

APPENDIX

NOVEMBER 2009

# water resources

FUNCTIONAL PLAN



MONTGOMERY COUNTY PLANNING DEPARTMENT  
THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

[MontgomeryPlanning.org](http://MontgomeryPlanning.org)

## Introduction

Appendices 1 through 4 contain selected excerpts, maps, and tables from the *Ten-Year Comprehensive Water Supply and Sewerage Systems Plan* (Water and Sewer Plan), with some additional water supply and wastewater information. The selected material presents water and sewer planning background information, and data pertaining to water and sewer capacities as the County continues to grow. The Water and Sewer Plan is the County's principal means for addressing all water and wastewater planning, policy, and technical issues, and documents ongoing efforts in Montgomery County to ensure a continued safe and adequate water supply and wastewater treatment.

The entire Water and Sewer Plan is available online at: [www.montgomerycountymd.gov/waterworks](http://www.montgomerycountymd.gov/waterworks)

Appendices 5 and 6 contain WSSC information on water supply production and wastewater flow projections. Appendix 7 contains information pertaining to Agricultural Land protection and preservation in Montgomery County. Appendix 8 documents M-NCPPC's Nutrient Loading Analysis of existing land cover conditions and of two 2030 land cover scenarios. Appendix 9 summarizes the interagency coordination and public outreach that was undertaken during plan development.

## Appendix 1

Information on WSSC Programs and Initiatives, and Excerpts, Selected Maps, and Tables from Chapter 1 of the Water and Sewer Plan

## Appendix 4

Information on Sewerage Systems Issues, and Excerpts, Selected Maps, and Tables from Chapter 4 of the Water and Sewer Plan



adequately demonstrating to the County that the proposed facilities will not have a significant, detrimental impact on the surrounding community or receiving waters.

Proposed modifications to existing treatment facilities, including both system upgrading and expansion, are also subject to the County's approval. This includes any proposed community multi-use or individual system treatment facility or discharge point modification which requires a State construction and/or discharge permit. Any modifications requiring MDE's review and approval shall also require prior incorporation of the proposed modification in this Plan, as either a text amendment or as an adopted ~~capitaleapitel~~ improvement program (CIP) project. Specific proposals for new or modified facilities shall be submitted to the Director of DEP with supporting documentation as required by the Director.

The State of Maryland, as part of its efforts to improve the ecological health of the Chesapeake Bay, is investigating the impact of lowering the wastewater treatment plant nitrogen discharge standard from 8 milligrams per liter (mg/l) to 3 mg/l. This new standard would affect all of the wastewater treatment plants serving Montgomery County, and would have significant financial implications for WSSC and WASA with regard to the facility upgrades and treatment process improvements needed to comply with the lowered standard.

**4.II.11 Financing Sewerage Systems** WSSC uses several methods to fund the construction and operation of the sewerage system. Detailed information concerning WSSC's funding methods is included in Chapter 1, Section IV.A.

**4.II.11.C Existing and Planned Sewerage Systems and Projected Needs** The sewage collection and conveyance system within the WSSD consists of over 4,000 miles of gravity and force mains ranging from 6 to 102 inches in diameter and 52 wastewater pumping stations, including 26 stations in Montgomery County. This section presents an overview of the County's long-term sewerage system needs and anticipated constraints within each service area and individual sewershed. The anticipated sewerage system needs and constraints discussed in this section focus on the major components of WSSC's transmission and treatment facilities. The information presented here is based on the results of various studies as referenced at the end of this chapter.

The planned projects programmed in the WSSC CIP are intended to address the county's current and/or short-term wastewater conveyance or treatment needs. The CIP projects include funding and schedules for planning, design, land acquisition, and construction of facilities. These facilities often support new development in accordance with the County's approved plans and policies for orderly growth and development. Other projects are for system improvements and/or for compliance with environmental regulations and policies.

Flow projections within the WSSD are based on the County's adopted plans and approved service areas for future growth, and are in accordance with the County's latest master plans for development. M-NCPPC provided the population and growth estimates used in WSSC's studies. WSSC has developed flow projections to determine the approximate time a planning decision for each facility should be made. Wastewater flow forecasts are developed from detailed analyses of existing flow records and projected additional future flow based on projected demographics, wastewater flow per household and per employment, and other factors such as infiltration (extraneous groundwater) and inflow. Population forecasting and flow projection are

For more detailed information on wastewater treatment systems, see Chapter 4 of the Water and Sewer Plan.

## Appendix 5 WSSC Approved Water Supply Projections

This Appendix contains the latest WSSC water production projections and provides background information on how the projections were developed. In subsequent planning efforts, these water production projections will be used to analyze the adequacy of the existing water system to meet future needs and to determine the timing and sizing of needed improvements.

	Single Family	Multi Family	Employment
For units existing as of 2005	218	194	56
For units added after 2005	228	181	56

Table 1. Recommend Per-Unit Production Factors (in gpd).

### Growth and Average Production Forecasts

Round 7.0 Growth Forecasts have been provided by the M-NCPPC for both Prince George’s and Montgomery counties. This data includes single family and multifamily households, employees and population in 5 year increments through 2030. (Although population data is not used in the calculation of projected water production, it is often useful data with regard to the water system).

The demographic data is provided by geographic units called COG Analysis Zones (CAZs). In general, these geographic units have no relationship to the water system boundaries, so the demographic data must be allocated to water system pressure zones. In past analysis, the allocation process involved tedious and time consuming manual calculations. Today, WSSC’s Geographical Information System (GIS) automates this process and vastly increases the speed at which these allocations are made.

Table 2 shows the number of units allocated to the WSSC water pressure zones, as used for water production projections, and population. For each 5 year increment, the table shows units for each county and the total. Based on these numbers and overall population projections, as of 2005, WSSC served 90% of the Montgomery County population, 95% of the Prince George’s County population and 93% of the bi-county population.

[Note: When these WSSC water production projections were prepared, Round 7.0 was the latest information available. When the water production projections are revised, the most current MWCOG Round data will be used.]



## Appendix 6

### WSSC Adopted Wastewater Flow Projections

This Appendix contains the wastewater flow projections to 2030 for the wastewater treatment plants serving the Sanitary District, prepared by the Wastewater Planning Unit of WSSC's Planning Group.

**Seneca**

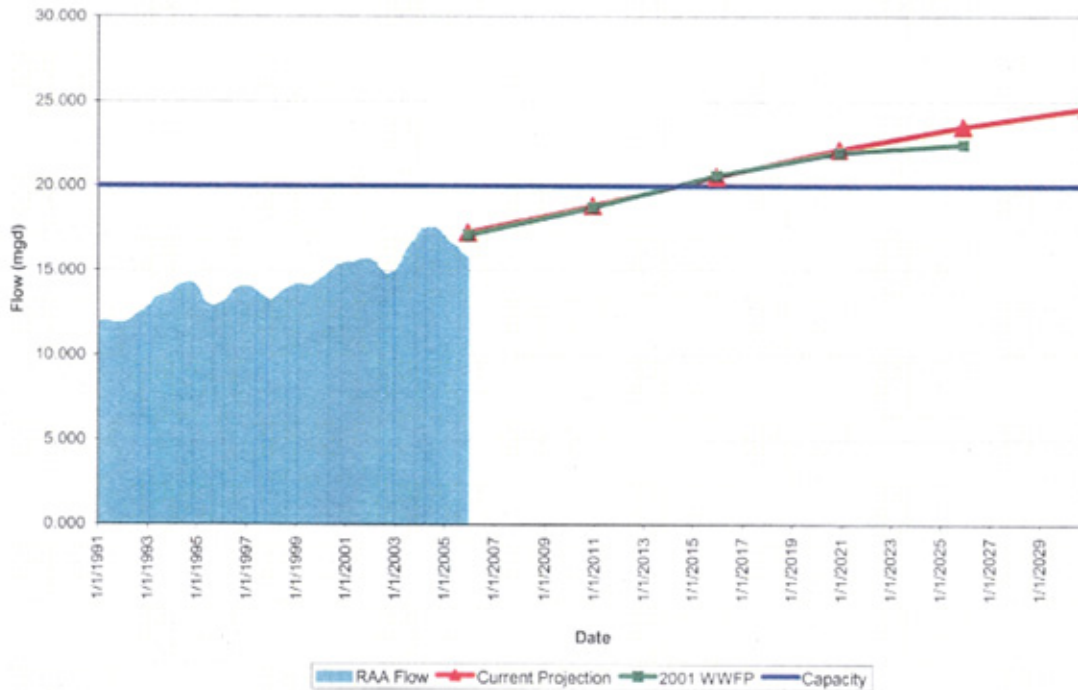
Existing Flow 2000 17.23 mgd  
 Total 17.23 mgd

Flow Factors

SFDU = 255 gpd/sfd  
 MFDU = 178 gpd/mfd  
 EMP = 40 gpd/emp

Year	SFDU	MFDU	EMP	AWF	2001 WWFP	Capacity
2005	38717	18884	70361	17.23 mgd	17.11	20
2010	42188	21178	77739	18.82 mgd	18.76	20
2015	46102	22754	89501	20.57 mgd	20.64	20
2020	48865	24760	102010	22.13 mgd	21.99	20
2025	49610	28585	114153	23.49 mgd	22.48	20
2030	49744	32565	122968	24.58 mgd	#N/A	20

Seneca WWTP Service Area Flow Projection



[Note: An expansion of the Seneca WWTP from 20mgd to 26mgd is currently underway. This expanded capacity will be sufficient to accommodate projected flows beyond the 2030 horizon of this plan.]

## Appendix 8

### Nutrient Loading Analysis

This Appendix contains the technical information on the nutrient loading analysis for existing and 2030 land cover conditions required by the State as part of fulfilling the requirements of HB 1141.

The first section deals with the land cover and septic system data analysis for the nutrient loading spreadsheet tool. The second section covers the modifications that were made to the spreadsheet tool, assumptions regarding the land cover and septic data, coordination with municipalities, 2030 Land Cover Scenarios, wastewater treatment plant nutrient discharge data, summary input data tables, summary output data tables, and summary output data charts, [to supplement those in the main plan document](#).

Cover was coded 601 – Wetlands (Forested). This layer overwrites whatever was present in the MDP land cover layer, whether it was a wetland or not.

The figure below depicts the wetlands stamped into the existing Land Cover layer. Our layer differentiates between ~~a normal wetland and~~ forested and unforested wetland. Unforested wWetlands are coded as LC\_CODE=60, Forested wetlands are coded LC\_CODE-601.

The last addition to complete the 2030 Scenario (Alternative) 1 land cover is the build out of proposed zoning for our current and ongoing master plans. The zoning for the master plans used comes from the plan itself or from in-process [Sectional Map Amendments \(SMA\)](#) to the zoning layer.

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**Current & Ongoing Master Plans**

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Gaithersburg West

Wheaton

White Flint

Aspen Hill

Olney

Germantown Forward

Shady Grove

Twinbrook

Damascus

Clarksburg

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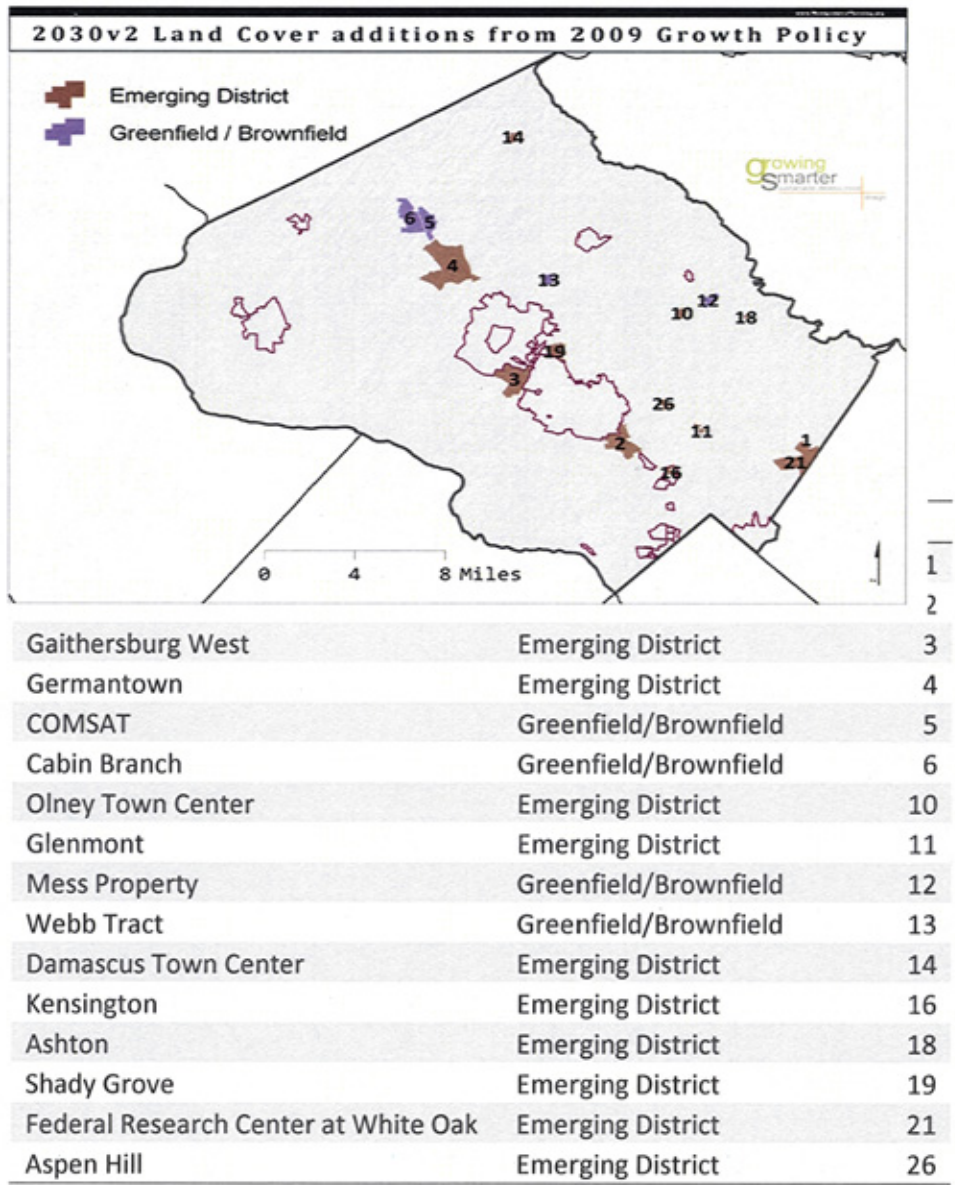


#### 4) 2030 Scenario (Alternative) 2 Land Cover

A second version of the 2030 Land cover was also established for the purposes of modeling a slightly different build out scenario. This version of the Land Cover was arrived at using the result of the 2030 alt1 as a starting point.

The Montgomery County Growth Policy Report identified a number of additional development opportunities. Scenario 2 is similar to Scenario 1, but with some additional potential areas of development that might occur regardless of horizon year. These additional areas were taken from a strategic growth map that was developed during the 2009 revision to the Growth Policy. These were stamped into the version one layer and expressed as the buildout land cover for each area's existing zoning. The following graphic shows the areas used from that Growth Policy Report:

[Sam, the caption in the following figure should read: 2030v2 Land Cover additions from 2009 Strategic Growth Map]



### 5) MWCOG Septic Analysis

One of the two septic analyses was performed using the present and future household and employment data found in the Round 7.2 MWCOG data supplied from the Research division of the Montgomery County Planning Department. This data is on a TAZ boundary level. This version of the septic analysis yields numbers of households and employees that fall outside the sewer system.

The 2005 Round7.2 forecast was intersected with the present sewer envelope. TAZ boundaries that were split by this boundary had their numbers estimated in proportion to each TAZ's [SQFT in Septic / Original SQFT]. This was then done again for the 2030 forecast and the 2030 sewer envelope.

### 6) Land Cover Septic Analysis

A similar septic analysis was established using the same sewer envelopes against the Land Cover layer for 2007 and 2030 as well. Specifically, we find the intersection of the land cover layer that is not covered by the sewer system, then total out the two classifications by the drainage basins. This model yields acres of employment and residential that is not covered by the sewer system.

The results of these analyses were used to provide the data inputs needed for the WRE nutrient loading spreadsheet: number of septic systems (number of households), and acres of non-residential on septic (acres of employment).

Because DEP has only limited data at this time on septic systems within the water and sewer envelope, the loading analysis was done considering only septic systems outside the water and sewer envelope, which nevertheless represents the large majority of septic systems in the County. When adequate data on septic systems inside the water and sewer envelope are available, those systems can be added to future pollutant loading analyses.

### Wastewater Treatment Plants (WWTPs) Nutrient Discharges

WWTP	Operator	Existing TN lb/yr	Existing TP lb/yr	2030 TN lb/yr	2030 TP lb/yr
Damascus	WSSC	7,897	973	11,925	894
Hyattstown	WSSC	500	72	500	72
Seneca	WSSC	192,889	9,369	298,116	22,359
Blue Plains (M.C. only)	D.C. WASA	1,368,475	16,746	1,149,142	21,378
Mill Bottom (In Frederick Co., but treats sewage from Rattlewood Golf Course in M.C.)	Frederick County	27	7	27	7
Poolesville	Municipal	9,137	685	9,137	685
NIH	Private	3,377	563	337	563
Federal Regional Center	Private	11	2	11	2
Bretton Woods	Private	579	97	579	97
KPC Buddhist Temple	Private	49	8	49	8

### Points of discharge from WSSC WWTPs in Montgomery County

Language from Discharge Permits issued by MDE:

DISCHARGE FROM: Damascus Wastewater Treatment Plant (WWTP)

LOCATED AT: 23730 Log House Road

Gaithersburg, Montgomery County, Maryland 20882

THROUGH OUTFALL: 001- Facility Effluent

TO: Magruder Branch

DISCHARGE FROM: Seneca Wastewater Treatment Plant

LOCATED AT: 12600 Great Seneca Highway



Germantown, Montgomery County, Maryland 20874-2900  
THROUGH OUTFALL: 001- Facility Outfall  
TO: Great Seneca Creek

DISCHARGE FROM: Hyattstown Wastewater Treatment Plant  
LOCATED AT: Southwest of the Route 355 & Route 109 Intersection  
Hyattstown, Montgomery County, Maryland 20871  
THROUGH OUTFALL: 001- Facility Effluent  
TO: the Little Bennett Creek

### **Points of discharge from non- WSSC WWTPs in Montgomery County**

DISCHARGE FROM: Poolesville Wastewater Treatment Plant  
TO: Dry Seneca Creek, near eastern edge of Poolesville

DISCHARGE FROM: National Institutes of Health, Animal Center Wastewater Treatment Plant  
LOCATED AT: 6701 Elmer School Road, Dickerson, Montgomery County, Maryland 20837  
THROUGH OUTFALL: 001- Facility Effluent  
TO: an unnamed tributary of Broad Run which flows into the Potomac River

DISCHARGE FROM: Federal Regional Center  
LOCATED AT: near Riggs Road and Zion Road  
TO: a tributary of the Hawlings River

DISCHARGE FROM: Bretton Woods Wastewater Treatment Plant  
LOCATED AT: near Violets Lock Road and River Road  
TO: an unnamed direct tributary of the Potomac River

DISCHARGE FROM: KPC Buddhist Temple  
LOCATED AT: 18400 River Road, Poolesville, MD 20837  
TO: an unnamed direct tributary of the Potomac River

**Appendix 9**  
Interagency Coordination and Public Outreach



## Water Resources Master Plan Interagency Coordination

The Plan's proposed policies and recommendations were drafted collaboratively with stakeholders and responsible agencies, including the County's departments of Environmental Protection (DEP), Permitting Services (DPS), Transportation (DOT), and Economic Development (DED). The Montgomery Soil Conservation District (MSCD), the Washington Suburban Sanitary Commission (WSSC), and the Parks Department also participated in this process.

Each agency has its own piece of the water resources picture, and brought its own perspective, responsibilities, and needs to crafting these draft policies and recommendations. Each agency, through more detailed existing plans and programs, such as the County's General Plan, master plans, Growth Policy, MS-4 Permit, and the Water and Sewer Plan, will provide the more detailed analysis and implementation efforts needed to achieve the goals of this Water Resources **Functional Plan**.

## Public Outreach

The Plan's recommendations were also developed through public outreach on the purpose, scope, goals, schedule, and strategies. Planning staff met with various stakeholder groups to present policies and recommendations for discussion and comment.

These groups included:

- The Patuxent River Commission
- The Middle Potomac Tributary Team
- The Patuxent Reservoirs Technical Advisory Committee
- Montgomery County Water Quality Advisory **GroupBoard**
- Maryland-National Capital Building Industry Association (MNCBIA)
- Anacostia Watershed Citizens Advisory Committee
- Agriculture Advisory Committee
- Forest Advisory Committee
- MC GREENetwork (for environmental educators in the County)
- Chesapeake Bay Program Stormwater Workgroup
- Stormwater Partners Network (**includeswith** representatives from):
  - Audubon Naturalist Society
  - Patuxent Riverkeeper
  - Little Falls Watershed Alliance
  - Clean Water Action
  - Anacostia Watershed Society
  - Neighbors of the Northwest Branch
  - Potomac Conservancy
  - Friends of the Earth
  - Friends of Rock Creek's Environment (FORCE)
  - Potomac Riverkeeper
  - Earth Conservation Corps
  - Montgomery County Civic Federation
  - Friends of Sligo Creek
  - Natural Resources Defense Council (NRDC)
  - Save the Bay