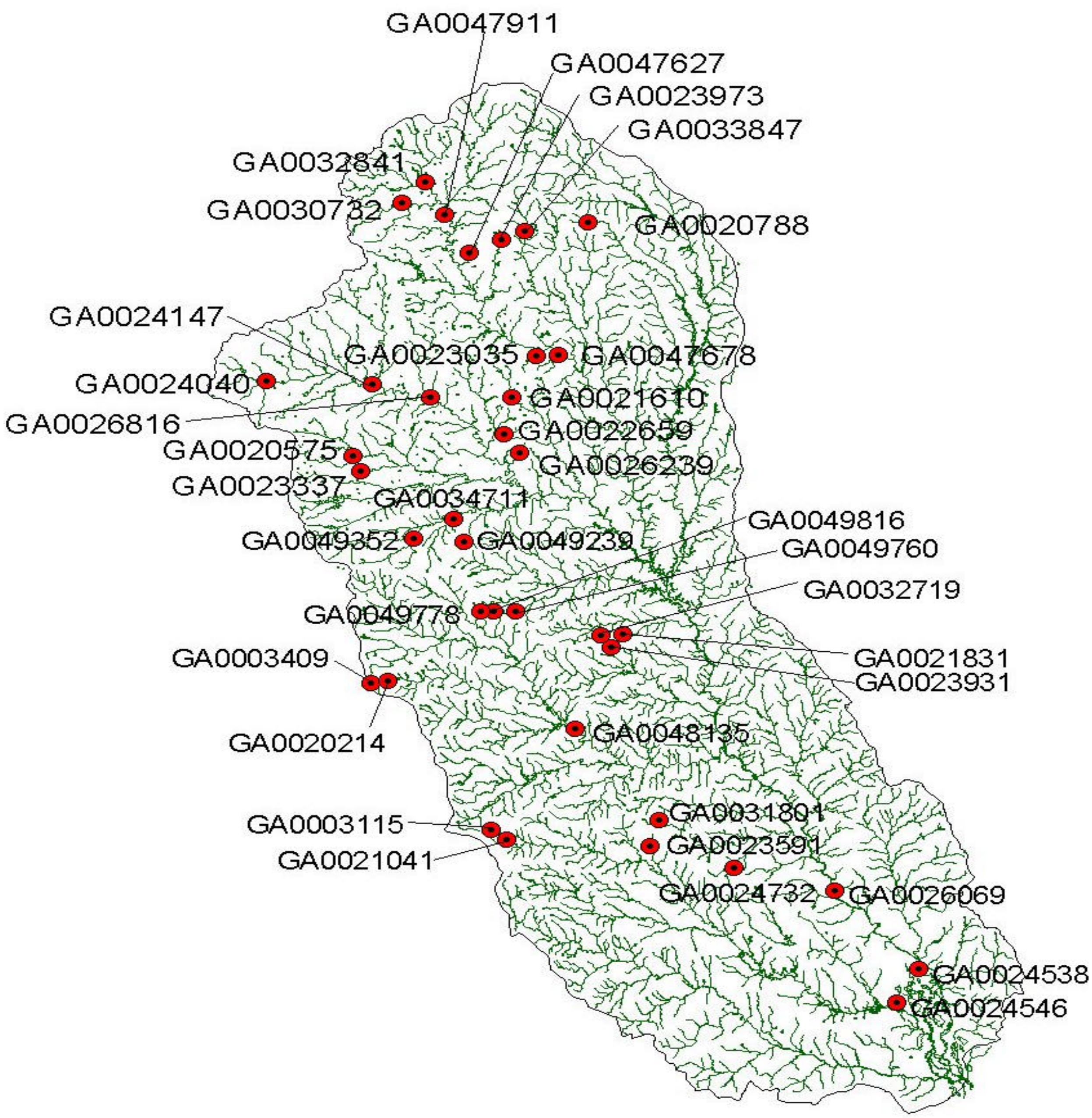
Upper Ocmulgee River Basin Projects



Upper Ocmulgee River Basin
Delineated Subwatersheds for Modeling



Upper Ocmulgee River Basin
Active Permitted Point Sources for Modeling



Upper Ocmulgee River Basin
1999 Water Quality Monitoring Stations

GA Middle 3 Basins TMDL Development – HSPF Project Summary Sheet
Project Name: UPOCM1

Listed Segments in Project

Subwatershed ID	Listed Segment
SOU350	North Br South River (FC)
MCD20	North Br South River (FC)
INT10	Intrenchment Creek (FC)
INT30	Intrenchment Creek (FC)
POO10	NA
SOU310	South River (FC)
SOU320	South River (FC)
UTD80	South River (FC)
SOU290	South River (FC)
SOU300	South River (FC)

Notes:
DO = Dissolved Oxygen
FC = Fecal Coliform

Point Sources in Project

Sub. ID	NPDES ID and Name	Receiving Stream	Permitted Flow (cfs)
SOU350			
MCD20	McDaniel CSO	North Br South River	NA
INT10			
INT30	Intrenchment CSO Custer CSO	Intrenchment Creek	NA NA
POO10			
SOU310			
SOU320	GA0024040 ATLANTA (SOUTH RIVER WRC)	South River	0.001
UTD80			
SOU290			
SOU300			

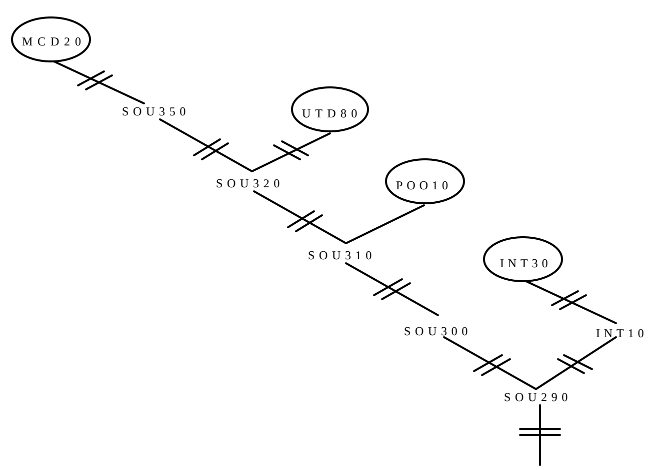
Projects Entered as Point Sources

Subwatershed ID	Project Name

WDM Stations Assigned in Project

Subwatershed ID	WDM Station
SOU350	Atl Hartsfield
MCD20	Atl Hartsfield
INT10	Atl Hartsfield
INT30	Atl Hartsfield
POO10	Atl Hartsfield
SOU310	Atl Hartsfield
SOU320	Atl Hartsfield
UTD80	Atl Hartsfield
SOU290	Atl Hartsfield
SOU300	Atl Hartsfield

Schematic of Project Subwatersheds
(Modeling Framework)



Batch Files to Run for Project
Upocm1CSOs.bat

GA Middle 3 Basins TMDL Development – HSPF Project Summary Sheet
Project Name: UPOCM2A

Listed Segments in Project

Subwatershed ID	Listed Segment
102-DOO20	Doless Creek (FC and DO)
102-SGD10	Sugar Creek (FC)
103-SHD20	Cobbs Creek (FC)
103-SHD50	Shoal Creek (FC)
102-260	South River (FC)
102-270	South River (FC)
102-280	South River (FC)
102-UTD70	NA
103-240	South River (FC)
103-250	South River (FC)
103-SHD10	Shoal Creek (FC)
102-DOO10	Doolittle Creek (FC)
102-DOO30	Doolittle Creek (FC)

Notes:
DO = Dissolved Oxygen
FC = Fecal Coliform

Point Sources in Project

Sub. ID	NPDES ID and Name	Receiving Stream	Permitted Flow (cfs)
102-DOO20			
102-SGD10			
103-SHD20			
103-SHD50			
102-260			
102-270			
102-280			
102-UTD70			
103-240			
103-250			
103-SHD10			
102-DOO10			
102-DOO30			

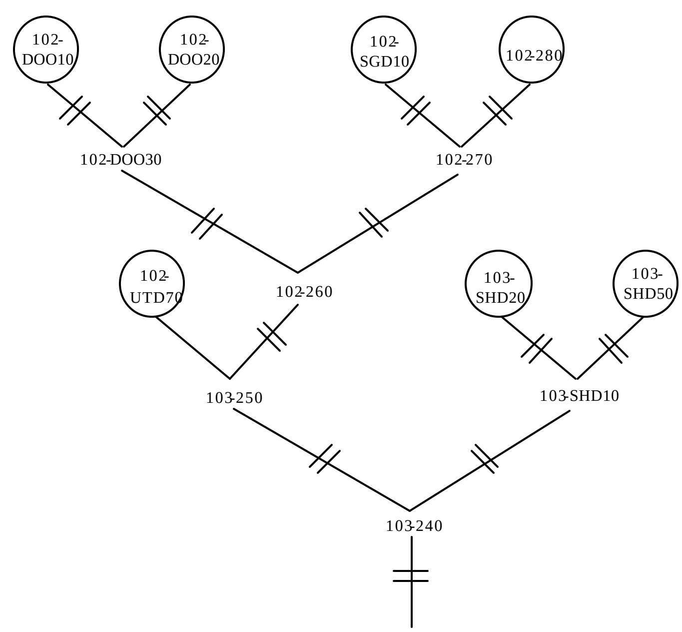
Projects Entered as Point Sources

Subwatershed ID	Project Name
102-280	UPOCM1

WDM Stations Assigned in Project

Subwatershed ID	WDM Station
102-DOO20	Atl Hartsfield
102-SGD10	Atl Hartsfield
103-SHD20	Atl Hartsfield
103-SHD50	Atl Hartsfield
102-260	Atl Hartsfield
102-270	Atl Hartsfield
102-280	Atl Hartsfield
102-UTD70	Atl Hartsfield
103-240	Atl Hartsfield
103-250	Atl Hartsfield
103-SHD10	Atl Hartsfield
102-DOO10	Atl Hartsfield
102-DOO30	Atl Hartsfield

Schematic of Project Subwatersheds (Modeling Framework)



Batch Files to Run for Project
LinkUpocm1toUpocm2A.bat

GA Middle 3 Basins TMDL Development – HSPF Project Summary Sheet
Project Name: UPOCM2B

Listed Segments in Project

Subwatershed ID	Listed Segment
103-CND20	Conley Creek (FC)
103-SOU210	South River (FC)
104-SFD20	Snapfinger Creek (FC)
104-SFD50	Snapfinger Creek (FC)
105-COR10	NA
105-PBD10	NA
105-PBD40	NA
105-SOU130	South River (FC)
107-SOU130	South River (FC)
103-230	South River (FC)
103-UTD50	NA
105-200	South River (FC)
105-SOU180	South River (FC)

Notes:
DO = Dissolved Oxygen
FC = Fecal Coliform

Point Sources in Project

Sub. ID	NPDES ID and Name	Receiving Stream	Permitted Flow (cfs)
103-CND20			
103-SOU210	GA0024147 DeKalb Co Snapfinger WPCP	Snapfinger Creek	55.8
104-SFD20			
104-SFD50			
105 COR10	GA0049808 Henry Co Panola Woods WPCP	Corn Creek	0.001
105-PBD10			
105-PBD40			
105-SOU130	**GA0026816 DeKalb Co Polebridge WPCP**	South River	31.0

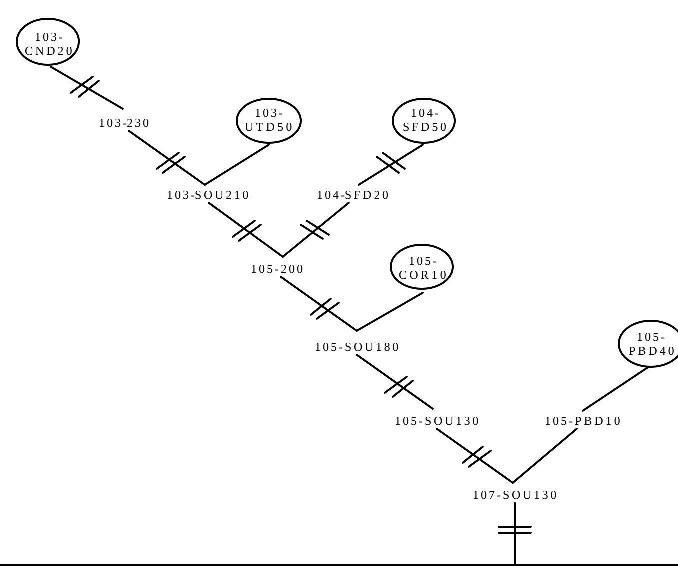
Projects Entered as Point Sources

Subwatershed ID	Project Name
103-230	UPOCM2A

WDM Stations Assigned in Project

Subwatershed ID	WDM Station
103-CND20	Atl Hartsfield
103-SOU210	Atl Hartsfield
104-SFD20	Atl Hartsfield
104-SFD50	Atl Hartsfield
105-COR10	Atl Hartsfield
105-PBD10	Atl Hartsfield
105-PBD40	Atl Hartsfield
105-SOU130	Atl Hartsfield
107-SOU130	Atl Hartsfield
103-230	Atl Hartsfield
103-UTD50	Atl Hartsfield
105-200	Atl Hartsfield
105-SOU180	Atl Hartsfield

Schematic of Project Subwatersheds (Modeling Framework)



Batch Files to Run for Project
LinkUpocm2AtoUpocm2B.bat

GA Middle 3 Basins TMDL Development – HSPF Project Summary Sheet
Project Name: UPOCM3

Listed Segments in Project

Subwatershed ID	Listed Segment
106-HON10	NA
106-HON20	Honey Creek (FC)
106a	McClain Branch (FC)
106b	Honey Creek (FC)
106c	Honey Creek (FC)
107a	South River (FC)
107b	South River (FC)

Notes:
DO = Dissolved Oxygen
FC = Fecal Coliform

Point Sources in Project

Sub. ID	NPDES ID and Name	Receiving Stream	Permitted Flow (cfs)
106-HON10			
106-HON20			
106a	GA0022659 Rockdale Co	Honey Creek	0.465
106b			
106c			
107a			
107b	GA0026239 Rockdale Co	South River	0.341

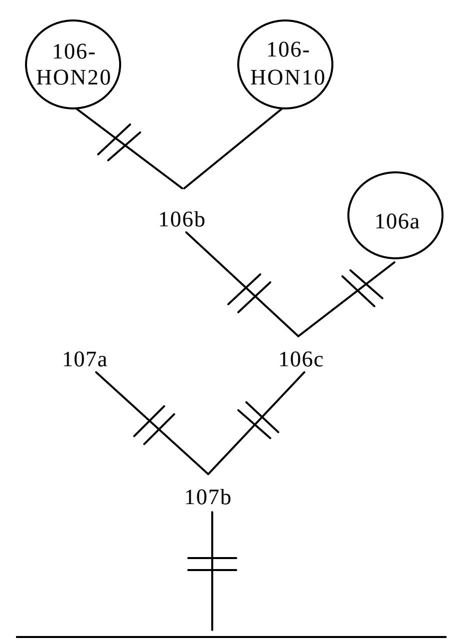
Projects Entered as Point Sources

Subwatershed ID	Project Name
107a	UPOCM2B

WDM Stations Assigned in Project

Subwatershed ID	WDM Station
106-HON10	Atl Hartsfield
106-HON20	Atl Hartsfield
106a	Atl Hartsfield
106b	Atl Hartsfield
106c	Atl Hartsfield
107a	Atl Hartsfield
107b	Atl Hartsfield

Schematic of Project Subwatersheds (Modeling Framework)



Batch Files to Run for Project
LinkUpocm2BtoUpocm3.bat