Total Maximum Daily Load

Evaluation

For

Two Segments in the Ogeechee River Basin

Casey Canal and Hayners Creek

(Dieldrin in Fish Tissue)

Submitted to:

The U.S. Environmental Protection Agency
Region 4
Atlanta, Georgia

Submitted by:
The Georgia Department of Natural Resources
Environmental Protection Division
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1.0 INTRODUCTION

1.1 Background

The State of Georgia 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, supporting, partially supporting, or not supporting their designated uses, depending on water quality assessment results. These water bodies are found on Georgia's 305(b) list 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 305(b) partially and not supporting water bodies are also assigned to Georgia's 303(d) list, also named after that section of the CWA. Water bodies on the 303(d) list are required to have a Total Maximum Daily Load (TMDL) evaluation for the water quality constituent(s) in violation of the water quality standard. 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. This allows water quality-based controls to be developed to reduce pollution and to restore and maintain water quality.

The State of Georgia has identified two segments that are not supporting their designated use under fish consumption guidelines due to dieldrin contamination. These segments are three miles of Casey Canal from DeRenne Avenue to Montgomery Crossroad, and two miles of Hayners Creek from Montgomery Crossroad to the confluence with the Vernon River. Both of these segments are also listed for fecal coliform and dissolved oxygen, and separate TMDLs have been prepared for these constituents.

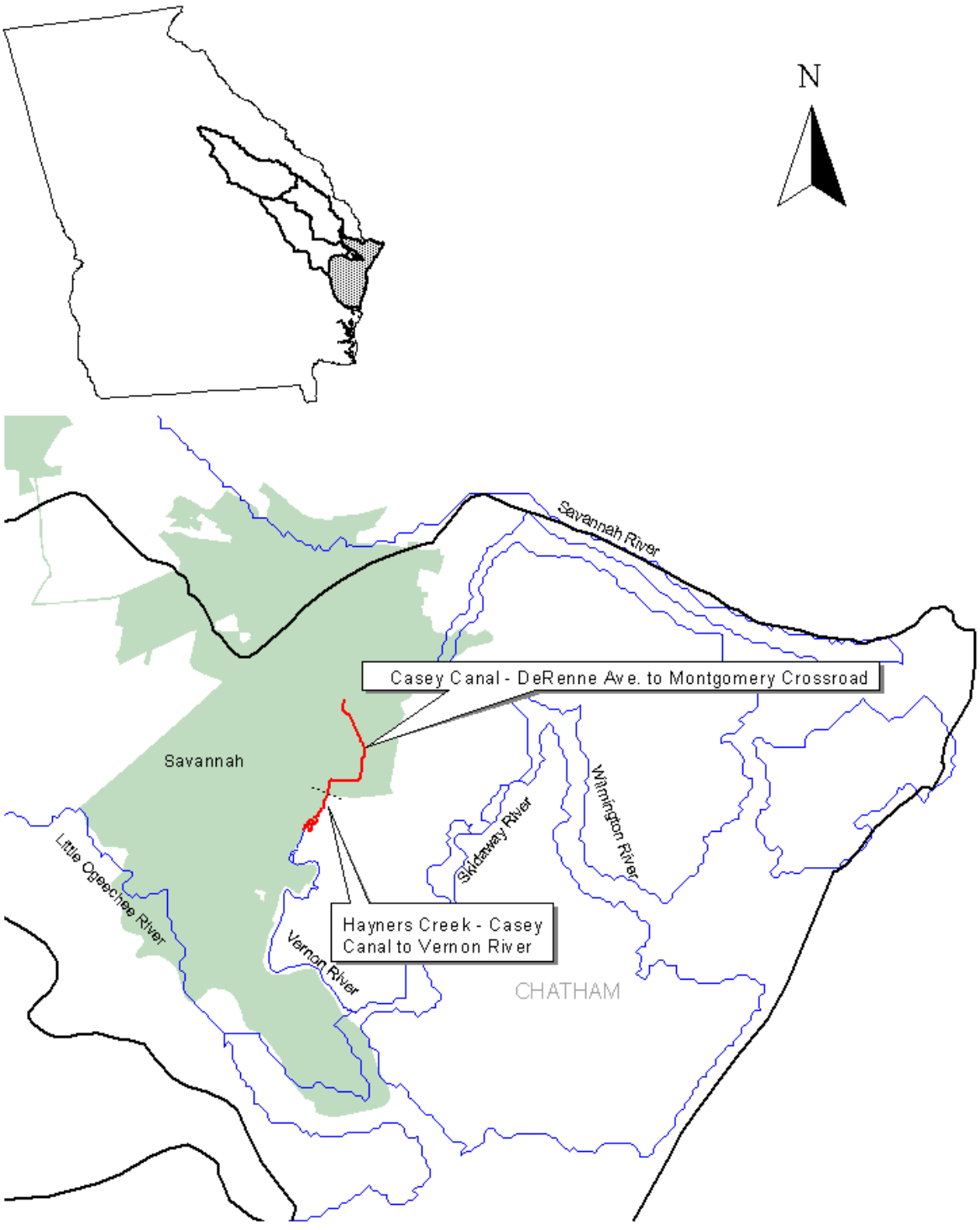
1.2 Watershed Description

The headwaters of Casey Canal are located within the city limits of Savannah in Chatham County, Georgia (see Figure 1). The surrounding areas are mostly urban. Casey Canal flows southward to Montgomery Crossroad, where there is a tidal gate. Downstream from the tidal gate, Casey Canal becomes Hayners Creek. The creek continues to flow south into the Vernon River, which then flows into the Ossabaw Sound. Along the upper segments of Hayners Creek are homes with recreational docks. Further downstream, the Creek is surrounded by saltwater marshes. Both Casey Canal and Hayners Creek are located in the Coastal Plain physiographic province.

1.3 Impacts of Dieldrin

This TMDL is for dieldrin; however, information is provided regarding aldrin since aldrin changes to dieldrin in the environment. Aldrin and dieldrin are the common names of two structurally similar compounds that were once used as insecticides. They are chemicals that are made in the laboratory and do not occur naturally in the environment. These chemicals are no longer produced or used. From the 1950's until 1970, aldrin and dieldrin were used extensively as insecticides on crops such as corn and cotton. The U.S. Department of Agriculture canceled all uses of aldrin and dieldrin in 1970. However, in 1972, EPA approved aldrin and dieldrin for killing termites. Use of aldrin and dieldrin to control termites continued until 1987. In 1987, the manufacturer voluntarily canceled the registration of the compounds for use in controlling

termites.



TMDL Evaluation - Dieldrin in Fish Tissue Ogeechee River Basin	Figure 1. Impaired Stream Segments in HUC 03060204

In the environment, dieldrin does not easily dissolve in water. It attaches to soil and sediment at the bottom of lakes, ponds and streams. Dieldrin is lipophilic in that it tends to accumulate in the fatty tissue of fish and wildlife, and is also known to bioaccumulate in various organisms.

There is a dieldrin standard for fish consumption published by the Food and Drug Administration (FDA), as well as guidelines published by the State of Georgia. This document will not detail the human health problems or wildlife threats posed by this chemical; the reader may consult the references in this TMDL for more detailed information. The Agency for Toxic Substances and Disease Registry (ATSDR), which is an agency of the U.S. Department of Health and Human Services, and the U.S. Environmental Protection Agency are both good sources of information on dieldrin. Much of the background information provided in this section, as well as additional information, can be found on their websites.

1.4 Water Quality Standard

The water use classifications for Casey Canal and Hayners Creek are fishing. The fishing classification, as stated in Georgia's *Rules and Regulations for Water Quality Control,* Chapter 391-3-6-.03(6)(c), is established to protect the "propagation of fish, shellfish, game and other aquatic life, secondary contact recreation in and on the water; or for any other use requiring water of a lower quality" (GA EPD, 2004).

Georgia's instream criteria for dieldrin and aldrin are established for all waters and are deemed to be necessary and applicable to all waters of the State. Georgia's *Rules and Regulations for Water Quality Control*, Chapter 391-3-6-.03(5)(e)(iv) states:

> Instream concentrations of the following chemical constituents listed by the U. S. Environmental Protection Agency as toxic priority pollutants pursuant to Section 307(a)(1) of the Federal Clean Water Act (as amended) shall not exceed criteria indicated below under annual average or higher stream flow conditions:
>
> | | |
> |---|---|
> | Aldrin | 0.00014μg/L |
> | Dieldrin | 0.00014 μg/L |

(GA EPD, 2004). The instream water quality standard for both dieldrin and aldrin is protective of the FDA action level for fish consumption. This standard is also protective of the DNR fish consumption advisory action level. In addition, Georgia's *Rules and Regulations for Water Quality Control*, Chapter 391-3-6-.03(5)(e)(iii) states:

> Instream concentrations of the following chemical constituents listed by the U. S. Environmental Protection Agency as toxic priority pollutants pursuant to Section 307(a)(1) of the Federal Clean Water Act (as amended) shall not exceed criteria indicated below 7-day, 10-year minimum flow (7Q10) or higher stream flow conditions except within established mixing zones or in accordance with site specific effluent limitations developed in accordance with procedures presented in 391-3-6-.06.
>
> | | |
> |---|---|
> | Dieldrin | |
> | (a) Freshwater | 0.056 μg/L* |
> | (b) Coastal and Marine Estuarine Waters | 0.0019 μg/L* |
>
> *The in-stream criterion is lower than the EPD laboratory detection limits.

(GA EPD, 2004). This TMDL will protect both of these standards.

2.0 AVAILABLE MONITORING DATA

Dieldrin was detected in fish tissue from Casey Canal near Montgomery Crossroads. 1997 fish tissue data had a range of total dieldrin from Non-Detected (≤0.020 mg/kg) to 0.08 mg/kg. The 1997 data triggered the fish consumption guideline of one meal per week as listed in the *2003 Update of Guidelines for Eating Fish from Georgia Waters* (GA DNR, 2002). The specific species listed with the recommended consumption limit of 1 meal per week is Striped Mullet. There are No Restrictions limits for Largemouth Bass and Bluegill Sunfish.
The most conservative approach of using the highest value will be used for developing this TMDL.

3.0 SOURCE ASSESSMENT

A source assessment characterizes the known and suspected sources of dieldrin in the watershed for use in a water quality model and the development of the TMDL. The sources of dieldrin in this watershed are unknown, but they may come from either point sources or nonpoint sources. Both will be addressed in this TMDL.

Title IV of the Clean Water Act establishes the National Pollutant Discharge Elimination System (NPDES) permit program. Basically, there are two categories of NPDES permits: 1) municipal and industrial wastewater treatment facilities, and 2) regulated storm water discharges.

In general, industrial and municipal wastewater treatment facilities have NPDES permits with effluent limits. These permit limits are either based on federal and state effluent guidelines (technology-based limits) or on water quality standards (water quality-based limits). Dieldrin is a toxic priority pollutant and its use and discharge is not permitted in any of the listed segments. There are no permitted point source dischargers with existing allocations for dieldrin.

Some storm water runoff is covered under the NPDES Permit Program. It is considered a diffuse source of pollution. Unlike other NPDES permits that establish end-of-pipe limits, storm water NPDES permits establish controls. Currently, regulated storm water discharges include those associated with industrial activities, including construction sites disturbing one acre or greater, and large, medium, and small municipal separate storm sewer systems (MS4s).

Storm water discharges associated with industrial activities are currently covered under a General Storm Water NPDES Permit. This permit requires visual monitoring of storm water discharges, site inspections, implementation of Best Management Practices (BMPs), and record keeping. There are several industrial and construction sites in this watershed.

Storm water discharges from MS4s are very diverse in pollutant loadings and frequency of discharge. At present, all cities and counties within Georgia that had a population of greater than 100,000 at the time of the 1990 Census are permitted for storm water discharge. This includes 60 permittees, 45 of which are located in the greater Atlanta metro area. Within the listed watersheds, Chatham County and the City of Savannah are covered under Phase I MS4 permits. The MS4 permits require the prohibition of non-storm water discharges (i.e., illicit discharges) into the storm sewer systems, and controls to reduce the discharge of pollutants to the maximum extent practicable, including the use of management practices, control techniques and systems, and design and engineering methods (Federal Register, 1990). A site-specific management plan outlining appropriate controls is referenced in the permit.

Sources of dieldrin in the listed segments may be attributed to contamination of urban runoff and nonpoint source pollution. Other possible sources may include movement of contaminated bedload sediment, soil erosion, and air deposition. It is likely that the dieldrin measured in fish tissue in 1997 was due to legacy contamination and no current sources exist.

4.0 TMDL DEVELOPMENT APPROACH

An important component of TMDL development is to establish relationships between source loadings and instream water quality. In this section, the numerical modeling techniques used to develop the TMDL are discussed.

4.1 Steady-State Mass Balance Approach

A mass balance equation is used to calculate the TMDL. The TMDL for Casey Canal and Hayners Creek equals the water quality standard for all flows. At this time, there is no water column dieldrin data for dieldrin. However, fish tissue concentrations are known and there is a published bioaccumulation factor for dieldrin in fish tissue (USEPA, 2002). Therefore, the water column concentration that resulted in the fish tissue concentration can be estimated using the equation below.

$$WC = TC/BCF$$

Where: WC = Water column concentration (mg/L)
TC = Fish tissue concentration (mg/kg)
BCF = EPA bioaccumulation factor (4,670 L/kg)

$$WC = (0.080 \text{ mg/kg}) / (4{,}670 \text{ L/kg})$$
$$WC = 0.0000171 \text{ mg/L}$$
$$WC = 0.0171 \ \mu\text{g/L}$$

This calculated water column concentration is compared to the water quality standard to determine the percent reduction required by this TMDL.

4.2 Critical Conditions

Georgia has a human health based water quality standard for dieldrin that is based on the average annual stream flow. This standard, if met, will protect against contaminated fish tissue. However, this standard is several orders of magnitude less than the current detection limit for dieldrin.

5.0 ALLOCATION

A Total Maximum Daily Load (TMDL) is the amount of a pollutant that can be assimilated by the receiving waterbody without exceeding the applicable water quality standard. A TMDL is the sum of the individual waste load allocations (WLAs) and load allocations (LAs) for nonpoint sources and natural background (40 CFR 130.2) for a given waterbody. The TMDL must also include a margin of safety (MOS), either implicitly or explicitly, that accounts for the uncertainty in the relationship between pollutant loads and the water quality response of the receiving water body. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measures. For dieldrin, the TMDLs are expressed as a concentration and as a percent reduction.

A TMDL is expressed as follows:

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

The TMDL calculates the WLAs and LAs with margins of safety to meet the stream's water quality standards. The allocations are based on estimates that use the best available data and provide the basis to establish or modify existing controls so that water quality standards can be achieved. In developing a TMDL, it is important to consider whether adequate data are available to identify the sources, fate, and transport of the pollutant to be controlled.

TMDLs may be developed using a phased approach. Under a phased approach, the TMDL includes: 1) WLAs that confirm existing limits and controls or lead to new limits, and 2) LAs that confirm existing controls or include implementing new controls (USEPA, 1991). A phased TMDL requires additional data be collected to determine if load reductions required by the TMDL lead to the attainment of water quality standards.

The TMDL Implementation Plan will establish a schedule or timetable for the installation and evaluation of point and nonpoint source control measures, data collection, assessment of water quality standard attainment, and if needed, additional modeling. Future monitoring of the listed segment water quality will then be used to evaluate this phase of the TMDL, and if necessary, to reallocate the loads.

The following sections describe the dieldrin TMDL components.

5.1 Waste Load Allocations

The waste load allocation (WLA) is the portion of the receiving water's loading capacity that is allocated to existing or future point sources. Waste load allocations are provided to the point sources from municipal and industrial wastewater treatment systems that have NPDES effluent limits.

State and federal rules define storm water discharges covered by NPDES permits as point sources. However, storm water discharges are from diffuse sources and there are multiple storm water outfalls. Storm water sources (point and nonpoint) are different than traditional NPDES permitted sources in four respects: 1) they do not produce a continuous (pollutant loading) discharge; 2) their pollutant loading depends on the intensity, duration, and frequency of rainfall events, over which the permittee has no control; 3) the activities contributing to the pollutant loading may include various allowable activities of others, and control of these activities is not solely within the discretion of the permittee; and 4) they do not have wastewater

treatment plants that control specific pollutants to meet numerical limits.
The intent of storm water NPDES permits is not to treat the water after collection, but to reduce the exposure of storm water to pollutants by implementing various controls. It would be infeasible and prohibitively expensive to control pollutant discharges from each storm water outfall. Therefore, storm water NPDES permits require the establishment of controls or BMPs to reduce pollutants from entering the environment.

There are no permitted point source dischargers with existing allocations for dieldrin. Thus, the wasteload allocation (WLA) for dieldrin is not applicable at this time. It is known that wastewaters can contain trace levels of chemicals, including dieldrin. The current detection limit for dieldrin is above the current water quality standard. However, there may come a time when very low concentrations of dieldrin in discharges or storm water can be measured. If individual wasteload allocations for dieldrin are needed for specific permits, the wasteload allocations can be calculated by multiplying the design flows (Q) by the human health criteria (0.00014 μg/L dieldrin).

5.2 Load Allocations

The load allocation (LA) is the portion of the receiving water's loading capacity that is attributed to existing or future nonpoint sources or to natural background sources. Nonpoint sources are identified in 40 CFR 130.6 as follows:

- Residual waste;
- Land disposal;
- Agricultural and silvicultural;
- Mines;
- Construction;
- Saltwater intrusion; and
- Urban storm water (non-permitted).

The nonpoint sources can include air deposition, stormwater runoff, movement from sediment bedload into the water column, and decaying aquatic organisms. These mechanisms are very complicated and difficult to quantify.

Nonpoint source concentrations should be equivalent to or less than the water quality standard for dieldrin. Thus, the load allocation (LA) allows for no loads that cause or contribute to instream mixed water column dieldrin concentrations above 0.00014 μg/L.

5.3 Seasonal Variation

Seasonal variation is not applicable to this TMDL because there are no known point or nonpoint sources. The water quality standard is based on human health guidelines and is targeted to be met at flows greater than or equal to the annual average flow. Dieldrin will accumulate in fish tissue throughout the year. The mechanism causing higher concentrations of a pollutant in the water column during low flows could be offset by the suspension of particles during heavy flows and rain.

5.4 Margin of Safety

This TMDL is very conservative in that it uses the highest fish tissue concentration from 1997 and assumes that this value is still representative. It requires the dieldrin criteria to be met at the end of pipe for any wasteloads and also for all load allocations. Water column data for dieldrin does not exist or has not been detected in Casey Canal or Hayners Creek.

This TMDL will use the conservative assumption that the water column throughout all listed segments has no assimilative capacity for dieldrin loadings at concentrations above the water quality standards.

5.5 TMDL Results

The TMDL for Casey Canal and Hayners Creek equals the water quality standard. This TMDL can be summarized as follows:

Table 1. Dieldrin TMDL Allocation

Location	WLA	LA	MOS	TMDL
Casey Canal	$\Sigma(Q_{WLA}$*0.00014μg/L)	$\Sigma(Q_{LA}$*0.00014μg/L)	Implicit	$\Sigma(Q_{total}$*0.00014μg/L)
Hayners Creek	$\Sigma(Q_{WLA}$*0.00014μg/L)	$\Sigma(Q_{LA}$ *0.00014μg/L)	Implicit	$\Sigma(Q_{total}$ *0.00014μg/L)

5.6 Load Reduction

The calculated water column concentration that resulted in the fish tissue contamination is estimated to be 0.0171 μg/L (see Section 4.1). The required load reduction is shown in Table 2.

Table 2. Load Reduction

Parameter	Current Calculated Water Column Concentration	TMDL Water Column Concentration	Percent Reduction
Dieldrin	0.0171 μg/L	0.00014 μg/L	99.18

6.0 RECOMMENDATIONS

6.1 Monitoring

The State should continue with its monitoring program of fish tissue in Georgia's waters. If dieldrin is detected in fish tissue above the level that triggers fish consumption guidelines to be issued, the TMDL implementation phase should begin with more detailed monitoring and source assessment.

6.2 Reasonable Assurance

There currently are no NPDES permitted discharges to Casey Canal or Hayners Creek for dieldrin. If a permit were to be issued in the future, an allocation to a point source discharger does not automatically result in a permit limit or a monitoring requirement. Through its NPDES permitting process, Georgia will determine whether the permitted dischargers to the watersheds have a reasonable potential of discharging dieldrin levels equal to or greater than the allocated load. The results of this reasonable potential analysis will determine the specific type of requirements in an individual facility's NPDES permit. As part of its analysis, the EPD will use its EPA-approved 2001 NPDES Reasonable Potential Procedures to determine whether monitoring requirements or effluent limitations are necessary.

If effluent limitations are determined to be necessary for any future facilities, they should be established in accordance with Georgia's *Rules and Regulations for Water Quality Control*, Chapter 391-3-6-.06(4)(d)5.(ii)(b)(2) (GA EPD, 2004). This regulation establishes that to protect against chronic effects, an effluent limitation should be imposed as a monthly average limit. To protect against acute effects, an effluent limitation should be imposed as a daily maximum limit. Additionally, if effluent limitations or monitoring requirements are determined through a reasonable potential analysis to be necessary for any future facilities, it is recommended that concentration limits or concentration monitoring requirements should be imposed in addition to any loading limits or monitoring requirements.

6.3 Non-Point Source Management Practices

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

6.4 Public Participation

A thirty-day public notice will be provided for this TMDL. During this time, the availability of the TMDL will be public noticed, a copy of the TMDL will be provided upon request, and the public will be invited to provide comments on the TMDL. This TMDL will be modified to address the comments received.

7.0 INITIAL TMDL IMPLEMENTATION PLAN

GA EPD has coordinated with EPA to prepare this Initial TMDL Implementation Plan for this TMDL. GA EPD has also established a plan and schedule for development of a more comprehensive implementation plan after this TMDL is established. GA 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 GA EPD and/or Regional Development Centers (RDCs) or other GA EPD contractors (hereinafter, "GA EPD Contractors") will develop expanded plans (hereinafter, "Revised TMDL Implementation Plans").

This Initial TMDL Implementation Plan, written by GA EPD and for which GA EPD and/or the GA 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. GA EPD and the GA EPD Contractor will select and implement one or more 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. GA 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 pollutant categories of concern for the respective River Basin as identified in the TMDLs. 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 GA EPD Contractor and approved by GA 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 GA EPD approves. If for any reason the GA EPD Contractor does not complete the BMP demonstration project, GA EPD will take responsibility for doing so.

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

4. If for any reason the GA EPD Contractor does not complete one or more elements of a Revised TMDL Implementation Plan, GA 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 December 2006.

6. The GA EPD Contractor helping to develop the Revised TMDL Implementation Plan, in coordination with GA 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 a monitoring plan, taking into account available resources, to measure effectiveness; and
   H. Complete and submit to GA 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.

8. The Revised TMDL Implementation Plan will supersede this Initial TMDL Implementation Plan once GA EPD approves the Revised TMDL Implementation Plan.

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		_			_				

Land Use	Management Measures	Fecal Coliform	Dissolved Oxygen	PH	Sediment	Temperature	*Toxicity*	*Mercury*	Metals (copper, lead, zinc, cadmium)	PCBs, toxaphene
	10. Wetlands Forest Management	–	–	–		–		–		

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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