

TABLE OF CONTENTS

Executive Summary	xi
Section A – General Basinwide Information	1
Chapter 1 – Introduction to Basinwide Water Quality Planning	2
1.1 What is Basinwide Water Quality Planning?.....	2
1.2 Goals of Basinwide Water Quality Planning	2
1.3 Major Components of the Basinwide Plan.....	4
1.4 Benefits of Basinwide Water Quality Planning	4
1.5 How to Get Involved.....	5
1.6 Other References	5
1.7 Division of Water Quality Functions and Locations.....	6
Chapter 2 – Basin Overview.....	8
2.1 General Overview	8
2.2 Local Governments and Planning Jurisdictions in the Basin.....	12
2.3 Surface Water Hydrology.....	12
2.4 Land Cover.....	13
2.5 Population and Growth Trends	17
2.6 Natural Resources	20
2.6.1 Public Lands in the Pasquotank River Basin.....	20
2.6.2 Ecological Significance of the Pasquotank River Basin.....	20
2.6.3 Significant Natural Heritage Areas.....	23
2.6.4 Rare and Threatened Aquatic Species in the Pasquotank River Basin	25
2.6.5 Fisheries Resources	26
2.7 Permitted Wastewater and Stormwater Discharge Facilities	28
2.7.1 Wastewater Discharges in the Pasquotank River Basin	28
2.7.2 Stormwater Discharges in the Pasquotank River Basin.....	29
2.8 Animal Operations	31
2.9 Water Use.....	35
2.9.1 Local Water Supply Planning	35
2.9.2 Capacity Use Areas.....	36
2.9.3 Water Withdrawals and Interbasin Transfers	37

Chapter 3 – Summary of Water Quality Information for the Pasquotank River Basin.....	38
3.1 General Sources of Pollution	38
3.2 Description of Surface Water Classifications and Standards.....	39
3.2.1 Program Overview.....	39
3.2.2 Surface Water Classifications.....	39
3.2.3 Classifications and Standards in the Pasquotank River Basin.....	41
3.3 DWQ Water Quality Monitoring Programs in the Pasquotank River Basin.....	44
3.3.1 Benthic Macroinvertebrates	44
3.3.2 Fish Assessments	45
3.3.3 Aquatic Toxicity Monitoring.....	46
3.3.4 Lake Assessment	47
3.3.5 Ambient Monitoring System Program.....	47
3.4 Other Water Quality Research	48
3.4.1 Division of Environmental Health Shellfish Sanitation and Recreational Water Quality Section	48
3.4.2 Virginia’s Water Quality Monitoring	49
3.5 Use Support Summary	49
3.5.1 Introduction to Use Support.....	49
3.5.2 Comparison of Use Support Ratings to Streams on the Section 303(d) List	50
3.5.3 Use Support Ratings for the Pasquotank River Basin	51
Chapter 4 – Water Quality Issues Related to the Entire Pasquotank River Basin.....	59
4.1 Overview.....	59
4.2 Shellfish Harvest Issues	59
4.2.1 Division of Environmental Health Shellfish Sanitation (DEH SS).....	59
4.2.2 Changes in Shellfish Harvesting Use Support Assessment.....	61
4.2.3 Recommendations for Addressing Impaired Shellfish Harvest Waters.....	61
4.3 Biological Monitoring Issues	67
4.3.1 Draft Criteria for Assessing Benthic Macroinvertebrates in Swamp Streams	67
4.3.2 Draft Criteria for Assessing Fish Communities.....	68
4.4 Fish Consumption Advisories.....	68
4.4.1 Mercury Related Fish Consumption Advisories.....	68
4.4.2 Dioxin Related Fish Consumption Advisories	69
4.4.3 2002 Recommendations.....	70
4.5 Wetland Loss.....	71
4.5.1 Introduction.....	71
4.5.2 Physical Impacts to Wetlands and Streams	72

4.5.3	2002 Recommendations.....	73
4.6	Effects of Hurricanes on Water Quality	73
4.6.1	Contaminants	74
4.6.2	De-Snagging	74
4.6.3	2002 Recommendations.....	75
4.7	Aquaculture	75
4.7.1	2002 Recommendations.....	75
4.8	Water Control Structures.....	76
4.8.1	2002 Recommendations.....	76
4.9	Growth Management.....	76
4.9.1	Stormwater Programs	77
4.10	Priority Issues for the Next Five Years	78
4.10.1	Introduction.....	78
4.10.2	Strategies for Restoring and Protecting Impaired Waters	78
4.10.3	Addressing Waters on the State’s 303(d) List	78

Section B –	Water Quality Data and Information by Subbasin	80
Chapter 1 –	Pasquotank River Subbasin 03-01-50	
	Includes Pasquotank River and Tributaries.....	81
1.1	Water Quality Overview	81
1.2	Status and Recommendations for Previously Impaired Waters	83
1.3	Status and Recommendations for Newly Impaired Waters	84
1.4	Other Issues and Recommendations	84
1.4.1	Pasquotank River	84
1.4.2	Albermarle Sound.....	85
1.4.3	Areneuse Creek.....	85
Chapter 2 –	Pasquotank River Subbasin 03-01-51	
	Includes the Alligator River, Croatan Sound and a portion of Albemarle Sound	
	Watershed.....	86
2.1	Water Quality Overview	86
2.2	Status and Recommendations for Previously Impaired Waters	89
2.3	Status and Recommendations for Newly Impaired Waters	89
2.4	Impaired Class SA Waters	89
2.5	Other Issues and Recommendations	91
2.5.1	Shallowbag Bay	91
2.5.5	Callaghan Creek.....	92

Chapter 3 – Pasquotank River Subbasin 03-01-52	
Includes Perquimans River, Little River and Tributaries.....	93
3.1 Water Quality Overview	93
3.2 Status and Recommendations for Previously Impaired Waters	95
3.2.1 Little River.....	96
3.2.2 Burnt Mill Creek.....	96
3.3 Status and Recommendations for Newly Impaired Waters	96
3.4 Other Issues and Recommendations	97
3.4.1 Mill Creek.....	97
3.4.2 Bethel Creek	97
3.4.3 Perquimans River.....	98
Chapter 4 – Pasquotank River Subbasin 03-01-53	
Includes Scuppernong River and tributaries and Phelps Lake	99
4.1 Water Quality Overview	99
4.2 Status and Recommendations for Previously Impaired Waters	102
4.2.1 Scuppernong River	102
4.2.2 Kendrick Creek and Main Canal	102
4.3 Status and Recommendations for Newly Impaired Waters	103
4.4 Other Issues and Recommendations	103
4.4.1 Phelps Lake.....	103
Chapter 5 – Pasquotank River Subbasin 03-01-54	
Includes Currituck Sound and the North River.....	105
5.1 Water Quality Overview	105
5.2 Status and Recommendations for Previously Impaired Waters	107
5.3 Status and Recommendations for Newly Impaired Waters	107
5.4 Other Issues and Recommendations	107
5.4.2 Guinea Mill Run	108
5.4.3 Currituck Sound.....	108
Chapter 6 – Pasquotank River Subbasin 03-01-55	
Includes Northeastern Pamlico Sound	109
6.1 Water Quality Overview	109
6.2 Status and Recommendations for Previously Impaired Waters	111
6.3 Status and Recommendations for Newly Impaired Waters	111
6.4 Impaired Class SA Waters	111
6.5 Other Issues and Recommendations	114

6.5.1	Buzzard Bay.....	114
6.5.2	Colington Creek.....	114
6.5.3	Pamlico Sound.....	114
Chapter 7 –	Pasquotank River Subbasin 03-01-56	
	Includes Roanoke Sound and small portions of Albemarle and Currituck	
	Sounds.....	115
7.1	Water Quality Overview	115
7.2	Status and Recommendations for Previously Impaired Waters.....	117
7.3	Status and Recommendations for Newly Impaired Waters	117
7.3.1	Roanoke Sound.....	117
7.4	Impaired Class SA Waters	118
7.5	Other Issues and Recommendations	119

Section C –	Current and Future Water Quality Initiatives.....	120
Chapter 1 –	Current Water Quality Initiatives.....	121
1.1	Workshop Summaries	121
1.2	Federal Initiatives.....	123
1.2.1	Clean Water Act – Section 319 Program.....	123
1.2.2	US Army Corps of Engineers Projects	124
1.2.3	US Fish and Wildlife Service	126
1.3	State Initiatives.....	127
1.3.1	NC Agriculture Cost Share Program	127
1.3.2	Emily and Richardson Preyer-Buckridge Coastal Reserve	128
1.3.3	NC Division of Water Quality and NC Division of Coastal Management Collaboration	129
1.3.4	NC Wetlands Restoration Program	130
1.3.5	Clean Water Management Trust Fund.....	131
1.3.6	Virginia’s Southern Watershed Area Management Program	132
1.3.7	Coastal Nonpoint Pollution Control Program	133
1.3.8	Coastal Habitat Protection Plans	133
1.3.9	North Carolina Sea Grant College Program	134
1.3.10	Albemarle-Pamlico National Estuary Program	135
1.4	Local Initiatives.....	137
1.4.1	NC Cooperative Extension Service	137
1.4.2	Town of Nags Head Septic Health Initiative	137
1.4.3	Dare County Surface Water Quality Monitoring Program.....	139
1.4.4	Keep Pasquotank Beautiful/Recycling; Pasquotank County	139
1.4.5	North Carolina Coastal Federation	140

1.4.6	Citizens' Water Quality Monitoring Program	141
1.4.7	North Carolina Coastal Land Trust.....	142
1.4.8	The Town of Winfall	142
Chapter 2 – Future Water Quality Initiatives.....		144
2.1	Overall DWQ Goals for the Future.....	144
2.2	Coordination with Other Agencies.....	145
2.3	DWQ Compliance and Enforcement Policy Revisions	147
2.4	Non-Discharge Permits	148
2.5	Coordination within DWQ.....	148

APPENDICES

- I NPDES Dischargers and Individual Stormwater Permits in the Pasquotank River Basin
- II Water Quality Data Collected by DWQ
 - Benthic Macroinvertebrate Collections'
 - Fish Community Assessments
- III Use Support Methodology and Use Support Ratings
- IV 303(d) Listing and Reporting Methodology
- V Pasquotank River Basin Workshop Summaries
- VI Pasquotank River Basin Nonpoint Source Program Description and Contacts
- VII Glossary of Terms and Acronyms

LIST OF FIGURES

Figure A-1	Basinwide Planning Schedule (1999 to 2003)	2
Figure A-2	Water Quality Section Organization Structure.....	6
Figure A-3	Division of Water Quality Regional Offices	7
Figure A-4	General Map of the Pasquotank River Basin	9
Figure A-5	Virginia Portion of Chowan and Pasquotank River Basins	10
Figure A-6	Land Cover Changes from 1982 to 1997 for the Pasquotank River Basin	16
Figure A-7	Percentages within Major CGIA Land Cover Categories in the Pasquotank River Basin.....	17
Figure A-8	Public Lands and Significant Natural Heritage Areas in the Pasquotank River Basin.....	21
Figure A-9	Commercial Landing Statistics - Albemarle Sound.....	27
Figure A-10	Commercial Landing Statistics - Pamlico and Roanoke Sounds	27
Figure A-11	NPDES Discharges in the Pasquotank River Basin	30
Figure A-12	Registered Animal Operations in the Pasquotank River Basin.....	32
Figure A-13	Water Supply Watersheds, High Quality Waters and Outstanding Resource Waters in the Pasquotank River Basin	42
Figure A-14	Summary of Compliance with Aquatic Toxicity Tests in the Pasquotank River Basin.....	46
Figure A-15	Use Support Map for the Pasquotank River Basin.....	58
Figure B-1	Pasquotank River Subbasin 03-01-50	82
Figure B-2	Pasquotank River Subbasin 03-01-51	87
Figure B-3	DEH Shellfish Growing Area Classifications in SA Waters of Subbasin 03-01-51	90
Figure B-4	Pasquotank River Subbasin 03-01-52	94
Figure B-5	Pasquotank River Subbasin 03-01-53	100
Figure B-6	Pasquotank River Subbasin 03-01-54	106
Figure B-7	Pasquotank River Subbasin 03-01-55	110
Figure B-8	Northern DEH Shellfish Growing Area Classifications in SA Waters of Subbasin 03-01-55.....	112
Figure B-9	Southern DEH Shellfish Growing Area Classifications in SA Waters of Subbasin 03-01-55.....	113
Figure B-10	Pasquotank River Subbasin 03-01-56	116
Figure B-11	DEH Shellfish Growing Area Classifications in SA Waters of Subbasin 03-01-56	118
Figure C-1	Pasquotank River Basin Water Quality Workshop Participants	121
Figure C-2	Agriculture Cost Share Program Dollars Expended (1995-2000) in Counties in the Pasquotank River Basin	128

LIST OF TABLES

Table 1	Aquatic Life/Secondary Recreation Use Support Summary Information for Waters in the Pasquotank River Basin (2000)	xiii
Table 2	Fish Consumption Use Support Summary Information for Waters in the Pasquotank River Basin (2000).....	xiv
Table 3	Primary Recreation Use Support Summary Information for Waters in the Pasquotank River Basin (2000).....	xv
Table 4	Shellfish Harvest Use Support Summary Information for Waters in the Pasquotank River Basin (1995-2000)	xvi
Table A-1	Schedule for Second Cycle of Basinwide Planning (1998 to 2003)	3
Table A-2	Five-Year Process for Development of an Individual Basinwide Plan.....	3
Table A-3	Local Governments and Planning Units within the Pasquotank River Basin.....	12
Table A-4	Hydrologic Subdivisions in the Pasquotank River Basin	13
Table A-5	Land Cover in the Pasquotank River Basin by Major Watersheds - 1982 vs. 1997.....	14
Table A-6	Description of Land Cover Types	15
Table A-7	Description of Major CGIA Land Cover Categories	16
Table A-8	Pasquotank River Subbasin Population, Densities (1970, 1980 and 1990) and Land Area Summaries	18
Table A-9	Population (1980, 1990, 2000) and Percent Change for Municipalities Located Wholly or Partly in the Pasquotank River Basin.....	19
Table A-10	Past, Projected and Change in Population (1990, 2000, 2020) by County	20
Table A-11	Rare and Threatened Aquatic Species in the Pasquotank River Basin (as of June 2001)	25
Table A-12	Summary of NPDES Dischargers and Permitted Flows for the Pasquotank River Basin.....	29
Table A-13	Registered Animal Operations in the Pasquotank River Basin (as of March 16, 2001).....	34
Table A-14	Estimated Populations of Swine, Dairy and Poultry (1994 and 1998) in the Pasquotank River Basin	34
Table A-15	Water Use and Population for Water Systems in the Pasquotank River Basin.....	36
Table A-16	Registered Water Withdrawals for 1999 in the North Carolina Portion of the Pasquotank River Basin	37
Table A-17	Primary and Supplemental Surface Water Classifications.....	39
Table A-18	Pending Reclassifications in the Pasquotank River Basin	43
Table A-19	Summary of Bioclassifications for All Freshwater Benthic Macroinvertebrate Sites (using the most recent sample for each site) in the Pasquotank River Basin.....	45
Table A-20	Ambient Monitoring System Stations within the Pasquotank River Basin	47
Table A-21	Aquatic Life/Secondary Recreation Use Support Ratings for Monitored, Evaluated and Not Rated Waters Listed by Subbasin in Miles and Acres (1995-2000).....	52

Table A-22	Aquatic Life/Secondary Recreation Use Support Summary Information for Waters in the Pasquotank River Basin (2000)	53
Table A-23	Fish Consumption Use Support Ratings for Monitored Waters Listed by Subbasin (1995-2000)	54
Table A-24	Fish Consumption Use Support Summary Information for Waters in the Pasquotank River Basin (2000).....	54
Table A-25	Primary Recreation Use Support Ratings for Monitored Waters Listed by Subbasin (1995-2000)	55
Table A-26	Primary Recreation Use Support Summary Information for Waters in the Pasquotank River Basin (2000).....	56
Table A-27	Shellfish Harvesting Use Support Ratings for Monitored Waters Listed by Subbasin (1995-2000) in Acres.....	56
Table A-28	Shellfish Harvest Use Support Summary Information for Waters in the Pasquotank River Basin (1995-2000)	57
Table A-29	DEH Shellfish Sanitation Growing Area Classifications.....	60
Table A-30	Permitted Wetland Impacts Activities (in Acres) by Subbasin and Year	73
Table A-31	Permitted Wetland Mitigation Activities (in Acres) by Subbasin and Year	73
Table B-1	DWQ Monitoring Locations and Benthic Macroinvertebrate Bioclassifications (2000) for Pasquotank River Subbasin 03-01-50.....	83
Table B-2	Use Support Ratings Summary (2000) for Monitored and Evaluated Freshwater Streams (Miles) in Pasquotank River Subbasin 03-01-50	83
Table B-3	DWQ Monitoring Locations and Benthic Macroinvertebrate Bioclassifications (2000) for Pasquotank River Subbasin 03-01-51	88
Table B-4	Use Support Ratings Summary (2000) for Monitored and Evaluated Freshwater Streams (Miles) in Pasquotank River Subbasin 03-01-51	88
Table B-5	DWQ Monitoring Locations and Benthic Macroinvertebrate Bioclassifications (2000) for Pasquotank River Subbasin 03-01-52.....	95
Table B-6	Use Support Ratings Summary (2000) for Monitored and Evaluated Freshwater Streams (Miles) in Pasquotank River Subbasin 03-01-52	95
Table B-7	DWQ Monitoring Locations and Benthic Macroinvertebrate Bioclassifications (2000) for Pasquotank River Subbasin 03-01-53.....	101
Table B-8	Use Support Ratings Summary (2000) for Monitored and Evaluated Streams in Pasquotank River Subbasin 03-01-53.....	101
Table B-9	Use Support Ratings Summary (2000) for Monitored and Evaluated Streams (Miles) in Pasquotank River Subbasin 03-01-54	107
Table B-10	Use Support Ratings Summary (2000) for Monitored and Evaluated Freshwater Streams (Miles) in Pasquotank River Subbasin 03-01-55	111
Table B-11	Use Support Ratings Summary (2000) for Monitored and Evaluated Streams (Miles) in Pasquotank River Subbasin 03-01-56	117
Table C-1	Basinwide Concerns Commented by Workshop Participants.....	122
Table C-2	Wetlands Restoration Program Targeted Local Watersheds (2000)	131
Table C-3	Projects in the Pasquotank River Basin Funded by the Clean Water Management Trust Fund (as of April 2001)	132