

**TOTAL MAXIMUM DAILY LOAD (TMDL) DEVELOPMENT**

*For Lead, Copper and Mercury*

*In*

**TAYLORS CREEK**

**In the Ogeechee River Basin**

(HUC 3060203)

Liberty County, Georgia



**APPROVAL PAGE**  
for Copper, Lead and Mercury in  
Taylors Creek, GA

Georgia's final 1998 303(d) list identified Taylors Creek, Hinesville, GA as not supporting its designated use, with the pollutants of concern being copper, lead and mercury. This total maximum daily load (TMDL) is being established pursuant to the 1998 Georgia 303(d) list and the Consent Decree in the Georgia TMDL Lawsuit.

The Total Maximum Daily Load for Taylors Creek for Lead, Copper and Mercury is given below.

Since a TMDL is the sum of wasteload allocations (WLA) plus load allocation (LA) and a margin of safety (MOS), the TMDL can be represented as:

$$\text{TMDL} = \text{WLA} + \text{LA} + \text{MOS}$$

<b>Pollutant</b>	<b>TMDL (kg/day)</b>	<b>WLA (kg/day)</b>	<b>LA (kg/day)</b>	<b>MOS</b>
Lead	0.04	0.04	0	Implicit
Copper	0.219	0.219	0	Implicit
Mercury	0.0004	0.0004	0	Implicit

APPROVED BY:

\_\_\_\_\_  
Robert F. McGhee, Director

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Date

Water Management Division

EPA-Region 4

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## Introduction

Section 303(d) of the Clean Water Act (CWA) as Amended by the Water Quality Act of 1987, Public Law 100-4, and the United States Environmental Protection Agency's (USEPA/EPA) Water Quality Planning and Management Regulations [Title 40 of the Code of Federal Regulation (40 CFR), Part 130] require each State to identify those waters within its boundaries not meeting water quality standards applicable to the waters' designated uses. The identified waters are prioritized based on the severity of pollution with respect to designated use classifications. Total maximum daily loads (TMDLs) for all pollutants violating or causing violation of applicable water quality standards are established for each identified water. Such loads are established at levels necessary to implement the applicable water quality standards with seasonal variations and margins of safety. The TMDL process establishes the allowable loadings of pollutants or other quantifiable parameters for a water body, based on the relationship between pollution sources and in-stream water quality conditions, so that states can establish water-quality based controls to reduce pollution from both point and nonpoint sources and restore and maintain the quality of their water resources (USEPA, 1991).

## Problem Definition

Georgia's final 1998 Section 303(d) list identified the Tributary to Taylors Creek, as not supporting its designated use with the pollutants of concern being lead, copper and mercury. The tributary is located approximately 30 miles from Georgia's Atlantic coast and is a tributary to the Canoochee River, which flows into the Savannah River just east of the City of Hinesville/Fort Stewart area. The only pollutant point source is the Hinesville/Fort Stewart municipal wastewater treatment plant. The Hinesville/Fort Stewart treatment plant does not have an effluent limit for lead, copper or mercury in their National Pollutant Discharge Elimination System (NPDES) permit. This TMDL will be used to set the Total Maximum Daily Load for lead, copper and mercury.

The TMDL is being established pursuant to EPA commitments in the October 1997 Consent Decree in the

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Georgia TMDL lawsuit. These conditions include a requirement that TMDLs be proposed by August 30, 1999, for each water on the 1998 303(d) list that is impacted by a National Pollutant Discharge Elimination System (NPDES) permitted point source or point sources, and is located in the Savannah/Ogeechee Basins.

Based recent data collected by the GA EPD (Appendix C), lead, copper and mercury are no longer found in sufficient quantities in the stream for the stream to be considered impaired. Because the Tributary to Taylors Creek was on the Georgia's 303(d) as of August 30, 1999 a TMDL will be developed.

## **Target Identification**

The target level for the development of the lead TMDL is the numeric criterion established in Georgia's Rules and Regulations for Water Quality Control, Chapter 391-3-6, Revised July 6, 1999. Georgia Regulations establish the freshwater criteria for lead expressed in terms of the dissolved fraction in the water column. Criteria were promulgated such that instream concentrations should not exceed the acute criterion indicated under 1-day, 10-year minimum flow (1Q10) or higher stream flow conditions and should not exceed the chronic criterion under 7-day, 10-year minimum flow (7Q10) conditions. The numeric criterion for lead in freshwater, assuming a hardness of 49 mg/l, is 1.15 ug/l.

The target level for the development of the copper TMDL is the numeric criterion established in Georgia's Rules and Regulations for Water Quality Control, Chapter 391-3-6, Revised July 6, 1999. Georgia Regulations establish the freshwater criteria for copper expressed in terms of the dissolved fraction in the water column. Criteria were promulgated such that instream concentrations should not exceed the acute criterion indicated under 1-day, 10-year minimum flow (1Q10) or higher stream flow conditions and should not exceed the chronic criterion under 7-day, 10-year minimum flow (7Q10) conditions. The numeric criterion for copper in freshwater, assuming a hardness of less than 49 mg/l, is 6.2 ug/l.

The target level for the development of the mercury TMDL is the numeric criterion established in Georgia's Rules and Regulations for Water Quality Control, Chapter 391-3-6, Revised July 6, 1999. Georgia

Regulations establish the freshwater criteria for mercury expressed in terms of the total recoverable in the water column. Criteria were promulgated such that instream concentrations should not exceed the acute criterion indicated under 1-day, 10-year minimum flow (1Q10) or higher stream flow conditions and should not exceed the chronic criterion under 7-day, 10-year minimum flow (7Q10) conditions. The numeric criterion for mercury in freshwater, assuming a hardness of less than 100 mg/l, is 0.012 ug/l.

## **Background**

The segment that was presumed to be impaired for copper, mercury and lead is located directly downstream of the Hinesville/Fort Stewart Wastewater Treatment Plant (WWTP). The segment listed is a 4-mile section from the confluence of Taylors and Canoochee Creek to the wastewater treatment plant outfall. The TMDL will address this segment.

## **Numeric Targets and Sources - Model Development**

The steady-state model provides predictions for only a single set of environmental conditions. For permitting purposes, steady-state models are applied for "critical" environmental conditions that represent extremely low assimilative capacity. For discharges to riverine systems, critical environmental conditions correspond to drought upstream flows. The assumption behind steady-state modeling is permit limits that protect water quality during critical conditions will be protective for the large majority of environmental conditions that occur.

## **Critical Condition Determination**

The most critical condition for this segment of the Taylors Creek will be used to determine the TMDL. Lead, copper and mercury will be considered conservative substances in the TMDL calculation. The influence on the instream lead, copper and mercury concentration will be river flow. For the Taylors Creek segment, the critical flow will be considered 0.41 cubic meters per second (cms). This flow represents the 7Q10 flow plus the Hinesville/Fort Stewart WWTP monthly average flow (0.29 cms).

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## **Total Maximum Daily Load (TMDL)**

The TMDL is the total amount of pollutant that can be assimilated by the receiving water body while achieving water quality standards. Since there are no known permitted point sources of lead, copper or mercury and the recent data indicates the water is not impaired for lead, copper, and mercury, this TMDL will be expressed as a loading capacity. If in the future, a point or nonpoint source load of lead, copper and mercury is introduced in the system the total of the WLA (wasteload allocations for point source loadings) and LA (load allocation for nonpoint source loadings) shall not exceed this loading capacity.

### ***Margin of Safety***

The margin of safety (MOS) is part of the TMDL development process. There are two basic methods for incorporating the MOS (USEPA, 1991a):

- Implicitly incorporating the MOS using conservative model assumptions to develop allocations, or
- Explicitly specifying a portion of the total TMDL as the MOS; using the remainder for allocations.

The MOS is incorporated implicitly into this modeling process by selecting the critical low flow.

### ***TMDL Calculation***

The TMDL calculation will utilize the conservation of mass principle, where the load can be calculated by using the following relationship:

$$\text{Concentration} = \text{Load} / \text{Flow (Taylors Creek + WWTP)}$$

Rearranging this equation the maximum load can be calculated as follows:

$$\text{Load} = \text{Concentration (Water Quality Standard)} * \text{Flow (Taylors Creek + WWTP)}$$

The Total Maximum Daily load for the Taylors Creek for Lead, Copper and Mercury is given in Table 1.

Since a TMDL is the sum of wasteload allocations (WLA) plus load allocation (LA) and a margin of safety (MOS), the TMDL can be represented as:

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$$\text{TMDL} = \text{WLA} + \text{LA} + \text{MOS}$$

**Table 1 TMDL Calculation**

<b>Pollutant</b>	<b>TMDL (kg/day)</b>	<b>WLA (kg/day)</b>	<b>LA (kg/day)</b>	<b>MOS</b>
Lead	0.04	0.04	0	Implicit
Copper	0.219	0.219	0	Implicit
Mercury	0.0004	0.0004	0	Implicit

### ***Seasonal Variation***

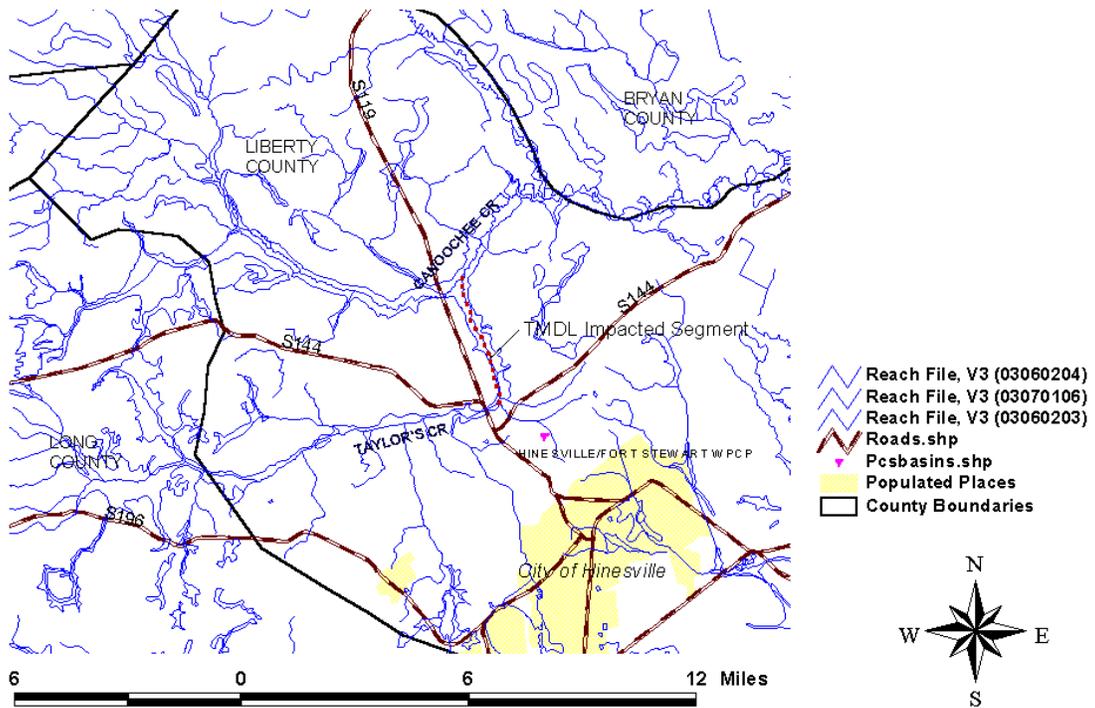
The low flow condition represents the most critical design condition and will provide year round protection.

### ***Allocation of Responsibility and Recommendations***

The allocation of lead, copper and mercury load to Taylors Creek is given in Table 1. Since impairment in this segment by lead, mercury and copper has been ruled out by recent sampling data, the TMDL does not assign responsibility for load reductions. This TMDL does establish an effluent limit for mercury, lead and zinc for the Hinesville/Fort Stewart WWTP as prescribed in Table 1.

## Appendix A -- Site Map

# Taylors Creek TMDL Location Map



## Appendix B – Units Conversion Table

<b>From</b>	<b>To</b>	<b>Multiply by:</b>
Million Gallons per Day (MGD)	Cubic Meters per Second (cms)	0.04381
Cubic Feet per Second (cfs)	Cubic Meters per Second (cms)	0.02832
Pounds (lbs)	Kilograms (Kg)	0.4536
Tons (Short)	Kilograms (Kg)	907.1848
Tons (Long)	Kilograms (Kg)	1016.00

# Appendix C – Georgia EPD Data

*Trib. to Taylors Creek Estuary*

**GEORGIA DEPARTMENT OF NATURAL RESOURCES  
ENVIRONMENTAL PROTECTION DIVISION**  
455 14th Street NW, Atlanta, GA 30318-7900  
(404) 206-5269

**LABORATORY REPORT**

TO: Georgia Env Protection Division Water Protection Branch		Date Collected: 5/24/99 Time Collected: 11:50 Sample Collector: SANFORD/MET Chlorination: Sample Type:	
Sample ID: ACS5612 Facility Name: TRIBUTARY TO TAYLOR'S CREEK Site ID: WQ Location ID: Location Descr: US HWY 144		Received By: MW Date Received: 5/25/99 Time Received: 12:32 PM Project: WQ Reporting Date: 5/5/99	

ANALYTE	PARAMETER CODE	NOTE	EPA METHOD	RESULT	UNITS	PQL	ANALYST	DATE	MCL or CC Range
Hardness	00900		EPA 130.2	60	mg/L	1	DRH	5/25/99	
<b>Water Quality Metals by ICPMS</b>									
Chromium	01034		EPA 200.8	33	ug/L	5	AAR	7/25/99	
Nickel	01067		EPA 200.8	Not Detected	ug/L	10	AAR	7/25/99	
Copper	01042		EPA 200.8	11	ug/L	5	AAR	7/25/99	
Zinc	01062		EPA 200.8	17	ug/L	10	AAR	7/25/99	
Arsenic	01052		EPA 200.8	Not Detected	ug/L	5	AAR	7/25/99	
Selenium	01147		EPA 200.8	Not Detected	ug/L	5	AAR	7/25/99	
Molybdenum	01062		EPA 200.8	Not Detected	ug/L	5	AAR	7/25/99	
Silver	01077		EPA 200.8	Not Detected	ug/L	5	AAR	7/25/99	
Calcium	01027		EPA 200.8	Not Detected	ug/L	0.7	AAR	7/25/99	
Antimony	01067		EPA 200.8	Not Detected	ug/L	5	AAR	7/25/99	
Barium	01007		EPA 200.8	13	ug/L	2	AAR	7/25/99	
Thallium	01059		EPA 200.8	Not Detected	ug/L	1	AAR	7/25/99	
Lead	01051		EPA 200.8	Not Detected	ug/L	1	AAR	7/25/99	
Tin	01102		EPA 200.8	Not Detected	ug/L	30	AAR	7/25/99	
Mercury	71900		EPA 245.1	Not Detected	ug/L	0.2	CN	7/7/99	

ug/L: micrograms/liter mg/L: milligrams/liter mg/kg: milligrams/kilogram ug/kg: micrograms/kilogram ug/g: micrograms/gram (ppt: parts per million)	<= less than MCL: Maximum Contaminant Level PQL: Practical Quantitation Limit LSPC: result less than lower specification USPQ: result greater than upper specification TIE: Tentatively Identified or Estimated VIOL: Violation (result exceeds MCL)	<b>Laboratory Contacts:</b> Inorganics: Pat Simmons Ext 5239 Metals: Mark Tolbert Ext 5240 Organics: Danny Reed Ext 5252 GC Mass Spec: Steve Bryan Ext 5260
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Sample ID: ACS5612 Page 1

**GEORGIA DEPARTMENT OF NATURAL RESOURCES  
ENVIRONMENTAL PROTECTION DIVISION**  
455 14th Street NW, Atlanta, GA 30318-7900  
(404) 206-5269

**LABORATORY REPORT**

TO: Georgia Env Protection Divison Water Protection Branch		Date Collected: 2/24/99 Time Collected: 13:45 Sample Collector: SANFORD/MET Chlorination: Sample Type:
Sample ID: AC44103 Facility Name: TRIB TO TAYLOR'S CRK @ HWY 144 Site ID: WQ Location ID: Location Descr: TMDL PROJECT		Received By: RLP Date Received: 2/25/99 Time Received: 11:14 AM Project: WQ Reporting Date: 5/5/99

ANALYTE	PARAMETER CODE	NOTE	EPA METHOD	RESULT	UNITS	PQL	ANALYST	ANALYSIS DATE	MCL
<b>Water Quality Metals by ICPMS</b>									
Chromium	01034		EPA 200.8	32	ug/L	5	AAR	4/1/99	
Nickel	01067		EPA 200.8	Not detected	ug/L	10	AAR	4/1/99	
Copper	01042		EPA 200.8	Not detected	ug/L	5	AAR	4/1/99	
Zinc	01062		EPA 200.8	84	ug/L	10	AAR	4/1/99	
Arsenic	01002		EPA 200.8	Not detected	ug/L	5	AAR	4/1/99	
Selenium	01147		EPA 200.8	Not detected	ug/L	5	AAR	4/1/99	
Molybdenum	01062		EPA 200.8	Not detected	ug/L	5	AAR	4/1/99	
Silver	01077		EPA 200.8	Not detected	ug/L	5	AAR	4/1/99	
Cadmium	01027		EPA 200.8	Not detected	ug/L	0.7	AAR	4/1/99	
Antimony	01097		EPA 200.8	Not detected	ug/L	5	AAR	4/1/99	
Barium	01007		EPA 200.8	34	ug/L	2	AAR	4/1/99	
Thallium	01099		EPA 200.8	Not detected	ug/L	1	AAR	4/1/99	
Lead	01091		EPA 200.8	3.8	ug/L	1	AAR	4/1/99	
Tin	01102		EPA 200.8	Not detected	ug/L	30	AAR	4/1/99	
<b>ICP Metals</b>									
Aluminum	01105		EPA 200.7	Not Detected	ug/L	50	PT	4/19/99	
Beryllium	01012		EPA 200.7	Not Detected	ug/L	10	PT	4/19/99	
Calcium	00918		EPA 200.7	9300	ug/L	1000	PT	4/19/99	
Cobalt	01037		EPA 200.7	Not Detected	ug/L	10	PT	4/19/99	
Iron	01045		EPA 200.7	180	ug/L	20	PT	4/19/99	
Potassium	00937		EPA 200.7	Not Detected	ug/L	5000	PT	4/19/99	
Magnesium	00927		EPA 200.7	1800	ug/L	1000	PT	4/19/99	
Manganese	01055		EPA 200.7	Not Detected	ug/L	10	PT	4/19/99	
Sodium	00829		EPA 200.7	6900	ug/L	1000	PT	4/19/99	
Titanium	01192		EPA 200.7	Not Detected	ug/L	10	PT	4/19/99	
Vanadium	01087		EPA 200.7	Not Detected	ug/L	10	PT	4/19/99	

ug/L: micrograms/liter  
mg/L: milligrams/liter  
mg/kg: milligrams/kilogram  
ug/kg: micrograms/kilogram  
ug/g: micrograms/gram  
ppm: parts per million

<: less than  
MCL: Maximum Contaminant Level  
PQL: Method Detection Limit  
LSPC: result less than lower specification  
USPC: result greater than upper specification  
TIE: Tentatively Identified or Estimated

**Laboratory Contacts:**

Inorganics: Pat Sammons Ext 5239  
Metals: Mark Torbert Ext 5240  
Organics: Danny Reed Ext 5252  
GC Mass Spec: Steve Bryan Ext 5200

## **Administrative Record Index**

1. City of Hinesville-Fort Stewart Regional Water Pollution Control Plant, NPDES Permit No. GA0047180
2. Compilation of Georgia's Current Modeling Guidelines for the Development of Wasteload Allocations and NPDES Permit Limitations. January 1991
3. Rules and Regulations for Water Quality Control, Chapter 391-3-6-.03, Water Use Classifications and Water Quality Standards
4. STORET Water Quality Data
5. Georgia Environmental Protection Division Stream Monitoring Data
6. On Disk: WASP Input Datasets
7. On Disk: Excel Spreadsheet to calculate TMDL

## **Response to Public Comment on Proposed TMDL**

### ***COMMENT***

The TMDL establishes an effluent limit for mercury, lead, and zinc for the Hinesville/Fort Stewart sewage treatment plant and it is expected that these limits will be imposed if there is any discharge of these pollutants by that plant.

Mr. Eric E. Huber, EarthJustice Legal Defense Fund, 400 Magazine Street, Suite 401, New Orleans, Louisiana 70130-2453, December 7, 1999

### ***RESPONSE***

The TMDL does establish an effluent limit for mercury, lead and zinc for the Hinesville/Ft. Stewart facility. This limit will be added at the next renewal cycle for the facility.

### ***COMMENT***

Commenter questions the sufficiency of assigning mercury and lead into the permit for the Hinesville/Fort Stewart sewage treatment plant while ignoring copper. There is no apparent investigation of point sources and no implementation of this TMDL.

Mr. Eric E. Huber, EarthJustice Legal Defense Fund, 400 Magazine Street, Suite 401, New Orleans, Louisiana 70130-2453, December 7, 1999

### ***RESPONSE***

A copper limit has been established for the Hinesville/Ft. Stewart facility.

### ***COMMENT***

The issue of acute vs. chronic criteria needs to be better explained in the statement of the criterion and TMDL.

Mr. Douglas P. Haines, Executive Director, Georgia Legal Watch, 264 North Jackson Street, Athens, Georgia 30601, December 22, 1999

***RESPONSE***

This TMDL has been developed under critical low flow condition to protect the chronic water quality standard. It is EPA's opinion that this protects all conditions.

***COMMENT***

Factors, including possible relocation of the outfall, additional discharges, and the fact that the receiving water may actually be a tributary to Taylors Creek (with less capacity), may be of significance and these are not addressed in EPA's TMDL documents.

Mr. Douglas P. Haines, Executive Director, Georgia Legal Watch, 264 North Jackson Street, Athens, Georgia 30601, December 22, 1999

***RESPONSE***

It is EPA's understanding that this outfall has not been relocated.

***COMMENT***

The discharge permit is described as not containing limits for the pollutants being addressed. This needs to be explained and perhaps changed. It is also stated that recent data shows no problems, but the referenced Appendix A with the data is not included.

Mr. Douglas P. Haines, Executive Director, Georgia Legal Watch, 264 North Jackson Street, Athens, Georgia 30601, December 22, 1999

***RESPONSE***

The recent data that has been collected by GAEPD has been added to the final TMDL. The TMDL does establish an effluent limit for mercury, lead and zinc for the Hinesville/Ft. Stewart facility. This limit will be added at the next renewal cycle for the facility.

***COMMENT***

It is not clear if the given criteria are acute or chronic.

Mr. Douglas P. Haines, Executive Director, Georgia Legal Watch, 264 North Jackson Street, Athens, Georgia 30601, December 22, 1999

***RESPONSE***

The TMDL has been modified to clearly explain what criteria were used to develop the effluent limits for the Hinesville/Ft. Stewart facility.

***COMMENT***

The given low flow of Taylors Creek does not seem to account for the point of discharge if it is to the tributary with a presumed lower flow. This does not match the flows used in the DO TMDL for the stream or the discharger.

Mr. Douglas P. Haines, Executive Director, Georgia Legal Watch, 264 North Jackson Street, Athens, Georgia 30601, December 22, 1999

***RESPONSE***

The critical low flow used to calculate this TMDL is the same flow of 0.41 cubic meters second that was used in the dissolved oxygen TMDL.

***COMMENT***

On page 5 in the Allocation of Responsibility and Recommendations section of the TMDL, it is stated that the TMDL established effluent limits for the discharge for three parameters. It is unclear if this means that these pollutants are present in the effluent or are likely to be, and if/when the permit is to be modified. No data on the effluent is provided.

Mr. Douglas P. Haines, Executive Director, Georgia Legal Watch, 264 North Jackson Street, Athens, Georgia 30601, December 22, 1999

***RESPONSE***

No current data is available for the plant's effluent. This segment was placed on Georgia's 303(d) list because of single sample taken in the late 1980's.

**COMMENT**

It is unclear if the hardness used to calculate the chronic concentrations is representative of the receiving waters during low flow conditions.

Mr. Michael E. Wilder, Water Resources Workgroup Chair, and Mr. James R. Baker, Chair, Georgia Industry Environmental Coalition, 112 Town Park Drive, Kennesaw, Georgia 30144, December 14, 1999

**RESPONSE**

There is not enough data to develop a relationship between flow and hardness.

**COMMENT**

The TMDL was calculated using a chronic instream concentration of 1.02 ug/l instead of 1.2 ug/l.

Mr. Michael E. Wilder, Water Resources Workgroup Chair, and Mr. James R. Baker, Chair, Georgia Industry Environmental Coalition, 112 Town Park Drive, Kennesaw, Georgia 30144, December 14, 1999

**RESPONSE**

The TMDL was been modified to explain what hardness value was used to calculate the target standard.

**COMMENT**

The TMDL should be revised to include discussions of nonpoint sources of mercury. Of particular interest are atmospheric and runoff loads of mercury.

Ms. Ruth Swanek, Supervisor, Modeling/TMDL Unit, North Carolina Division of Water Quality, 1617 Mail Service Center, Raleigh, North Carolina 27699-1617, December 15, 1999

***RESPONSE***

This segment of Taylors Creek was listed for a single mercury sample taken in the 1980's. GAEPD has since taken new samples for this segment and mercury was not detected. This TMDL was developed to evaluate the potential of NPDES facilities as defined in the Georgia TMDL lawsuit Consent Decree for causing impairment. Because recent data indicate mercury is no longer a problem in this segment, the TMDL calculates a maximum load for this segment and defines an effluent limit to be consistent with this calculation.

***COMMENT***

The TMDL should include a discussion of mercury cycling in the environment (include losses of mercury through volatilization of elemental mercury, advective and depositional losses of ionic mercury, and uptake/transport through biotic processing of methylmercury). It would benefit the reader to have an explanation of the factors involved in the speciation and compartmentalization of mercury in the watershed.

Ms. Ruth Swanek, Supervisor, Modeling/TMDL Unit, North Carolina Division of Water Quality, 1617 Mail Service Center, Raleigh, North Carolina 27699-1617, December 15, 1999

***RESPONSE***

EPA is aware of the complexity of mercury cycling in the environment. This TMDL was developed to evaluate the potential of NPDES facilities as defined in the Georgia TMDL lawsuit Consent Decree for causing the impairment.

***COMMENT***

An analysis of fish tissue levels should be presented in the TMDL, if such data are available. If data are not available, the TMDL should state this.

Ms. Ruth Swanek, Supervisor, Modeling/TMDL Unit, North Carolina Division of Water Quality, 1617 Mail Service Center, Raleigh, North Carolina 27699-1617, December 15, 1999

***RESPONSE***

This segment was listed for violating the Georgia mercury standard. No fish tissue data is available for this segment and the segment was not listed for fish consumption.

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**COMMENT**

Loads associated with the specified point source should be calculated and incorporated into the proposed TMDL. Additionally, upstream point and nonpoint sources of mercury should be included in the proposed TMDL and incorporated into the analysis.

Ms. Ruth Swanek, Supervisor, Modeling/TMDL Unit, North Carolina Division of Water Quality, 1617 Mail Service Center, Raleigh, North Carolina 27699-1617, December 15, 1999

**RESPONSE**

There are no other point source dischargers in the area. Nonpoint sources were not evaluated in this TMDL development.

**COMMENT**

The allocation of the allowable load should include nonpoint source loads (atmospheric deposition is known to occur).

Ms. Ruth Swanek, Supervisor, Modeling/TMDL Unit, North Carolina Division of Water Quality, 1617 Mail Service Center, Raleigh, North Carolina 27699-1617, December 15, 1999

**RESPONSE**

Nonpoint sources were not evaluated in this TMDL development.

**COMMENT**

A margin of safety and seasonal variation should specifically be addressed. It is unclear as to how a margin of safety number was derived and included in the TMDL calculation. There is no presentation of potential seasonal variations in any part of the TMDL.

Ms. Ruth Swanek, Supervisor, Modeling/TMDL Unit, North Carolina Division of Water Quality, 1617 Mail Service Center, Raleigh, North Carolina 27699-1617, December 15, 1999

***RESPONSE***

The margin of safety was the use of critical low flow that defines the lowest assimilative capacity that this water segment would have.

***COMMENT***

EPA should withdraw the proposed mercury TMDL for Taylors Creek until a scientifically valid TMDL can be developed.

Mr. M. E. Wilder, Environmental Manager, Land & Water Programs, Georgia Power Company, 241 Ralph McGill Boulevard NE, Atlanta, Georgia 30308-3374, December 15, 1999

***RESPONSE***

Comment noted.

***COMMENT***

The proposed mercury TMDL for Taylors Creek appears to be based only on the water quality criterion and the 7Q10 flow, and treats mercury as a conservative substance. It recognizes none of the environmental processes that lead to sequestering or loss of mercury from the aquatic system. EPA needs to give credit to the discharger in the analysis by accounting for fate and transport loss mechanisms and assuming that all the mercury potentially discharged appears in the system as dissolved mercury. The commenter suggests that some estimates of sediment partitioning and loss through volatilization could be made which would more realistically portray the dissolved concentration of mercury in this system and form the basis of a much more appropriate TMDL.

Mr. M. E. Wilder, Environmental Manager, Land & Water Programs, Georgia Power Company, 241 Ralph McGill Boulevard NE, Atlanta, Georgia 30308-3374, December 15, 1999

***RESPONSE***

EPA is fully aware of complexity of mercury cycling in the environment. This TMDL was developed to evaluate the potential of NPDES facilities as defined in the Georgia TMDL lawsuit Consent Decree for causing the impairment. This TMDL was developed to look at mercury contributions for the facility effluent. Because of the uncertainty of mercury data in this segment, it would be suggested that additional data be collected to determine potential sources of mercury.

***COMMENT***

The proposed mercury TMDL for Taylors Creek does not recognize the important effects of the complexation of mercury with dissolved organic carbon (DOC). EPA has not taken into account the fact that most of the mercury in the water column not bound to suspended solids will be bound to dissolved oxygen matter. The commenter believes that it is likely that Taylors Creek and waters downstream contain high concentration of DOC typical of the blackwater streams of much of South Georgia. The function of DOC in influencing the fate and transport of mercury needs to be considered. The commenter suggests that by discounting the effects of DOC on the fate and transport of mercury in Taylors Creek, EPA has specified a condition for mercury discharge that may be unachievable by the point source discharger. The commenter strongly recommends that EPA withdraw this TMDL until such time that measurement can be made of DOC and methylmercury in the system and a realistic TMDL can be established.

Mr. M. E. Wilder, Environmental Manager, Land & Water Programs, Georgia Power Company, 241 Ralph McGill Boulevard NE, Atlanta, Georgia 30308-3374, December 15, 1999

***RESPONSE***

EPA is fully aware of complexity of mercury cycling in the environment. This TMDL was developed to evaluate the potential of NPDES facilities as defined in the Georgia TMDL lawsuit Consent Decree for causing the impairment. This TMDL was developed to look at mercury contributions for the facility effluent. Because of the uncertainty of mercury data in this segment, it would be suggested that additional data be collected to determine potential sources of mercury.

***COMMENT***

The proposed mercury TMDL for Taylors Creek does not mention the possibility of background sources of mercury within the watershed. A seasonal analysis has not been performed, as required by EPA guidance.

Mr. M. E. Wilder, Environmental Manager, Land & Water Programs, Georgia Power Company,  
241 Ralph McGill Boulevard NE, Atlanta, Georgia 30308-3374, December 15, 1999

***RESPONSE***

Nonpoint sources were not evaluated in this TMDL development.

***COMMENT***

Georgia's current water quality standard for mercury is based upon a study of the effects of methylmercury on fathead minnows. Thus, the proportion of methylmercury to total recoverable mercury in a sample is an important issue. If not all the mercury in the water column is methylmercury, the proportion of methylmercury should be estimated in order to perform an analysis with a more realistic margin of safety.

Mr. M. E. Wilder, Environmental Manager, Land & Water Programs, Georgia Power Company,  
241 Ralph McGill Boulevard NE, Atlanta, Georgia 30308-3374, December 15, 1999

***RESPONSE***

Nonpoint sources were not evaluated in this TMDL development.

***COMMENT***

EPA assumes that the Hinesville/Fort Stewart WWTP is the only source of mercury to Taylors Creek and places the burden of load reduction completely and unjustifiably on the shoulders of the point source discharge. There is ample evidence of other nonpoint sources of mercury in this region, including mineral mercury accumulated in wetlands. It is quite probable that deposition of particulate-bound mercury from nonpoint sources following runoff events could be a major contributor of mercury in this creek, and that concentrations in the water column could be the consequence of ongoing mercury cycling in the water body following such events.

Mr. M. E. Wilder, Environmental Manager, Land & Water Programs, Georgia Power Company,  
241 Ralph McGill Boulevard NE, Atlanta, Georgia 30308-3374, December 15, 1999

***RESPONSE***

Comment noted.

***COMMENT***

Please contact the commenter to let him know how EPA responds to his comments, and how EPA intends to modify the TMDLs as a consequence of his comments.

Mr. Douglas P. Haines, Executive Director, Georgia Legal Watch, 264 North Jackson Street, Athens, Georgia 30601, December 22, 1999

***RESPONSE***

The TMDL responsiveness summary will be sent to commenters.

***COMMENT***

Taylors Creek should be delisted from the ' 303(d) list as it has been shown not to be impaired for mercury. The fact that Taylors Creek appeared on Georgia's 1998 ' 303(d) list should not form the basis for a TMDL to be done, if in fact the listing was in error.

Mr. M. E. Wilder, Environmental Manager, Land & Water Programs, Georgia Power Company, 241 Ralph McGill Boulevard NE, Atlanta, Georgia 30308-3374, December 15, 1999

***RESPONSE***

Comment noted.

## **References:**

Better Assessment Science Integrating Point and Nonpoint Sources, BASINS, Version 2, User's Manual. EPA-823-B-98-006

Rules and Regulations for Water Quality Control, Chapter 391-3-6-.03, Water Use Classifications and Water Quality Standards

Sierra Club v. EPA & Hankinson USDC-ND-GA Atlanta Div. #1: 94-CV-2501-MHS

USEPA. Guidance for Water Quality-based Decisions: The TMDL Process. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA/440/4-91-001, April 1991.