Table of Contents

Document Overview
Section 1: Stormwater Management Program…… DO-1
Section 2: Sediment Control Program…… DO-1
Section 3: County Road/Property Maintenance and Recycling Activities …… DO-1
Section 4: NPDES Education Program……..…… DO-1
Section 5: Illicit Connections Program…….…….…. DO-2
Section 6: Geographic Information System and Databases…… DO-2
Section 7: Watershed Planning and Restoration…… DO-2
Section 8: Discharge Characterization and Assessment of Controls…….…… DO-2
Section 9: Watershed and Restoration Monitoring…… DO-3
Section 10: BMP Pollutant Load Reduction..……..... DO-3
Section 11: Permit Administration, Legal Authority, and Fiscal Analysis…… DO-3

Section 1: Stormwater Management Program
1.0 Permit Requirements…… 1-1
1.1 Introduction……...…… 1-2
1.2 Plan, and Variance and Fee-in-lieu Reviews…… 1-2
1.2.1 Plan Reviews…….…….. 1-2
1.2.2 Variance and Fee-in-lieu Reviews…….. 1-2
1.3 Approved Stormwater Management Facility Analysis…… 1-3
1.4 Inspections…… 1-7
1.5 Stormwater Management Facility Maintenance…….. 1-8
1.6 Constructed Stormwater Management Facility Data Analysis…… 1-9
1.7 Summary…….. 1-14

Section 2: Erosion and Sediment Control Program
2.0 Permit Requirement…….. 2-1
2.1 Introduction…….. 2-1
2.2 Program Analysis—Plans Review…….…….. 2-2
2.3 Program Analysis—Inspection and Enforcement……..…….. 2-2
2.3.1 Grading and Building Permits Issued…….…. 2-2
2.3.2 Inspections, Complaints and Enforcement……..… 2-5
2.4 Program Analysis—Training Program…….…… 2-8
2.5 Summary……..……. 2-8

Section 3: Road Maintenance and Recycling Activities
3.0 Permit Requirements…… 3-1
3.1 Introduction…….. 3-1
3.2 County Property Management…….. 3-2
3.2.1 County Facility NPDES Permit Compliance……... 3-2
3.3 Storm Drain Cleaning Program……...……. 3-2
3.3.1 Storm Drain Cleaning Overview……..…….……. 3-2
3.3.2 Storm Drain Cleaning Data Analysis……..…….…….. 3-3

3.3.3 Storm Drain Data by Watershed……..…….…….. 3-6
3.3.4 Program Summary – Storm Drain Cleaning…….……... 3-8
3.4 Street Sweeping……...……..…….. 3-8
3.4.1 Street Sweeping Overview…….……. 3-8
3.4.2 Street Sweeping by Watershed……..…….. 3-10
3.4.3 Program Summary – Street Sweeping…….…… 3-12
3.5 Household Hazardous Waste (HHW)…….…….……. 3-12
3.6 Fertilizer, Pesticide, and Deicing Statistics…….. 3-15

Section 4: NPDES Education Program
4.0 Permit Requirements…… 4-1
4.1 Introduction…….…. 4-1
4.2 Program Description……... 4-3
4.2.1 Baltimore County DEPRM's Environmental Education Programs.
4.2.1.1 School Initiatives……. 4-3
4.2.1.2 Outreach to Homeowners, Citizen Groups, Businesses, and Landscape Managers……... 4-11
4.2.2 Program Use…….. 4-13
4.2.3 Program Accomplishments…….. 4-15
4.2.4 Secchi Disk Monitoring Program……. 4-22
4.2.5 The Stream Watch Program…….. 4-22
4.2.6 Watershed Association Restoration Planning and Implementation Grant Program……..……. 4-22
4.2.7 The Baltimore Watershed Agreement……...…… 4-23
4.2.8 Tree-Mendous Maryland Program in Baltimore County…….. 4-23
4.2.9 The Baltimore County Forest Conservatory District Board…….. 4-23
4.2.10 The Baltimore County Growing Home Campaign……...…… 4-25
4.2.11 Additional Educational Efforts…….. 4-26
4.3 Summary……..……. 4-26

Section 5: Illicit Connection Program
5.0 Permit Requirements…… 5-1
5.1 Introduction…….. 5-1
5.2 Program Status…….. 5-2
5.3 Analysis of Outfall Screenings……. 5-2
5.4 Illicit Connections Investigations and Corrections……... 5-7
5.5 Regional Illicit Connections Investigations and Complaint Database……. 5-12
5.6 Summary…….…….… 5-13

Section 6: Geographic Information System and Databases
6.0 Permit Requirements…… 6-1
6.1 Source Identification-Geographic Information System Data layers…… 6-2
6.1.1 Storm Drain System…… 6-2
6.1.2 Urban Best Management Practices…… 6-2
6.1.3 Impervious Surfaces…… 6-2
6.1.4 Monitoring Locations…… 6-3
6.1.5 Watershed Restoration…… 6-3
6.2 Databases…… 6-3
6.2.1 Chemical Data…… 6-3
6.2.2 Biological Data…… 6-3
6.2.3 Geomorphological Data…… 6-3
6.2.4 Illicit Discharge Detection and Elimination…… 6-4
6.2.5 Responsible Personnel Certificate Information…… 6-4
6.2.6 Grading Permit Information…… 6-4

Section 7: Watershed Planning and Restoration
7.0 Permit Requirements…… 7-1
7.1 Introduction…… 7-2
7.2 Status of Watershed Management Plans…… 7-3
7.2.1 Water Quality Management Plans…… 7-3
7.2.2 Small Watershed Action Plans (SWAPs)…… 7-4
7.3 Obtaining Pollution Reduction Numbers…… 7-5
7.3.1 Stream Restorations…… 7-5
7.3.2 Shoreline Enhancement Projects…… 7-5
7.3.3 Stormwater Retrofits…… 7-5
7.3.4 Community Reforestation Program…… 7-6
7.3.5 Activities of Volunteer Organizations…… 7-6
7.4 Capital Restoration Projects - Upper Western Shore Watersheds…… 7-7
7.4.1 Deer Creek…… 7-7
7.4.2 Prettyboy Reservoir…… 7-7
7.4.3 Loch Raven Reservoir Watershed…… 7-9
7.4.4 Lower Gunpowder Falls Watershed…… 7-11
7.4.5 Little Gunpowder Falls Watershed…… 7-12
7.4.6 Bird River Watershed…… 7-13
7.4.7 Gunpowder River Watershed…… 7-14
7.4.8 Middle River Watershed…… 7-15

7.5 Capital Restoration Projects - Patapsco/Back River Watersheds……. 7-16
7.5.1 Liberty Reservoir Watershed……... 7-16
7.5.2 Patapsco River Watershed……... 7-17
7.5.3 Gwynns Falls Watershed……. 7-18
7.5.4 Jones Falls Watershed……. 7-20
7.5.5 Back River Watershed……. 7-22
7.5.6 Baltimore Harbor Watershed……... 7-23
7.6 Community Reforestation Program…….. 7-24
7.7 Volunteer Organizations……. 7-26
7.8 Additional Restoration Efforts…….. 7-27
7.8.1 Growing Home Campaign……... 7-27
7.8.2 Tree-Mendous Maryland Program in Baltimore County…… 7-27
7.9 Pollution Reduction Tracking Database……... 7-28
7.10 Impervious Surface Calculation……... 7-29

Section 8: Discharge Characteristics and Assessment of Controls
8.0 Permit Requirements…… 8-1
8.1 Introduction……..…..…… 8-3
8.2 Scotts Level Branch Long-Term Monitoring……... 8-3
8.2.1 Monitoring Design…….…….…….. 8-5
8.2.1.1 Flow Monitoring…….… 8-5
8.2.1.2 Chemical Monitoring…….. 8-6
8.2.1.3 Geomorphological Monitoring……... 8-7
8.2.1.4 Biological Monitoring…… 8-9
8.3 Scotts Level Branch Long-Term Site Monitoring Results….…….…. 8-9
8.3.1 Flow Monitoring……..……. 8-9
8.3.2 Chemical Monitoring…… 8-12
8.3.2.1 Storm Event Monitoring Results…….…... 8-12
8.3.2.2 Baseflow Monitoring Results……. 8-35
8.3.2.3 Pollutant Load Calculations…… 8-36
8.3.3 Geomorphological Monitoring……. 8-32
8.3.4 Biological Monitoring Results…….. 8-44
8.4 Windlass Run Monitoring – Stormwater Assessment…….. 8-47
8.4.1 Stream Geomorphologic Assessment……...…… 8-48
8.4.2 Biological Monitoring…….. 8-59

Section 9: Watershed and Restoration Monitoring
9.0 Permit Requirements……..…….. 9-1
9.1 Introduction…….…….…… 9-1
9.2 Chemical Monitoring Program……...….. 9-2
9.2.1 Baseflow Monitoring…….. 9-2
9.2.2 Tidal Waters Monitoring Program……..…….…….. 9-12
9.3 Stream Geomorphological Monitoring……. 9-18
9.3.1 Stream Restoration Project Monitoring…….. 9-18
9.3.2 Stream Stability Assessments……. 9-19
9.3.3 Geomorphological Monitoring Summary…….. 9-20

9.4 Biological Monitoring…….. 9-20
9.4.1 Probabilistic Monitoring…….……... 9-20
9.4.2 Capital Improvements Projects Monitoring…….…….. 9-29
9.4.3 Reference Site Monitoring…….……. 9-34
9.4.4 Submerged Aquatic Vegetation Monitoring Program…….……... 9-37
9.5 Status of Brook Trout in the Prettyboy Reservoir Watershed…….. 9-40
9.5.1 Introduction…… 9-40
9.5.2 Methods…….. 9-40
9.5.3 Results and Discussion……... 9-41
9.5.4 References…….. 9-43
9.6 Stream Corridor Assessment…… 9-53
9.6.1 Introduction……... 9-53
9.6.2 Summary of Results……... 9-55
9.6.3 Summary of Erosion…….. 9-58
9.6.4 Summary of Trash Dumping……. 9-61
9.6.5 Summary of Inadequate Buffer……. 9-63
9.6.6 Summary of Unusual Conditions and Comments……. 9-65
9.6.7 Summary of Fish Barrier……... 9-67
9.6.8 Summary of Pipe Outfall……... 9-69
9.6.9 Summary of In or Near Stream Construction…… 9-71
9.6.10 Summary of Representative Sites…….. 9-73
9.6.11 Discussion…….. 9-75

Section 10: BMP Pollutant Load Reductions
10.0 Permit Requirements……..……. 10-1
10.1 Introduction…….…… 10-1
10.2 Pollutant Load Calculations……...……...……. 10-2
10.3 New Nutrient Reduction and Impervious Cover Addressed Tracking Added This Year….…….…… 10-5
10.4 Summary of Pollutant Reduction Programs…… 10-5
10.5 Progress in Meeting MS4 Impervious Restoration, TMDLs, and Maryland Tributary Strategies….…….…... 10-9
10.5.1 MS4 Impervious Restoration…….. 10-9
10.5.2 TMDL Progress……... 10-10
10.5.3 Maryland Tributary Strategies……. 10-11
10.6 Summary……... 10-12

Section 11: Permit Administration, Legal Authority, and Fiscal Analysis
11.0 Permit Requirements…...……... 11-1
11.1 Permit Administration……...…….. 11-1
11.2 Legal Authority……..…….……. 11-3
11.3 Fiscal Analysis……...…….. 11-3

List of Tables

1-1 Fee-in-lieu money received in 2008…… 1-3
1-2 Approved Stormwater Management Facilities by Watershed Through 2008……..…… 1-4
1-3 SWM Inspections 2008 …… 1-7
1-4 Stormwater Facility Maintenance Visits by Type 2008…… 1-8
1-5 SWM Pond Maintenance Activities for Calendar Year 2008……... 1-9
1-6 Constructed SWM Facility Drainage Area Land Use (Acres) by Watershed through Calendar Year 2008…….. 1-10
1-7 Pollutant Loads to Constructed SWM Facilities by Watershed…… 1-10
1-8 Percent Removal Efficiency of BMPs…….…… 1-11
1-9 Total Phosphorus Removal by SWM Facility Type and Watershed…… 1-12
1-10 Total Nitrogen Removal by SWM Facility Type and Watershed……. 1-12
1-11 Impervious Cover Addressed by All SWM and Advanced SWM…….…… 1-13

2-1 Number of Grading Permits and Acreage of Disturbance by Watershed.… 2-3
2-2 Number of Building Permits by Watershed Approved in 2008…… 2-4
2-3 Number of Grading and Building Permits by Year……..…… 2-5
2-4 Sediment Control Inspection Data for 2008..…… 2-7

3-1 NPDES Permit Compliance Status……... 3-2
3-2 Removal Rates of Vac-Con Inlet and Pipe Cleaning by Year…….…. 3-3
3-3 2008 Material Removed in Cubic Yards by Watershed…… 3-6
3-4 2008 Storm Drain Cleaning Program Pollutant Removal (Pounds) and Impervious Urban Acres Treated …… 3-8
3-5 Annual Street Sweeping Summary.……..…… 3-9
3-6 2008 Street Sweeping Program – Tons Removed from Watersheds…… 3-11
3-7 2008 Street Sweeping Program Pollutant Removal (Pounds) and Impervious Urban Acres Treated ……..…... 3-11
3-8 Household Hazardous Waste Recycled (2003-2008)……... 3-12
3-9 2008 County Agency Fertilizer, Pesticide, and Deicing Materials Used (in Pounds)…….. 3-16
3-10 Annual Fertilizer, Pesticide and Deicing Materials Used By County Agencies (in Pounds)…… 3-16

4-1 School and Community Environmental Education Projects Implemented in County watersheds by Baltimore County's Newly Recognized Public and Private MD Green Schools and Green Centers, 2008…….. 4-6
4-2 School and Community Environmental Education Projects Implemented in County watersheds by Baltimore County's Re-certifying Public and Private MD Green Schools, 2008…….. 4-7
4-3 Education Events Conducted for Residents of the County and Region by Watershed Audience, 2008……... 4-14
4-4 Education Events by Type of Audience*, 2008……..…….. 4-14
4-5 *Maryland Green Schools* by Jurisdiction 1999-2008…….……... 4-16
4-6 Number of Participants in MD Green School Program in Baltimore County, 2008……. 4-16
4-7 Community and Business Partnerships Supporting Baltimore County's Public Schools recognized as MD Green Schools, 2008…….……. 4-21
4-8 Presentations, Participants, and Materials, 1994-2008……. 4-21

5-1 Major Outfalls by Watershed and Priority Classification…….…… 5-3
5-2 Complaints Processed from January 1, 2008 through December 31, 2008.. 5-7

7-1 Status of Watershed Management Plans…….. 7-3
7-2 Watershed Management Plans Consultants and Costs…….. 7-4
7-3 Percent Removal Efficiency of BMPs……..…… 7-6
7-4 Prettyboy Reservoir Watershed – CIP Status……...……. 7-8
7-5 Loch Raven Reservoir Watershed – CIP Status……...……. 7-10
7-6 Lower Gunpowder Falls Watershed – CIP Status ……...……. 7-11
7-7 Little Gunpowder Falls Watershed – CIP Status ……...…….. 7-13
7-8 Bird River Watershed – CIP Status……... 7-14
7-9 Gunpowder River Watershed – CIP Status……... 7-15
7-10 Middle River Watershed – CIP Status…….. 7-15
7-11 Patapsco River Watershed – CIP Status…… 7-18
7-12 Gwynns Falls Watershed – CIP Status…….. 7-19
7-13 Jones Falls Watershed – CIP Status…….. 7-20
7-14 Back River Watershed – CIP Status…….. 7-23
7-15 Baltimore Harbor Watershed – CIP Status……... 7-24
7-16 Baltimore County Reforestation Projects by Calendar Year…… 7-25
7-17 Baltimore County Reforestation Projects by Watershed through 2008…… 7-26
7-18 Watershed Groups' Projects Resulting in Nutrient Reductions…… 7-26
7-19 Number of Trees Planted in the Upper Western Shore Basin……... 7-27
7-20 Number of Trees Planted in the Patapsco/Back River Basin…… 7-27
7-21 Baltimore County Impervious Area by Watershed – Changes Between 1997 and 2005……... 7-29

7-22 Baltimore County and Maryland State Highway Impervious Acreage……. 7-30
7-23 Impervious Acreage Addressed by Completed Capital Projects and Advanced Treatment SWM Facilities…….…….. 7-31
7-24 County Impervious Cover Addressed by the Current SWAPs……..... 7-31

8-1 Scotts Level Branch, Powder Mill Run, and Upper Gwynns Falls Information ……..……. 8-5
8-2 USGS Gage Information……...…… 8-5
8-3 Precipitation Data Analysis for Calendar 2008……...…….. 8-10
8-4 2008 Precipitation Amount, Intensity, and Duration by Category …….. 8-10
8-5 Seasonal Precipitation and Runoff Characteristics……..……. 8-12
8-6 Regression Equations Relationship Between Discharge (CFS) and Pollutant Concentrations……... 8-12
8-7 2008 Daily Baseflow Pollutant Loads for Scott's Level Branch Sites …… 8-35
8-8 Pollutant Load Characteristics for USGS gaged site (SL-01) Calendar Year 2008…….…. 8-37
8-9 Scotts Level Branch Cross Sections - Cut and Fill Amounts……... 8-39
8-10 Scotts Level Branch Stream Channel Changes Over Time……... 8-41
8-11 Pollutant Load Estimates- Comparison between Water Quality Monitoring and Geomorphology for Scotts Level Branch, 2006 - 2008….. 8-42
8-12 Powder Mill Run Cross Sections - Cut and Fill Amounts……... 8-43
8-13 Powder Mill Run, 2007-2008 and 2005-2008 Stream Channel Changes…. 8-43
8-14 Windlass Run Cross Sections - Cut and Fill Amounts……. 8-58
8-15 Windlass Run Stream Channel Changes Over Time…… 8-58

9-1 Baseflow Pollutant ANOVA and Duncan's Multiple Range Test Results... 9-5
9-2 Site Codes and the Associated Tidal Water body……. 9-14
9-3 ANOVA and Duncan's Multiple Range Test Results……... 9-14
9-4 Summary of Capital Improvements Projects Monitoring Reports Submitted for 2008…… 9-19
9-5 BIBI Metrics…….. 9-21
9-6 BIBI Score Distribution by Watershed (% by Category)…….. 9-24
9-7 Watershed Biological Condition Using Percent Stream Mile Method..…... 9-26
9-8 Watershed Biological Condition Using Average IBI Method…….. 9-27
9-9 Stream Restoration Biological Monitoring Site Locations….…….. 9-29
9-10 Taxonomic composition of MNBK-1, 2008……..……... 9-31
9-11 Benthic and fish taxa collected at WDVL-1 and WDVL-3, 2008.……... 9-33
9-12 Reference Site Locations…….…….……. 9-34
9-13 SAV Standards and Baltimore County SAV Monitoring Results (2006-2008)……..…….……... 9-38
9-14 Prettyboy Reservoir brook trout and thermal monitoring stations.……... 9-43
9-15 Prettyboy Reservoir brook trout population data.……. 9-44
9-16 Fish Index of Biotic Integrity (FIBI) and Physical Habitat Index (PHI) Scores ……... 9-45
9-17 Water Temperature Summary….…….. 9-45
9-18 Fish Community Composition……..…… 9-46

9-19	Land Use by Percentage……	9-47
9-20	Brook Trout Redd Counts…….	9-47
9-21	Total Stream Miles and Stream Miles Surveyed, by Subwatershed…….	9-57
9-22	Summary of Results From Prettyboy Direct Drainage 3 Subwatershed…...	9-57
9-23	Summary of results from Prettyboy Direct Drainage 4 Subwatershed…….	9-57
9-24	Listing of Information by Site……...	9-75
9-25	Listing of Sites by Problem Category……...	9-78
10-1	Status of TMDLs and TMDL Reduction Requirements for Urban Stormwater……	10-1
10-2	Nitrogen Per Acre Pollutant Rate, MDE Segment and CBP Segment ….....	10-3
10-3	Phosphorus Per Acre Pollutant Rate, MDE Segment and CBP Segment …	10-4
10-4	Watershed Nitrogen Loads (%)…..……	10-4
10-5	Watershed Phosphorous Loads (%)……..……...	10-5
10-6	Pollutant Removal (Pounds) by Upper Western Shore Watersheds Attributed to BMP's……..	10-6
10-7	Pollutant Removal (Pounds) by Patapsco/Back River Watersheds Attributed to BMPs…….…..	10-8
10-8	Impervious Cover Addressed by Water Quality Improvement Efforts to Date……...	10-10
10-9	Progress in Meeting Nutrient TMDLs Where Developed……	10-10
10-10	Upper Western Shore Urban Tributary Strategy……...	10-12
10-11	Patapsco/Back River Urban Tributary Strategy……	10-12
10-12	Tributary Strategy Urban Non-point Nutrient Load Reduction Process…...	10-12
11-1	Major NPDES Program Tasks and Responsible Baltimore County Agencies……	11-2
11-2	NPDES Operating Budget…….	11-3
11-3	Capital Budget and Program…….	11-3
11-4	Baltimore County Environmental Capital Improvement Program- Fiscal Year 2008 & 2009…...……..	11-4
11-5	Baltimore County Environmental Capital Improvement Program- Fiscal Year 2010 & 2011...……..	11-4
11-6	Baltimore County Environmental Capital Improvement Program- Fiscal Years 2012 & 2013……...……	11-5

List of Figures

1-1	Number of Approved SWM Facilities by Watershed— Through Calendar Year 2008…….	1-6
1-2	Acreage Served by Approved Private SWM Facilities by Watershed Through Calendar Year 2008….…….	1-6
1-3	Acreage Served by Approved Public SWM Facilities by Watershed Through Calendar Year 2008….……	1-7
2-1	Acres of disturbance through approved grading permits by watershed for 2008…….	2-3
2-2	Number of building permits issued in 2008 by watershed……	2-4
2-3	Approved Grading and Building Permits for the Period 1998 – 2008……	2-5
2-4	The number of sediment control enforcement actions by month for the calendar year 2008…….	2-6
2-5	Number of sediment control inspections and the total number of inspections by month for the calendar year 2008……	2-7
3-1	Summary Report for Inlets…….…….	3-4
3-2	Annual Inlet Debris Removal Rates……	3-4
3-3	Summary Report for Pipes…….……..	3-5
3-4	Annual Pipe Debris Removal Rates……...……..	3-5
3-5	Miles of Street Swept, Tons of Material Removed and Tons/Miles Swept	3-10
3-6	Household Hazardous Wastes Recycling of Flammables, Gasoline, and Pesticides…….……	3-14
3-7	Waste Oil and Anti-freeze Recycled from 1991 through 2008……...	3-15
3-8	Trends in Annual Fertilizer and Pesticide Used by County Agencies…….	3-17
3-9	Trends in Annual Deicing Material Used by County Agencies……..	3-17
5-1	Major Outfall Prioritization…….	5-4
5-2	Major Outfall Screening Priority Distribution……...…….	5-5
5-3	Number of *quantitative* problems detected…….	5-6
5-4	Number of *qualitative* problems visually observed...……..	5-7
5-5	Involvement of the Regional Programs in the Investigation of Illicit Connections…….	5-12
7-1	Number of trees obtained through the Tree-Mendous Maryland Program with technical assistance and free tree delivery by DEPRM between 1990 and 2008……...	7-28

8-1	Subwatersheds to be used in the Paired Watershed Monitoring Design.…	8-4
8-2	Scotts Level Branch Chemical Monitoring Locations.……	8-6
8-3	Scotts Level Branch Geomorphological and Biological Monitoring Site Locations……..	8-8
8-4	Powder Mill Run Geomorphological and Biological Monitoring Sites…..	8-9
8-5	Calendar year 2008 Daily Precipitation and Discharge……...	8-11
8-6	Total Suspended Solids (TSS) Data and Regressions for 2005-2009…….	8-13
8-7	Total Kjeldahl Nitrogen (TKN) Data and Regressions for 2005-2009…...	8-14
8-8	Nitrate/Nitrite (NO_2/NO_3) Data and Regressions for 2005-2009……	8-14
8-9	Total Nitrogen (TN) Data and Regressions for 2005-2009…….	8-15
8-10	Total Phosphorus (TP) Data and Regressions for 2005-2009…….	8-15
8-11	Total Copper (Cu) Data and Regressions for 2005-2009……	8-16
8-12	Total Lead (Pb) Data and Regressions for 2005-2009……	8-16
8-13	Total Zinc (Zn) Data and Regressions for 2005-2009……	8-17
8-14	Chloride (Cl) Data and Regressions for 2005-2009……	8-17
8-15	Sodium (Na) Data and Regressions for 2005-2009…….	8-18
8-16a	Event Mean Concentration for Total Suspended Solids (TSS) 2005-2006.	8-19
8-16b	Event Mean Concentration for Total Suspended Solids (TSS) 2007-2008.	8-19
8-16c	Event Mean Concentration for Total Suspended Solids (TSS) 2009……..	8-20
8-17a	Event Mean Concentration for Total Kjeldahl Nitrogen (TKN) 2005-2006…….	8-20
8-17b	Event Mean Concentration for Total Kjeldahl Nitrogen (TKN) 2007-2008…….	8-21
8-17c	Event Mean Concentration for Total Kjeldahl Nitrogen (TKN) 2009……	8-21
8-18a	Event Mean Concentration for Nitrate/Nitrite (NO_2/NO_3) 2005-2006……	8-22
8-18b	Event Mean Concentration for Nitrate/Nitrite (NO_2/NO_3) 2007-2008……	8-22
8-18c	Event Mean Concentration for Nitrate/Nitrite (NO_2/NO_3) 2009…….	8-23
8-19a	Event Mean Concentration for Total Nitrogen (TN) 2005-2006…….	8-23
8-19b	Event Mean Concentration for Total Nitrogen (TN) 2007-2008…….	8-24
8-19c	Event Mean Concentration for Total Nitrogen (TN) 2009……..	8-24
8-20a	Event Mean Concentration for Total Phosphorus (TP) 2005-2006…….	8-25
8-20b	Event Mean Concentration for Total Phosphorus (TP) 2007-2008…….	8-25
8-20c	Event Mean Concentration for Total Phosphorus (TP) 2009……..	8-26
8-21a	Event Mean Concentration for Total Copper 2005-2006……	8-26
8-21b	Event Mean Concentration for Total Copper 2007-2008……	8-27
8-21c	Event Mean Concentration for Total Copper 2009…….	8-27
8-22a	Event Mean Concentration for Total Lead 2005-2006……	8-28
8-22b	Event Mean Concentration for Total Lead 2007-2008……	8-28
8-22c	Event Mean Concentration for Total Lead 2009…….	8-29
8-23a	Event Mean Concentration for Total Zinc 2005-2006…….	8-29
8-23b	Event Mean Concentration for Total Zinc 2007-2008…….	8-30
8-23c	Event Mean Concentration for Total Zinc 2009……..	8-30
8-24a	Event Mean Concentration for Chloride 2005-2006……...	8-31
8-24b	Event Mean Concentration for Chloride 2007-2008……...	8-31
8-24c	Event Mean Concentration for Chloride 2009…….	8-32
8-25a	Event Mean Concentration for Sodium 2005-2006…….	8-32
8-25b	Event Mean Concentration for Sodium 2007-2008…….	8-33

8-25c	Event Mean Concentration for Sodium 2009……..	8-33
8-26	Concentration over Time for TSS, TP, TKN, NO2/NO3, Total Copper during storm event on 11/13/08……...	8-35
8-27	Scotts Level Branch Geomorphological Cross Section 1 Overlay showing net deposition especially on the right channel side between the 2007 and 2008 surveys.……..…….	8-39
8-28	(a) Scotts Level Branch and (b) Powder Mill Run IBI Scores ……...	8-45
8-29	(a) Scotts Level Branch and (b) Powder Mill Run PHI Scores …….….	8-46
8-30	Windlass Run Aerial Photograph Showing Monitoring Station Locations.	8-49
8-31	Orthophotograph of Windlass Run watershed, 1995.……..	8-51
8-32	Windlass Run watershed orthophotograph, 2002.……..……	8-52
8-33	Windlass Run orthophotograph, 2005…….	8-53
8-34	Windlass Run orthophotograph, 2007…….	8-54
8-35	Summary of cross-sectional changes in Windlass Run during entire study period……..	8-57
8-36	Windlass Run BIBI Scores…….	8-60
8-37	Windlass Run Physical Habitat Scores……	8-61
9-1	Patapsco/Back River Basin – Baseflow Monitoring Sites……...	9-3
9-2	Gunpowder Basin/Deer Creek – Baseflow Monitoring Sites……..	9-4
9-3	Frequency distributions by concentration for Total Copper and Dissolved Copper for the 2008 Patapsco/Back River Basin samples…….….	9-5
9-4	Duncan's Multiple Range Test results for COD, TN, Dissolved Copper, and Chlorides.…….…….……	9-7
9-5	Baseflow Dissolved Copper, Nitrate/Nitrite, Chloride, and Total Phosphorus for sampling years 2004, 2006, and 2008……	9-7
9-6	Baseflow Total Nitrogen Mean Concentrations for Monitoring Years 2007 (Patapsco/Back River Basin) and 2008 (Gunpowder Basin)..……	9-10
9-7	Baseflow Total Phosphorus Mean Concentrations for Monitoring Years 2007 (Patapsco/Back River Basin) and 2008 (Gunpowder Basin)……..	9-11
9-8	Tidal Waters Monitoring Site Locations…….	9-13
9-9	Pollutant Between Year Variation by Site……...	9-16
9-10	Probabilistic Biological Monitoring results for 2005 and 2006……..	9-22
9-11	Probabilistic Biological Monitoring results for 2007 and 2008……..	9-23
9-12	Means and one standard deviation of BIBI scores for Patapsco/Back River watersheds between 2003 and 2007…….…..	9-25
9-13	Means and one standard deviation of BIBI scores of Gunpowder Falls/Deer Creek watersheds between 2004 and 2008……...…….	9-25
9-14	Mean BIBI scores for (a) Patapsco/Back River and (b) Gunpowder/Deer Creek Sentinel Sites between 2003 and 2008……..……...	9-28
9-15	Minebank Run Biological Monitoring Stations.……..……	9-30
9-16	Biological index values at MNBK-1 from beginning of monitoring to present.……..……...	9-31
9-17	Woodvalley Biological Monitoring Station Locations.……...	9-32
9-18	Benthic and Fish IBI and Physical Habitat Index Values for (a) WDVL-1 (restored) and (b) WDVL-3 (control)……..	9-32
9-19	Box and Whisker Plot of Reference Site BIBI Values by Year……..	9-35

9-20	Box and Whisker Plot of Reference Site BIBI Values by Year……...	9-35
9-21	Mean and One Standard Deviation of PHI Scores for Reference Stations Since 2005..…….	9-36
9-22	BIBI and PHI values for WDVL-1 and Reference Sites……..	9-37
9-23	Baltimore County SAV Monitoring Program – Trends in % Coverage...	9-39
9-24	Locations of Prettyboy Reservoir Watershed Monitoring Sites……..…..	9-48
9-25	Maximum Air and Water Temperatures at Prettyboy Stations…….	9-49
9-26	Map of Prettyboy Subwatersheds…….	9-54
9-27	Map of the Streams Surveyed for the Two Subwatersheds……..	9-56
9-28	Potential Stream Problems by Subwatershed……...	9-58
9-29	Severity Distribution of Sites……	9-59
9-30	Map of Erosion Severity and Location…….	9-60
9-31	Severity Distribution of Sites……	9-61
9-32	Map of Trash Dumping Severity and Location……	9-62
9-33	Severity Distribution of Sites……	9-63
9-34	Map of Inadequate Buffer Severity and Location……	9-64
9-35	Severity Distribution of Sites……	9-65
9-36	Map of Unusual Condition/Comment Severity and Location……..	9-66
9-37	Severity Distribution of Sites……	9-67
9-38	Map of Fish Barrier Severity and Location……..……	9-68
9-39	Severity Distribution of Sites……	9-69
9-40	Map of Pipe Outfall Severity and Location……..……	9-70
9-41	Severity Distribution of Sites……	9-71
9-42	Map of In or Near Stream Construction Severity and Location……...	9-72
9-43	Map of Representative Site Locations……..	9-74

List of Exhibits

4-1 Baltimore County's *Maryland Green Schools and Green Centers*, 1999-2008……..…….. 4-28

11-1 Department of Environmental Protection and Resource Management Table of Organization for FY2009……. 11-5

11-2 Department of Environmental Protection and Resource Management Staff Organizational Chart Effective April 25, 2009……...…….. 11-8

List of Appendices

1-1 Public Stormwater Facility Maintenance by Type for Calendar Year 2008……..…… 1-15

2-1 List of Individuals Receiving Certification…… 2-9

4-1 Presentations, Distributions, and Events, by Watershed, 2008……..…… 4-29

4-2 Education Program: Recycling Presentations, 2008 Accomplished by Baltimore County Department of Public Works, Recycling Division…….. 4-37

9-1 Baseflow Monitoring Sites by Watershed.……...…… 9-83

9-2 Baseflow Water Quality Data by Site……...…… 9-84

9-3 Tidal Waters Chemical Monitoring Results…….…… 9-97

9-4 Results of 2008 Probabilistic Monitoring……...…….. 9-100