TABLE OF CONTENTS

Chapter	Title	Page
FORWARD		i
EXECUTIVE SUMMARY		ii
TABLE OF CONTENTS		xiii
1.	INTRODUCTION	*1* - 1
1.1	Purpose of this Document	*1* - 1
1.2	Guide to Use of this Document	*1* - 2
1.3	North Carolina's Basinwide Management Approach	*1* - 3
1.4	Basinwide Responsibilities within the NCDEM Water Quality Section	*1* - 6
1.5	State and Federal Legislative Authorities for NC's Water Quality Program	*1* - 8
1.5.1	Federal Authorities	*1* - 8
1.5.2	State Authorities	*1* - 9
2.	GENERAL BASIN DESCRIPTION WITH WATER QUALITY CLASSIFICATIONS AND STANDARDS	*2* - 1
2.1	French Broad River Basin Overview	*2* - 1
2.2	Basin Hydrology and the Three Major Watersheds	*2* - 1
2.3	Local Government and Planning Jurisdictions within the Basin	*2* - 6
2.4	Land Cover, Population and Growth Trends	*2* - 7
2.4.1	General Land Cover	*2* - 7
2.4.2	Population and Growth Trends in the Basin	*2* - 9
2.5	Registered Animal Operations	*2* - 13
2.6	Surface Water Classifications and Water Quality Standards	*2* - 13
2.6.1	Program Overview	*2* - 13
2.6.2	Statewide Classifications and Water Quality Standards	*2* - 14
2.6.3	Surface Water Classifications in the French Broad Basin	*2* - 15
3.	CAUSES & SOURCES OF WATER POLLUTION IN THE BASIN	*3* - 1
3.1	Introduction	*3* - 1
3.2	Causes of Pollution	*3* - 1
3.2.1	Oxygen Consuming Wastes	*3* - 1
3.2.2	Nutrients	*3* - 3
3.2.3	Toxic Substances	*3* - 5
3.2.4	Sediment	*3* - 6
3.2.5	Fecal Coliform Bacteria	*3* - 8
3.2.6	Color	*3* - 9
3.3	Point Sources of Pollution	*3* - 9
3.3.1	Defining Point Sources	*3* - 9
3.3.2	Point Source Discharges in the French Broad	*3* - 10
3.4	Nonpoint Sources of Pollution	*3*- 13
3.4.1	Agriculture	*3* - 13
3.4.2	Urban	*3* - 13
3.4.3	Construction	*3* - 13
3.4.4	Forestry	*3* - 14

TABLE OF CONTENTS (Continued)

Chapter	Title	Page
	(CHAPTER 3 continued)	
	3.4.5 Mining	3 - 14
	3.4.6 Onsite Wastewater Disposal	3 - 14
	3.4.7 Solid Waste Disposal	3 - 15
	References	3 - 15
4.	WATER QUALITY AND USE SUPPORT RATINGS IN THE BASIN	4 - 1
	4.1 Introduction	4 - 1
	4.2 Water Quality Monitoring Programs	4 - 1
	4.2.1 Benthic Macroinvertebrate Monitoring	4 - 1
	4.2.2 Fisheries Monitoring	4 - 2
	4.2.3 Lake Assessment Program	4 - 3
	4.2.4 Aquatic Toxicity Monitoring	4 - 3
	4.2.5 Chemical/Physical Characterizations	4 - 3
	4.2.6 Sediment Oxygen Demand	4 - 4
	4.2.7 Ambient Monitoring System	4 - 4
	4.3 Narrative Water Quality Summaries by Subbasin	4 - 5
	4.3.1 Subbasin 01 - French Broad River Headwaters	4 - 5
	4.3.2 Subbasin 02 - Upper French Broad River	4 - 8
	4.3.3 Subbasin 03 - Mills and Davidson Rivers	4 - 10
	4.3.4 Subbasin 04 - Lower French Broad and Ivy Creek	4 - 12
	4.3.5 Subbasin 05 - Pigeon River	4 - 12
	4.3.6 Subbasin 06 - Nolichucky, North Toe and South Toe Rivers	4 - 16
	4.3.7 Subbasin 07 - Cane River	4 - 18
	4.4 Use Support: Definitions and Methodology	4 - 20
	4.5 Use Support Ratings for the French Broad River Basin	4 - 20
	4.5.1 Freshwater Streams and Rivers	4 - 20
	4.5.2 Lakes	4 - 27
	References	4 - 28
5.	EXISTING POINT AND NONPOINT SOURCE POLLUTION CONTROL PROGRAMS	5 - 1
	5.1 Introduction	5 - 1
	5.2 North Carolina's Point Source Control Program	5 - 1
	5.2.1 Introduction	5 - 1
	5.2.2 NPDES Permits Review and Processing	5 - 1
	5.2.3 Establishing Discharger Permit Effluent Limitations/Wasteload Allocations	5- 2
	5.2.4 Compliance Monitoring and Enforcement	5- 3
	5.2.5 Aquatic Toxicity Testing	5- 3
	5.2.6 Pretreatment Program	5- 4
	5.2.7 Operator Certification and Training Program	5- 5
	5.2.8 Nondischarge and Regionalized Wastewater Treatment Alternatives	5- 5

TABLE OF CONTENTS (Continued)

Chapter	Title	Page
	(CHAPTER 5 continued)	
	5.3 Nonpoint Source Control Programs	5 - 5
	5.3.1 Agricultural Nonpoint Source Control Programs	5 - 8
	5.3.2 NPS Programs for Urban and Developed Lands	5 - 12
	5.3.3 Construction-Sedimentation and Erosion Control NPS Program	5 - 15
	5.3.4 On-Site Wastewater Disposal Sanitary-Sewage Systems NPS Program	5 - 15
	5.3.5 Solid Waste Disposal NPS Programs	5 - 16
	5.3.6 Forestry NPS Programs	5 - 17
	5.3.7 Mining NPS Program	5 - 18
	5.3.8 Wetlands Regulatory NPS Programs	5 - 18
	5.3.9 Hydrologic Modification	5 - 20
	5.4 Integrating Point and Nonpoint Source Pollution Control Strategies	5 - 20
	References	5 - 21
6.	MAJOR WATER QUALITY CONCERNS, GOALS AND RECOMMENDED MANAGEMENT STRATEGIES FOR THE FRENCH BROAD RIVER BASIN	6 - 1
	6.1 Basinwide Management Goals	6 - 1
	6.2 Major Water Quality Concerns and Priority Issues	6 - 1
	6.2.1 Identifying and Restoring Impaired Waters	6 - 1
	6.2.2 Identification and Protection of High Resource Value or Biologically Sensitive Waters	6 - 4
	6.2.3 Managing Problem Pollutants in order to Protect Waters Currently Supporting their Uses	6 - 6
	6.3 Toxic Substances	6 - 6
	6.3.1 Assimilative Capacity	6 - 6
	6.3.2 Control Strategies	6 - 7
	6.4 Management Strategies for Controlling Sedimentation	6 - 10
	6.5 Management Strategies for Nutrients	6 - 12
	6.6 Recommended Management Strategies for Oxygen-consuming Wastes	6 - 13
	6.6.1 French Broad River Watershed (Subbasins 04-03-01 to 04)	6 - 14
	6.6.2 Pigeon River Watershed (Subbasin 04-03-05)	6 - 18
	6.6.3 Nolichucky River Watershed (Subbasins 04-03-06 and 07)	6 - 20
	6.7 Management Strategies for Stormwater Control	6 - 21
	6.7.1 HQW, ORW and Water Supply Areas	6 - 21
	6.7.2 NPDES Stormwater Management	6 - 21
	6.7.3 Recommendations for Controlling Stormwater Impacts by Local Governments Not Subject to NPDES Stormwater Requirements	6 - 21
	6.8 Management Strategies for Fecal Coliform Bacteria	6 - 22
	References	6 - 22

APPENDICES

Appendix	Title	Page
I	NORTH CAROLINA'S SURFACE WATER CLASSIFICATIONS AND WATER QUALITY STANDARDS	*A - I* - 1
	• Summary of North Carolina's Water Quality Classifications and Standards	*A - I* - 2
	• Anti-Degradation Policy and High Quality Waters (15A NCAC 2B .0201)	*A - I* - 8
	• Outstanding Resource Waters (15A NCAC 2B .0216)	*A - I* - 11
II	WATER QUALITY DATA COLLECTED BY DEM	*A - II* - 1
	• Benthic Macroinvertebrate Sampling	*A - II* - 2
	• Fisheries Studies	*A - II* - 8
	• Lakes Assessment Procedure	*A - II* - 13
	• Aquatic Toxicity Testing	*A - II* - 14
III	MODELING INFORMATION	*A - III* - 1
IV	PUBLIC WORKSHOP SUMMARY	*A - IV* - 1
V.	USE SUPPORT RATING METHODOLOGY	*A - V* - 1
VI.	LISTS OF BEST MANAGEMENT PRACTICES	*A - VI* - 1
	• Agriculture	*A - VI* - 2
	• Urban Runoff	*A - VI* - 8
	• Sedimentation and Erosion Control	*A - VI* - 9
	• Onsite Wastewater Disposal	*A - VI* - 10
	• Forestry	*A - VI* - 13
	• Mining	*A - VI* - 14

LIST OF FIGURES

Figure	Title	Page
1	General Map of the French Broad River Basin	iv
1.1	Basinwide Management Plan Schedule (1994 to 1998)	*1* - 1
1.2	Organizational Structure of the DEM Water Quality Section	*1* - 7
2.1	Physiographic Regions and Major River Basins in North Carolina	*2* - 2
2.2	Three Major Watersheds of the French Broad River Basin	*2* - 3
2.3	General Map of the French Broad River Basin	*2* - 4
2.4	1990 Population Density by Census Block Group	*2* - 11
2.5	Population Growth Increases by Subbasin Between 1970 and 1990	*2* - 12
2.6	Water Supply Watersheds, High Quality Waters and Outstanding Resource Waters in the French Broad River Basin	*2* - 16
2.7	Water Supply Watersheds and HQW/ORW Waters in the French Broad River Watershed	*2* - 17
2.8	Water Supply Watersheds and HQW/ORW Waters in the Pigeon River Watershed	*2* - 18
2.9	Water Supply Watersheds and HQW/ORW Waters in the Nolichucky River Watershed	*2* - 19
3.1	Comparison of Total BOD Loading and Effluent Flows from NPDES Dischargers in the French Broad River Basin Between the Mid 1970's and 1993	*3* - 2
3.2	Comparison Between Mid-1970s and 1993 Loading of Biochemical Oxygen Demand (BOD) from Municipal Wastewater Treatment Plants in the French Broad Basin	*3* - 4
3.3	Comparison Between Mid-1970s and 1993 Loading of Flow from Municipal Wastewater Treatment Plants in the French Broad Basin	*3* - 4
3.4	Distribution Map of Dischargers in the French Broad River Basin	*3* - 11
4.1a	Ambient and Fish Tissue Monitoring Stations in Subbasin 01 (French Broad Headwaters)	*4* - 6
4.1b	Benthic Monitoring Stations in Subbasin 01 (French Broad Headwaters)	*4* - 7
4.2	Water Quality Monitoring Stations in Subbasin 02 (Upper French Broad)	*4* - 9
4.3	Water Quality Monitoring Stations in Subbasin 03 (Mills and Davidson Rivers)	*4* - 11

LIST OF FIGURES (continued)

Figure	Title	Page
4.4	Water Quality Monitoring Stations in Subbasin 04 (Lower French Broad and Ivy Creek)	*4* - 13
4.5	Water Quality Monitoring Stations in Subbasin 05 (Pigeon River Watershed)	*4* - 14
4.6	Water Quality Monitoring Stations in Subbasin 06 (Nolichucky/North Toe Rivers)	*4* - 17
4.7	Water Quality Monitoring Stations in Subbasin 07 (Cane River)	*4* - 19
4.8	Use Support Map for the French Broad River Basin	*4* - 24
4.9	Bar Graph Showing Freshwater Use Support Distribution of Subbasin	*4* - 25
6.1	Monitored Impaired Water Bodies Targeted for Nonpoint Source Management	*6* - 5

LIST OF TABLES

Table	Title	Page
1.1	Basinwide Permitting and Planning Schedule for North Carolina's 17 Major River Basins (1993 through 1998)	*1* - 4
1.2	Subbasin NPDES Permit Schedule for French Broad Basin	*1* - 5
2.1	Hydrologic Divisions in the French Broad River Basin	*2* - 5
2.2	Local Governments and Local Planning Units within the Basin	*2* - 6
2.3	Land Cover in the French Broad Basin by Major Watersheds (8 Digit USGS Hydrologic Units) (USDA Soil Conservation Service - 1992 NRI)	*2* - 7
2.4	Description of Land Cover Types (1992 NRI - USDA SCS)	*2* - 8
2.5	French Broad River Subbasin Population (1970, 1980 and 1990) and Land Area Summaries	*2* - 12
2.6	Registered Animal Operations in the French Broad River Basin	*2* - 13
2.7	Freshwater Primary and Supplemental Classifications Applicable to the French Broad River Basin	*2* - 14
2.8	Water Quality Classification Statistics for the French Broad River Basin	*2* - 15
3.1	Overall Erosion Trends in North Carolina	*3* - 6
3.2	USLE Erosion on Cultivated Cropland in North Carolina	*3* - 7
3.3	North Carolina Erosion in the Blue Ridge Mountain Region	*3* - 7
3.4	North Carolina Erosion on Major Land Resource Areas (MLRA)	*3* - 7
3.5	Summary of Major/Minor Dischargers and Permitted and Actual Flows by Subbasin	*3* - 11
4.1	Ambient Monitoring System Parameters	*4* - 4
4.2	Summary of Use Support Ratings for Monitored Stream Segments (3 pages)	4 - 21
4.3	Use Support Ratings for Freshwater Streams by Subbasin	*4* - 25
4.4	Sources for Use Support Impairments in Freshwaters in the Basin	*4* - 26
4.5	Major Causes of Use Support Impairment in Freshwaters in the Basin	*4* - 26
4.6	Lakes Use Support Status and Causes and Sources of Impairment	*4* - 28

LIST OF TABLES (continued)

Table	Title	Page
5.1	Examples of Nonpoint Source Programs	5 - 7
6.1	Recommended Strategies for Monitored Impaired Streams in the Basin	6 - 2
6.2	Potential ORW and HQW Streams in the French Broad River Basin	6 - 6
6.3	State and Federal Sediment Control-related Programs	6 - 10
6.4	NC Agricultural Cost Share Program Statistics for Erosion Control in the French Broad River Basin (through January 1, 1994)	6 - 11
6.5	General Recommended Stategies for Expanding and Proposed Discharges in the French Broad River Basin	6 - 13