TOTAL MAXIMUM DAILY LOAD (TMDL) DEVELOPMENT

For Copper in Rocky Creek

Wilkes County, Georgia

Savannah River Basin
(HUC 03060102)

June 21, 2001

Total Maximum Daily Load (TMDL) Summary

The U.S. Environmental Protection Agency is hereby establishing a TMDL for copper for the protection of aquatic life in the Rocky Creek watershed. The State of Georgia's 1998 Section 303(d) list identified Rocky Creek, downstream of the Washington Water Pollution Control Plant (WPCP), in the Savannah River basin as not supporting its designated use for the parameters copper and toxicity. The State of Georgia indicated in its 2000 Section 303(d) list that Rocky Creek was no longer impaired from copper and toxicity and EPA approved that determination. The United States District Court for the Northern District of Georgia, Atlanta Division on March 23, 2001 ordered the United States Environmental Protection Agency (EPA) to establish TMDLs for copper and toxicity for Rocky Creek by June 21, 2001.

EPA proposed copper and toxicity TMDLs for Rocky Creek on April 19, 2001 for public review and comment. Based on comments that were received, minor changes to the TMDL report were made including the addition of a map of Rocky Creek and a correction concerning a reference to the U.S. District Court for the Northern District of Georgia, Atlanta Division. In addition, although low-flow critical conditions are used to develop this TMDL, EPA has determined that it is unnecessary to include this as part of the margin of safety (MOS) for this TMDL. The margin of safety section of the report has been modified to reflect this. Furthermore, this final TMDL report includes a clarification of the time averaging periods for which the allocations apply. Specifically, consistent with Georgia's water quality standards, the TMDL to protect the chronic copper water quality target is established as a 96-hour average allocation and the TMDL to protect the acute copper water quality target is established as a 1-hour average allocation. Therefore, the copper TMDL for Rocky Creek can be summarized as follows:

ROCKY CREEK COPPER TMDL SUMMARY

Parameter	Criterion Protected	Wasteload Allocation	Load Allocation	MOS	TMDL
Total recoverable copper	Site-specific Adjusted Chronic	0.3767 kg/day 24.88 ug/l (as a 96-hour average)	0.0 kg/day	Implicit	0.3767 kg/day (as a 96-hr avg)
Total recoverable copper	Site-specific Adjusted Acute	0.5223 kg/day 34.50 ug/l (as a 1-hour average)	0.0 kg/day	Implicit	0.5223 kg/day (as a 1-hr avg)

Original signed by
Beverly H. Banister, Director
Water Management Division

June 21, 2001
Date

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Introduction

A copper Total Maximum Daily Load (TMDL) and a toxicity TMDL for Rocky Creek were proposed by the United States Environmental Protection Agency (EPA) for public review and comment on January 5, 2000. The EPA held a public meeting in Washington, Georgia on February 15, 2000 to present information and hear comments on the proposed Rocky Creek TMDLs. Based on information that became available during the months that followed the public notice of the Rocky Creek TMDLs, the Environmental Protection Division of the Georgia Department of Natural Resources (GAEPD), with EPA's support, determined that Rocky Creek was no longer impaired from copper and toxicity and thus removed these parameters from its §303(d) list (i.e., impaired waters list). At that time, GAEPD also determined that Rocky Creek was biologically impaired and listed Rocky Creek for "Biota". On May 5, 2000, EPA informed all Rocky Creek TMDL commenters and public hearing attendees that EPA's approval of GAEPD's §303(d) list would result in the withdrawal of the Rocky Creek TMDLs. EPA approved GAEPD's §303(d) list on August 28, 2000.

On March 23, 2001, based on the plaintiff's motion for action under the October 1997 Consent Decree between the Sierra Club, et al., and the EPA, the United States District Court for the Northern District of Georgia, Atlanta Division ordered the EPA to establish TMDLs for copper and toxicity for Rocky Creek by June 21, 2001. EPA determined that the TMDLs should be re-proposed for public review and comment before they are finalized. This determination was made considering that significant changes to the copper TMDL were necessary based on a change in the appropriate copper water quality target for Rocky Creek. In order to provide the public an opportunity to review and comment on the copper TMDL and toxicity TMDL concurrently, both TMDLs were re-proposed on April 19, 2001.

Based on comments that were received from the public on the re-proposed TMDLs, minor changes to the TMDL report were made including the addition of a map of Rocky Creek and a correction concerning a reference to the U.S. District Court for the Northern District of Georgia, Atlanta Division. In addition, although low-flow critical conditions are used to develop this TMDL, EPA has determined that it is unnecessary to include this as part of the margin of safety for this TMDL. Specifically, the use of a low value for hardness is sufficient for this TMDL's implicit margin of safety. Furthermore, this final TMDL report includes a clarification of the time averaging periods for which the allocations apply. Specifically, consistent with Georgia's water quality standards, the TMDL to protect the chronic copper water quality target

is established as a 96-hour average allocation and the TMDL to protect the acute copper water quality target is established as a 1-hour average allocation.

The GAEPD assesses its water bodies for compliance with water quality standards criteria established for their designated uses as required by the Federal Clean Water Act (CWA). Assessed water bodies are placed into three categories; fully supporting, partially supporting, or not supporting their designated uses depending on water quality assessment results. These water bodies are found in GAEPD's 305(b) report as required by that section of the CWA that defines the assessment process, and are published in *Water Quality in Georgia* every two years.

Some of the waters in GAEPD's 305(b) report that have been identified as partially supporting or not supporting their designated uses are assigned to GAEPD's §303(d) list. These water bodies are considered to be water quality limited and cannot meet their designated use standards. Water bodies on the §303(d) list are required to have a TMDL established for each water quality parameter where designated uses are not being fully attained. The TMDL process establishes the allowable loading of pollutants or other quantifiable parameters for a water body based on the relationship between pollution sources and instream water quality conditions.

EPA is establishing this TMDL under CWA section 303(d)(2) pursuant to an order issued in the case Sierra Club v. EPA, 1:94-CV-2501-MHS (N.D. Ga.). In the absence of that court order, EPA would not issue this TMDL. Rocky Creek is not on the current CWA section 303(d) list for copper, nor is it impaired for copper. As described in the Problem Definition and Target Identification sections of this report, EPA and GAEPD determined that Rocky Creek is currently fully supporting its designated uses for copper based on an assessment of the available copper data with respect to a site-specific criteria adjustment. Georgia submitted its 2000 list to EPA for approval on April 28, 2000, and EPA approved it on August 28, 2000. Georgia has no current obligation under the Clean Water Act to submit to EPA TMDLs for that water/pollutant combination, and EPA has neither the obligation nor the authority to establish such TMDLs in Georgia's place under CWA section 303(d)(2) in the absence of the current court order. In addition, EPA does not believe that Congress intended either the States or EPA to establish TMDLs pursuant to 303(d)(2) for pollutants that are not impairing a waterbody. TMDLs for waters that are meeting water quality standards, are to be developed pursuant to section 303(d)(3). However, Congress conferred authority to estimate such informational TMDLs exclusively upon the States and did not contemplate any role for

EPA. States are not required to submit (d)(3) TMDLs to EPA for review and EPA neither approves nor disapproves (d)(3) TMDLs. EPA has filed an appeal of the March 23, 2001, order in Sierra Club v. EPA, which directed EPA to establish this TMDL. If the March 23 order is vacated, EPA would withdraw the TMDL on the ground that EPA is not authorized to establish such TMDL under the authorities of section 303(d).

Problem Definition

Georgia's 1998 Section 303(d) list identified Rocky Creek, downstream of the Washington Water Pollution Control Plant (WPCP), as not supporting its designated use for fishing and propagation of fish, shellfish, game, and other aquatic life. Concentrations of copper in excess of the water quality standard and toxicity were identified as the criteria violated while the potential cause of impairment was identified as the municipal facility.

Based on an assessment in 2000 of the available copper data with respect to a site-specific criteria adjustment for the copper water quality standard for Rocky Creek, EPA and GAEPD determined that Rocky Creek was not impaired for the parameter copper. More information regarding the site-specific criteria adjustment is included in the Target Identification section of this report. Although Rocky Creek is currently fully supporting its designated uses for copper, the object of this report is to establish the copper TMDL for Rocky Creek.

Target Identification

Chapter 391-3-6-.03 of Georgia's Rules and Regulations for Water Quality Control requires that instream concentrations of dissolved copper shall not exceed the acute criterion indicated below under 1-day, 10-year minimum (1Q10) or higher stream flow conditions and shall not exceed the chronic criterion indicated in the Rule under 7-day, 10-year minimum (7Q10) or higher stream flow conditions. Georgia's Rules and Regulations defines the acute criteria as the highest concentration of a pollutant to which aquatic life can be exposed for a short period of time (1-hour average) without deleterious effects. It also defines the chronic criteria as the highest concentration of a pollutant to which the aquatic life can be exposed for an extended period of time (4 days) without deleterious effects.

Georgia Regulation 391-3-6-.03(5)(e)(ii) establishes the chronic criteria and acute criteria for dissolved copper as:

$$\text{chronic criteria for dissolved copper} = (e^{(0.8545[\ln(\text{hardness})] - 1.465)})(0.96)\ \mu g/l$$

$$\text{acute criteria for dissolved copper} = (e^{(0.9422[\ln(\text{hardness})] - 1.464)})(0.96)\ \mu g/l$$

where hardness is expressed as mg/l as $CaCO_3$.

EPA recognizes that its laboratory-derived water quality criteria, which is the basis for the copper criteria established by GAEPD, may not always accurately reflect site-specific conditions because of the effects of water chemistry and the ability of species to adapt over time. Therefore, federal regulations allow states to adopt procedures, subject to EPA's review and approval, for developing site-specific criteria adjustments. In Chapter 391-3-6-.06(4)(d)5(ii)(d) of Georgia regulations, the State provides NPDES permitted dischargers the option of developing a site-specific criteria adjustment using EPA's *Interim Guidance on Determination and Use of a Water-Effect Ratio for Metals* (Cookbook procedures) and the simplified Water Effect Ratio (WER) requirements. A WER is a measure of the toxicity of a material, such as copper, obtained in a site water, such as Rocky Creek, divided by the same measure of the toxicity of the same material obtained simultaneously in a laboratory dilution water.

Since 1991, the City of Washington has expressed interest to GAEPD and EPA in using a WER for Rocky Creek. In February 2000, EPA provided the City of Washington with a memorandum which proposed and outlined a simplified WER procedure which could be used by the City to develop a site-specific criteria adjustment for Rocky Creek. A consultant for the City of Washington conducted two WER studies which consisted of tests of the City of Washington's effluent for samples collected January 17-18, 2000 and March 5-6, 2000. EPA was provided copies of the first and second WER studies respectively on February 21, 2000 and March 29, 2000.

EPA's review of the City's WER studies concluded that: 1) the first test was invalid because of lab procedural irregularity; and 2) a site-specific criteria adjustment for Rocky Creek could be based on data from the second test. Based on data from the second test, EPA determined that a WER for Rocky Creek of 4.13 is applicable to the allowable instream total recoverable copper concentrations and can be used for a site-specific criteria adjustment. Specifically, the

existing dissolved criterion for Rocky Creek can be adjusted to reflect the following total recoverable criterion based on the WER:

$$\text{chronic criteria for total recoverable copper} = (e^{(0.8545[\ln(\text{hardness})] - 1.465)})(4.13)\ \mu g/l$$
$$\text{acute criteria for total recoverable copper} = (e^{(0.9422[\ln(\text{hardness})] - 1.464)})(4.13)\ \mu g/l$$

where hardness is expressed as mg/l as $CaCO_3$.

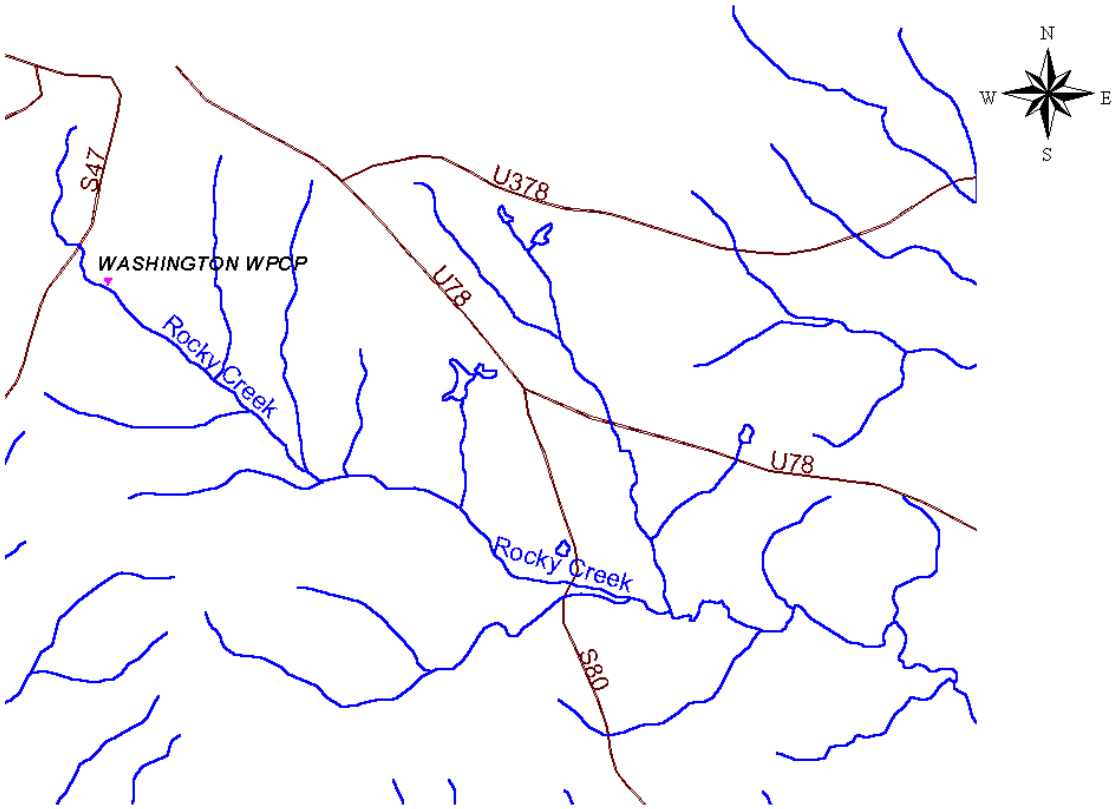
In an April 28, 2000 letter to GAEPD, EPA recommended applying the above site-specific criteria adjustment for copper to Rocky Creek. Based on this recommendation, GAEPD assessed copper water quality and effluent data in Rocky Creek with respect to the adjusted criteria and removed copper as a problem parameter from the State's §303(d) list. Therefore, GAEPD and EPA consider the adjusted criterion to be applicable for Rocky Creek.

Metals effluent permit limitations are required to be expressed as total recoverable metal per 40 CFR §122.45(c). Because the water quality target for Rocky Creek is in the total recoverable form, the TMDL will be expressed in terms of total recoverable copper. Therefore, the use of a metals translator is not applicable for the TMDL.

Background

Rocky Creek originates less than one mile from the center of Washington, Georgia. The creek originates in an urban setting but much of its watershed lies in rural areas amidst pasture lands and forested areas. Rocky Creek flows for approximately twelve miles through southern Wilkes County before it empties into Little River just upstream of Clarks Hill Reservoir and the City's main water intake. Rocky Creek is in the Little River Watershed which lies in the middle of the Savannah River Basin in eastern Georgia.

Figure 1. Rocky Creek Watershed



The Washington WPCP is the only point source discharger of wastewater in the Rocky Creek Watershed. It treats both municipal and industrial wastewater using an activated sludge system with a design capacity of 4.0 million gallons per day (MGD) discharge of treated wastewater. Between 1992 and 1994, the WPCP underwent modifications to reduce the environmental impact of its effluent to Rocky Creek, including the reduction of salts and surfactants in the effluent and dechlorination. In September 1995, a major source of chlorides, dyes, surfactants, and other chemicals was eliminated when Concord Fabrics, a large textile industry, was closed. The WPCP, however, continues to treat a significant amount of industrial flow from six local industries. The most significant of these contributors is the Standard Coosa Thatcher Corporation, a yarn dying facility, accounting for approximately 50-60 percent of the plant's flow. The five additional industries are Paper Pak, an adult diaper manufacturer; Clarke Schwebel, which produces computer boards and fiberglass; Edison Plastic, a manufacturer of backing for diapers; International Paper; and Anthony Forest Products.

Water quality data associated with the City's effluent is located in a spreadsheet within the appendix of this report. This spreadsheet also contains an assessment of this data with respect to the chronic and acute criteria, which were determined using the WER and available hardness data.

Rocky Creek is an effluent dominated stream with the point source contributing to an instream waste concentration (IWC) of 99.2 percent at critical 7Q10 low flow conditions and an IWC of 100 percent at critical 1Q10 low flow conditions. The Washington WPCP is the only point source discharger of wastewater in the Rocky Creek River Watershed. There are no known non-point source contributors of copper to Rocky Creek.

Linkage Between Numeric Targets and Sources

For TMDL purposes, steady-state models are applied for "critical" environmental conditions that represent extremely low assimilative capacity. For effluent-dominated riverine systems where there are no known sources of nonpoint source loading, critical environmental conditions correspond to drought upstream flows. The assumption behind steady-state modeling is that effluent concentrations that protect water quality during critical conditions will be protective for the large majority of environmental conditions that occur.

Critical Condition Determination

As documented in Georgia's 1998 §303(d) list, GAEPD indicated that the only potential cause of copper impairment to Rocky Creek was the effluent from the City of Washington WPCP. Since there is no known potential nonpoint source contribution of copper to Rocky Creek, the critical flow conditions for this TMDL are represented by scenarios where the ratio of effluent to stream flow is the greatest. For protection of the chronic criteria, this flow condition occurs when the Washington WPCP is discharging at its design capacity (i.e., 4.0 MGD) and the stream is flowing at 7Q10 conditions (i.e., 0.05 cubic feet per second or 0.032 MGD). For protection of the acute criteria, this flow condition occurs when the Washington WPCP is discharging at its design capacity and the stream is flowing at 1Q10 conditions (i.e., 0.0 cubic feet per second).

Based on the available effluent hardness data from the City of Washington WPCP, the measured hardness concentrations ranged from 45 to 80 mg/l as $CaCO_3$. Since this stream

is effluent-dominated during low flow critical conditions, the effluent hardness concentrations are assumed to be representative of the instream hardness concentrations. In order to be protective of the dissolved copper criteria for the entire anticipated range of instream hardness values, an assumed hardness of 45 mg/l as $CaCO_3$ was used for the development of the TMDL.

Total Maximum Daily Load (TMDL) Calculation

A TMDL is comprised of the sum of individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for both nonpoint sources and natural background levels in a given watershed. In addition, the TMDL must include a margin of safety (MOS), either implicitly or explicitly, that accounts for the uncertainty in the relation between pollutant loads and the quality of the receiving water body. The sum of these components must not exceed the water quality standard (WQS) for the pollutant of concern and for that watershed. Conceptually, this definition is denoted by the equation:

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

The TMDL is the total amount of pollutant that can be assimilated by the receiving water body while attaining water quality standards. Consistent with Chapter 391-3-6-.03 of Georgia's Rules and Regulations for Water Quality Control, the allocation established to protect the chronic copper criterion is expressed as a 96-hour average and the allocation established to protect the acute copper criterion is expressed as a 1-hour average.

Wasteload Allocation

For effluent dominated riverine systems where nonpoint sources are not causing or contributing to the impairment of the water, the WLA is determined by multiplying the instream criteria concentration by a "dilution factor." In accordance with Georgia's Regulation 391-1-6-.06(2)(f)(1), the dilution factor for constituents and their chronic criteria listed in 391-3-6-.03(5)(e)(ii)(5)(a) is equal to the following:

$$\frac{\text{7-day, 10-year minimum stream flow (7Q10) + discharger design flow}}{\text{discharger design flow}}$$

In accordance with Georgia's Regulation 391-1-6-.06(2)(f)(1), the dilution factor for constituents and their acute criteria listed in 391-3-6-.03(5)(e)(ii)(5)(a) is equal to the following:

$$\frac{\text{1-day, 10-year minimum stream flow (1Q10) + discharger design flow}}{\text{discharger design flow}}$$

For the listed segment of Rocky Creek, the dilution factors applied to the City of Washington WPCP are:

chronic criteria dilution factor :	(0.032 MGD + 4.0 MGD)/4.0 MGD	=	1.008
acute criteria dilution factor:	(0.0 MGD + 4.0 MGD)/4.0 MGD	=	1.00

For a water with a hardness of 45 mg/l (as $CaCO_3$), the adjusted site-specific total recoverable chronic water quality criterion is 24.68 µg/l and the adjusted site-specific total recoverable acute water quality criterion is 34.50 µg/l.

The allowable total recoverable chronic and acute effluent concentrations from the City of Washington WPCP are determined as follows:

allowable effluent chronic conc. = chronic criteria conc. x dilution factor x translation factor
= 24.68 µg/l x 1.008 x 1.0
= 24.88 µg/l (as a 96-hour average)

allowable effluent acute conc. = acute criteria conc. x dilution factor x translation factor
= 34.50 µg/l x 1.00 x 1.0
= 34.50 µg/l (as a 1-hour average)

Because the adjusted site-specific criterion are already in the total recoverable form, there is no need for a translation. Therefore, a translation factor of 1.0 was used in the above equations.

Allowable total recoverable loading to protect the site-specific adjusted copper chronic criterion:

allowable loading = allowable effluent chronic conc. x design flow x unit conversion factor
= 24.88 µg/l x $4.0*10^6$gallons/day x $3.785*10^{-9}$ L*kg/(µg*gallons)
= 0.3767 kg/day (or 0.8306 lbs/day) as a 96-hour average effluent load

Allowable total recoverable loading to protect the site-specific adjusted copper acute criterion:

allowable loading = allowable effluent acute conc. x design flow x unit conversion factor

= 34.50 µg/l x $4.0*10^{6}$ gallons/day x $3.785*10^{-9}$ L*kg/(µg*gallons)
= 0.5223 kg/day (or 1.152 lbs/day) as a 1-hour average effluent load

Load Allocation

As GAEPD documented in its 1998 §303(d) list, the only potential cause of copper impairment to Rocky Creek was the effluent from the City of Washington WPCP. Therefore, the existing copper loading to Rocky Creek from nonpoint sources is assumed to be 0.0 kg/day. Since the wasteload allocation uses all of the assimilative capacity of Rocky Creek during critical conditions, the allocation to the nonpoint sources (i.e., the load allocation) is set to equal the existing loading of 0.0 kg/day.

Margin of Safety

In accordance with section 303(d)(1)(c) of the CWA, the margin of safety (MOS) shall account for any lack of knowledge concerning the relationship between effluent limitations and water quality. There are two basic methods for incorporating the MOS:

1. Implicitly incorporating the MOS using conservative assumptions to develop allocations; or

2. Explicitly specifying a portion of the total TMDL as the MOS; using the remainder for allocations.

The MOS is incorporated implicitly into the TMDL process through the use of a low hardness value in the calculation of the applicable chronic and acute criteria for copper.

Seasonal Variations

The wasteload allocation and load allocation provide for year-round protection of the water quality standards for copper and therefore sufficiently account for seasonal variability.

TMDL SUMMARY

Parameter	Criterion Protected	WLA	LA	MOS	TMDL
Total recoverable copper	Site-specific Adjusted Chronic	0.3767 kg/day 24.88 ug/l (as a 96-hour average)	0.0 kg/day	Implicit	0.3767 kg/day (as a 96-hr avg)
Total recoverable copper	Site-specific Adjusted Acute	0.5223 kg/day 34.50 ug/l (as a 1-hour average)	0.0 kg/day	Implicit	0.5223 kg/day (as a 1-hr avg)

Allocation of Responsibility

This TMDL has been established to be protective of the site-specific adjusted copper criteria for Rocky Creek. As described in the Target Identification section of this report, EPA and GAEPD have determined that the site-specific adjusted copper criteria is applicable to Rocky Creek, because it is representative of the copper criteria necessary for Rocky Creek to meet its designated uses for fishing, propagation of fish, shellfish, game and other aquatic life. In accordance with Georgia's Regulation 391-1-6-.06(4)(d)(5)(ii)(d) and 391-1-6-.06(7), any permit modifications or re-issuances pursuant to the site-specific criterion adjustment will be conducted through a public participation process.

It is important to note that a wasteload allocation to an individual point source discharger does not automatically result in a permit limit or monitoring requirement. Through its NPDES permitting process, GAEPD will determine whether the City of Washington has a reasonable potential of discharging copper at levels equal to or greater than the allocated concentration and load. The results of this reasonable potential analysis will determine the specific type of requirements for the City of Washington's NPDES permit. As part of its analysis, the State's NPDES permitting group will use most current EPA-approved Reasonable Potential Procedures to determine whether monitoring requirements or effluent limitations are necessary. If effluent limitations or monitoring requirements are determined through a reasonable potential analysis to be necessary for the City of Washington, it is recommended that concentration limits or concentration monitoring requirements should be imposed in addition to any loading limits or monitoring requirements.

References

1. Environmental Protection Division of the Georgia Department of Natural Resources. NPDES Reasonable Potential Procedures. Atlanta, GA. January 1995.

2. Environmental Protection Division of the Georgia Department of Natural Resources. *Final version of the Georgia 1998 303(d) list.* Atlanta, GA. December 22, 1998.

3. Environmental Protection Division of the Georgia Department of Natural Resources. Rules and Regulations for Water Quality Control, Chapter 391-3-6. Atlanta, GA. April 2000.

4. Environmental Protection Division of the Georgia Department of Natural Resources. Letter with enclosures from Alan W. Hallum to Beverly Banister. April 28, 2000.

5. United States District Court, Northern District of Georgia, Atlanta Division. ORDER re: Civil Action 1:94-CV-2501-MHS, March 23, 2001.

6. USEPA. Total Maximum Daily Load (TMDL) Development for Copper in Rocky Creek. U.S. Environmental Protection Agency, Region 4, Water Management Division. Atlanta, GA. January 5, 2000.

7. USEPA. Total Maximum Daily Load (TMDL) Development for Toxicity in Rocky Creek. U.S. Environmental Protection Agency, Region 4, Water Management Division. Atlanta, GA. January 5, 2000.

8. USEPA. Letter from Robert F. McGhee to Alan W. Hallum of the Environmental Protection Division. U.S. Environmental Protection Agency, Region 4, Water Management Division. Atlanta, GA. April 28, 2000.

9. USEPA. Memorandum from Robert F. McGhee to Rocky Creek TMDL Public Hearing Attendees and Commenters regarding “Notice of 303(d) List Change which may affect proposed TMDLs for waters and pollutants of concern in the State of Georgia.” U.S. Environmental Protection Agency, Region 4, Water Management Division. Atlanta, GA. May 5, 2000.

10. USEPA. Letter from Beverly H. Banister to Alan W. Hallum of the GAEPD regarding the "Final 2000 § 303(d) List". U.S. Environmental Protection Agency, Region 4, Water Management Division. Atlanta, GA. August 28, 2000.

Appendix – Monitored Effluent Copper Data

effluent total hardness (mg/l as CaCO3)	date	source of data	effluent copper sample (ug/l)	estimated % effluent instream (fraction)	estimated instream conc (ug/l)	chronic criterion (ug/l)	excursion of chronic criterion (yes/no)	acute criterion (ug/l)	excursion of acute criterion (yes/no)
52	3/4-5/96	Aquatic Biomonitoring Chronic Testing - City of Washington Rocky Creek WPCP - March 1996, GA EPD	49	0.395	19.355	27.93	no	39.53	**yes**
51	3/6-7/96	Aquatic Biomonitoring Chronic Testing - City of Washington Rocky Creek WPCP - March 1996, GA EPD	59	0.30 (assumed)	17.7	27.47	no	38.82	**yes**
47	3/7-8/96	Aquatic Biomonitoring Chronic Testing - City of Washington Rocky Creek WPCP - March 1996, GA EPD	< 20	0.3175	6.35	25.62	no	35.94	no
76	12/1-2/96	Toxicity Identification Evaluation of the Washington, Georgia WWTP Effluent - 9/30/97, Integrated Laboratory Systems (for EPA)	20	1.0 (assumed)	20	38.62	no	56.53	no
67	12/3-4/96	Toxicity Identification Evaluation of the Washington, Georgia WWTP Effluent - 9/30/97, Integrated Laboratory Systems (for EPA)	20	1.0 (assumed)	20	34.68	no	50.20	no
68	12/5-6/96	Toxicity Identification Evaluation of the Washington, Georgia WWTP Effluent - 9/30/97, Integrated Laboratory Systems (for EPA)	10	1.0 (assumed)	10	35.12	no	50.90	no
77	12/8-9/96	Toxicity Identification Evaluation of the Washington, Georgia WWTP Effluent - 9/30/97, Integrated Laboratory Systems (for EPA)	10	1.0 (assumed)	10	39.06	no	57.23	no
77	12/10-11/96	Toxicity Identification Evaluation of the Washington, Georgia WWTP Effluent - 9/30/97, Integrated Laboratory Systems (for EPA)	16	1.0 (assumed)	16	39.06	no	57.23	no
69	12/12-13/96	Toxicity Identification Evaluation of the Washington, Georgia WWTP Effluent - 9/30/97, Integrated Laboratory Systems (for EPA)	16	1.0 (assumed)	16	35.56	no	51.61	no
79	12/15-16/96	Toxicity Identification Evaluation of the Washington, Georgia WWTP Effluent - 9/30/97, Integrated Laboratory Systems (for EPA)	11	1.0 (assumed)	11	39.92	no	58.63	no
80	12/17-18/96	Toxicity Identification Evaluation of the Washington, Georgia WWTP Effluent - 9/30/97, Integrated Laboratory Systems (for EPA)	15	1.0 (assumed)	15	40.36	no	59.32	no
71	12/19-20/96	Toxicity Identification Evaluation of the Washington, Georgia WWTP Effluent - 9/30/97, Integrated Laboratory Systems (for EPA)	14	1.0 (assumed)	14	36.44	no	53.01	no
62	2/10-11/97	attachments to a USEPA Region 4 memo to Marshall Hyatt from Mike Bowden dated April 15, 1997	10	1.0 (assumed)	10	32.46	no	46.66	no
45	2/13-14/97	attachments to a USEPA Region 4 memo to Marshall Hyatt from Mike Bowden dated April 15, 1997	14	1.0 (assumed)	14	24.68	no	34.50	no
51	2/(?)/97	Toxicity Identification Evaluation of the Washington, Georgia WWTP Effluent - 9/30/97, Integrated Laboratory Systems (for EPA)	16	1.0 (assumed)	16	27.47	no	38.82	no
55	4/(?)/97	Toxicity Identification Evaluation of the Washington, Georgia WWTP Effluent - 9/30/97, Integrated Laboratory Systems (for EPA)	25	1.0 (assumed)	25	29.30	no	41.68	no
66	4/(?)/97	Toxicity Identification Evaluation of the Washington, Georgia WWTP Effluent - 9/30/97, Integrated Laboratory Systems (for EPA)	15	1.0 (assumed)	15	34.24	no	49.49	no
60	5/(?)/97	Toxicity Identification Evaluation of the Washington, Georgia WWTP Effluent - 9/30/97, Integrated Laboratory Systems (for EPA)	26	1.0 (assumed)	26	31.56	no	45.24	no
62	5/(?)/97	Toxicity Identification Evaluation of the Washington, Georgia WWTP Effluent - 9/30/97, Integrated Laboratory Systems (for EPA)	29	1.0 (assumed)	29	32.46	no	46.66	no
55	6/(?)/97	Toxicity Identification Evaluation of the Washington, Georgia WWTP Effluent - 9/30/97, Integrated Laboratory Systems (for EPA)	42	1.0 (assumed)	42	29.30	**yes**	41.68	**yes**
69	7/(?)/97	Toxicity Identification Evaluation of the Washington, Georgia WWTP Effluent - 9/30/97, Integrated Laboratory Systems (for EPA)	14	1.0 (assumed)	14	35.56	no	51.61	no
55	9/(?)/97	Toxicity Identification Evaluation of the Washington, Georgia WWTP Effluent - 9/30/97, Integrated Laboratory Systems (for EPA)	19	1.0 (assumed)	19	29.30	no	41.68	no
45 (assumed)	1/31/99	Permits Compliance System database	20	1.0 (assumed)	20	24.68	no	34.50	no
45 (assumed)	2/28/99	Permits Compliance System database	< 20	1.0 (assumed)	< 20	24.68	no	34.50	no
45 (assumed)	3/31/99	Permits Compliance System database	< 20	1.0 (assumed)	< 20	24.68	no	34.50	no
45 (assumed)	4/30/99	Permits Compliance System database	< 20	1.0 (assumed)	< 20	24.68	no	34.50	no
45 (assumed)	5/31/99	Permits Compliance System database	< 20	1.0 (assumed)	< 20	24.68	no	34.50	no
45 (assumed)	6/30/99	Permits Compliance System database	< 20	1.0 (assumed)	< 20	24.68	no	34.50	no
45 (assumed)	7/31/99	Permits Compliance System database	< 20	1.0 (assumed)	< 20	24.68	no	34.50	no
45 (assumed)	8/31/99	Permits Compliance System database	< 20	1.0 (assumed)	< 20	24.68	no	34.50	no
45 (assumed)	9/30/99	Permits Compliance System database	< 20	1.0 (assumed)	< 20	24.68	no	34.50	no
45 (assumed)	10/31/99	Permits Compliance System database	< 20	1.0 (assumed)	< 20	24.68	no	34.50	no
45 (assumed)	11/30/99	Permits Compliance System database	< 20	1.0 (assumed)	< 20	24.68	no	34.50	no
45 (assumed)	12/31/99	Permits Compliance System database	< 20	1.0 (assumed)	< 20	24.68	no	34.50	no
45 (assumed)	1/31/00	Permits Compliance System database	< 20	1.0 (assumed)	< 20	24.68	no	34.50	no
78	2/7-8/00	EPA Region 4's Science and Ecosystem Support Division	7.2	1.0 (assumed)	7.2	39.49	no	57.93	no
72	2/9-10/00	EPA Region 4's Science and Ecosystem Support Division	9.9	1.0 (assumed)	9.9	36.88	no	53.72	no
75	2/10-11/00	EPA Region 4's Science and Ecosystem Support Division	9.2	1.0 (assumed)	9.2	38.19	no	55.82	no
74	2/11-12/00	EPA Region 4's Science and Ecosystem Support Division	10	1.0 (assumed)	10	37.75	no	55.12	no
69	2/12-13/00	EPA Region 4's Science and Ecosystem Support Division	9.5	1.0 (assumed)	9.5	35.56	no	51.61	no
61	2/14-15/00	EPA Region 4's Science and Ecosystem Support Division	9.5	1.0 (assumed)	9.5	32.01	no	45.95	no
80	2/22-23/00	EPA Region 4's Science and Ecosystem Support Division	9.1	1.0 (assumed)	9.1	40.36	no	59.32	no
72	2/23-24/00	EPA Region 4's Science and Ecosystem Support Division	8.9	1.0 (assumed)	8.9	36.88	no	53.72	no
71	2/24-25/00	EPA Region 4's Science and Ecosystem Support Division	10	1.0 (assumed)	10	36.44	no	53.01	no
78	2/25-26/00	EPA Region 4's Science and Ecosystem Support Division	8	1.0 (assumed)	8	39.49	no	57.93	No
72	2/26-27/00	EPA Region 4's Science and Ecosystem Support Division	7.9	1.0 (assumed)	7.9	36.88	no	53.72	No
79	2/27-28/00	EPA Region 4's Science and Ecosystem Support Division	6.5	1.0 (assumed)	6.5	39.92	no	58.63	No
45 (assumed)	2/29/00	Permits Compliance System database	< 20	1.0 (assumed)	< 20	24.68	no	34.50	No