

APPENDIX

MAY 2010

water resources

FUNCTIONAL PLAN



Appendix 8

Nutrient Loading Analysis



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

MontgomeryPlanning.org

Nutrient Loading Analysis

For the required Nutrient Loading Analysis, the State Nutrient Loading Spreadsheet provided for Montgomery County was used with modifications. The State spreadsheet was created using 2002 land cover data. Subsequently, more current State land cover data (2007) became available. The County requested and received the updated 2007 data from the State and found it to be accurate. As a result, the 2007 land cover data was used in the nutrient analysis.

Using the 2007 land cover data in the State loading spreadsheet, however, involved some assumptions. In 2007, the State added two new land cover types: 70-Barren Land, and 192-Large Lot Subdivision (forest). In the nutrient analysis, 70-Barren Land was combined with 73-Bare Ground, and 192-Large Lot Subdivision (forest) was combined with 41-Deciduous Forest.

In addition, three additional land cover types not used by the State in 2007 were incorporated in the County's 2007 Land Cover Map because County-specific data were available. These additional land cover types include: 121-Mixed Use Residential, 149-Mixed Use Commercial, and 601 Wetlands (forested). Again, in using the State Nutrient Loading Spreadsheet, these were combined with land cover types already in the spreadsheet. This was necessary to avoid disrupting the operation of the spreadsheet, and because the loading rates from these additional land cover types were not available. The loading rates from these new cover types would, however, be expected to be quite similar to the cover types with which they were combined. Accordingly, 121-Mixed Use Residential was combined with 13-High Density Residential, 149-Mixed Use Commercial was combined with 14-Commercial, and 601 Wetlands (forested) was combined with 60-Wetlands.

Land Cover Codes

The 2007 land cover codes (with additional codes), along with the land cover codes used in the State nutrient loading spreadsheet are listed below.

2007 Land Cover Codes (with 3 additional codes)

11-Low-density residential
12-Medium-density residential
13-High-density residential
14-Commercial
15-Industrial
16-Institutional
17-Extractive
18-Open urban land
21-Cropland
22-Pasture
23-Orchards/vineyards/horticulture
24-Feeding operations+fisheries
25-Row and garden crops
41-Deciduous forest
42-Evergreen forest
43-Mixed forest

State Nutrient Loading Model Land Cover Codes

11-Low Density Residential
12-Medium Density Residential
13-High Density Residential
14-Commercial
15-Industrial
16-Institutional
17-Extractive
18-Open Urban Land
21-Cropland
22-Pasture
23-Orchards
24-Feeding Operations
25-Row and Garden Crops
41-Deciduous Forest
42-Evergreen Forest
43-Mixed Forest

44-Brush
 50-Water
 60-Wetlands
 70-Barren land
 71-Beaches
 72-Bare exposed rock
 73-Bare ground
 80-Transportation
 129-Mixed Use Residential
 149-Mixed Use Commercial
 191-Large lot subdivision(AG)
 192-Large lot subdivision (forest)
 241-Feeding operations
 242-Breeding and Training
 601-Wetlands (Forested)

44-Brush
 50-Water
 60-Wetlands
 71-Beaches
 72-Bare Rock
 73-Bare Ground
 80-Transportation
 191-Rural Residential
 241-Feeding Operations
 242-Agricultural Buildings

Land Cover Types and Descriptions

The following table presents a general description of the land codes and associated land cover types:

Land Code	Description
11	Low-density residential - Detached single-family/duplex dwelling units, yards and associated areas. Areas of more than 90 percent single-family/duplex dwelling units, with lot sizes of less than five acres but at least one-half acre (.2 dwelling units/acre to 2 dwelling units/acre).
12	Medium-density residential - Detached single-family/duplex, attached single-unit row housing, yards, and associated areas. Areas of more than 90 percent single-family/duplex units and attached single-unit row housing, with lot sizes of less than one-half acre but at least one-eighth acre (2 dwelling units/acre to 8 dwelling units/acre).
13	High-density residential - Attached single-unit row housing, garden apartments, high-rise apartments/condominiums, mobile home and trailer parks; areas of more than 90 percent high-density residential units, with more than 8 dwelling units per acre.
14	Commercial - Retail and wholesale services. Areas used primarily for the sale of products and services, including associated yards and parking areas.
15	Industrial - Manufacturing and industrial parks, including associated warehouses, storage yards, research laboratories, and parking areas.
16	Institutional - Elementary and secondary schools, middle schools, junior and senior high schools, public and private colleges and universities, military installations (built-up areas only, including buildings and storage, training, and similar areas), churches, medical and

health facilities, correctional facilities, and government offices and facilities that are clearly separable from the surrounding land cover.

- 17 Extractive - Surface mining operations, including sand and gravel pits, quarries, coal surface mines, and deep coal mines. Status of activity (active vs. abandoned) is not distinguished.
- 18 Open urban land - Urban areas whose use does not require structures, or urban areas where non-conforming uses characterized by open land have become isolated. Included are golf courses, parks, recreation areas (except areas associated with schools or other institutions), cemeteries, and entrapped agricultural and undeveloped land within urban areas.
- 129 Mixed Use Residential—Mixed use with an emphasis on residential uses. Areas mapped as Mixed Use Residential are taken from information provided by Gaithersburg and Rockville, County Area and Sector Master Plans, and information from the development pipeline.
- 149 Mixed Use Commercial—Mixed use with an emphasis on commercial uses. Areas mapped as Mixed Use Commercial are Central Business Districts (CBDs), and redevelopment areas in Town Centers.
- 191 Large lot subdivision (agriculture) - Residential subdivisions with lot sizes of less than 20 acres but at least 5 acres, with a dominant land cover of open fields or pasture.
- 192 Large lot subdivision (forest) - Residential subdivisions with lot sizes of less than 20 acres but at least 5 acres, with a dominant land cover of deciduous, evergreen or mixed forest.

Agriculture

- 21 Cropland - Field crops and forage crops.
- 22 Pasture - Land used for pasture, both permanent and rotated; grass.
- 23 Orchards/vineyards/horticulture - Areas of intensively managed commercial bush and tree crops, including areas used for fruit production, vineyards, sod and seed farms, nurseries, and green houses.
- 24 Feeding operations - Cattle feed lots, holding lots for animals, hog feeding lots, poultry houses, and commercial fishing areas (including oyster beds).
- 241 Feeding operations - Cattle feed lots, holding lots for animals, hog feeding lots, poultry houses.
- 242 Agricultural building breeding and training facilities, storage facilities, built-up areas associated with a farmstead, small farm ponds, commercial fishing areas.

- 25 Row and garden crops - Intensively managed truck and vegetable farms and associated areas.

Forest

- 41 Deciduous forest - Forested areas in which the trees characteristically lose their leaves at the end of the growing season. Included are such species as oak, hickory, aspen, sycamore, birch, yellow poplar, elm, maple, and cypress.
- 42 Evergreen forest - Forested areas in which the trees are characterized by persistent foliage throughout the year. Included are such species as white pine, pond pine, hemlock, southern white cedar, and red pine.
- 43 Mixed forest - Forested areas in which neither deciduous nor evergreen species dominate, but in which there is a combination of both types.
- 44 Brush - Areas which do not produce timber or other wood products but may have cut-over timber stands, abandoned agriculture fields, or pasture. These areas are characterized by vegetation types such as sumac, vines, rose, brambles, and tree seedlings.

Water

- 50 Water - Rivers, waterways, reservoirs, ponds, bays, estuaries, and ocean.

Wetlands

- 60 Wetlands - non-forested wetlands, including tidal flats, tidal and non-tidal marshes, and upland swamps and wet areas.
- 601 Wetlands – Forested

Barren Land

- 70 Barren land
- 71 Beaches - Extensive shoreline areas of sand and gravel accumulation, with no vegetative cover or other land use.
- 72 Bare exposed rock - Areas of bedrock exposure, scarps, and other natural accumulations of rock without vegetative cover.
- 73 Bare ground - Areas of exposed ground caused naturally, by construction, or by other cultural processes.

Transportation

- 80 Transportation – Road ROW for secondary roads, primary roads, arterial roads, highways, etc. (does not include tertiary roads, neighborhood roads, sidestreets, etc.).

In addition, County transportation data pertaining to major roads and highways were used to add to the Transportation Land Cover. This provides better data relating to imperviousness, since such roads are not accounted for in the other land cover types. The imperviousness associated with Transportation land cover was also modified from that used in the spreadsheet model. County GIS analysis using total pavement divided by total Right of Way (ROW) area yielded a higher imperviousness value of 0.50.

Coordination with Municipalities

The County’s Nutrient Loading Analysis was coordinated with the municipalities that have planning and zoning authority:

- Rockville
- Gaithersburg
- Poolesville
- Washington Grove
- Laytonsville
- Brookeville
- Barnesville.

Each municipality reviewed and provided any needed modifications to the 2007 land cover data from the State, and provided 2030 land cover projections for use in the County 2030 loading scenarios.

Other Modifications Made to the State Nutrient Spreadsheet

The State nutrient spreadsheet for Montgomery County designated a portion of the County as being below the Fall Line. The Fall Line is a physiographic feature that separates the Piedmont physiographic province from the Upper Coastal Plain province. The State loading spreadsheet uses different nutrient loading factors (taken from the Chesapeake Bay Model) for the Piedmont and the Coastal Plain provinces.

Although generally referred to as a “line”, the Fall Line is actually a narrow zone, and not a distinct line feature. In fact, the Fall Line is sometimes referred to and mapped by geologists, more accurately, as the Fall Zone. The Fall Zone, then, is a transitional zone between the Piedmont and Coastal Plain provinces, and has features that grade from Piedmont on the western side of the Zone, to more Upper Coastal Plain in nature on the eastern side. The Fall Zone occupies a very narrow portion of the easternmost part of the County, and because of it, the Piedmont physiography of the County does not substantially give way to Coastal Plain characteristics until the County border with Prince George’s County, if not somewhat east of the border itself.

Because fully developed Coastal Plain characteristics do not exist in Montgomery County and the areal coverage of the Fall Zone is very small compared with the entire County, it makes more sense, especially with a generalized loading model, to make the simplifying assumption that the entire County is “above

the Fall Line.” This modification was also made because close inspection of the State nutrient loading spreadsheet revealed that the area considered as “below the Fall Line” in the spreadsheet actually extended well into the Piedmont Province itself, to include all the watersheds that drain to the Fall Zone, rather than including only that portion of County watersheds below the “Fall Line” (i.e. the western side of the Fall Zone). This approach was evidently a simplifying assumption, made at a Chesapeake Bay scale for the purposes of the Bay Model. This approach doesn’t make sense at the County scale, and would only serve to introduce much greater error into local calculations than any error introduced by considering the entire County as being within the Piedmont Province.

As a result, for the purposes of the nutrient loading analysis, the whole of Montgomery County is considered to be above the Fall Line.

2030 Land Cover Scenarios

2030 Land Cover Scenarios

As requested by the State, two alternative 2030 Land Cover Scenarios were prepared for input into the nutrient spreadsheet model. Because there is little vacant land left in the County, the two 2030 land cover scenarios were not very different.

Scenario 1

Scenario 1 was based on information contained in County area and sector master plans, municipality projections, and the development pipeline in conjunction with demographic and employment projections for 2030.

Scenario 2

Scenario 2 is similar to Scenario 1, but with additional areas of development and redevelopment as identified in the County’s Growth Policy.

Septic Systems Data

Septic system data were projected for 2030 based on the methodology described in the Land Cover and Septic System Data Analysis section of this appendix. In order to use septic loadings for Existing and 2030 Land Cover that are consistent in methodology, the septic loadings for Existing Conditions were calculated using the same methodology as used for 2030.

Wastewater Treatment Plant (WWTP) Nutrient Discharge Data

Data received from WSSC pertaining to yearly existing and 2030 WSSC WWTP discharges were used in the spreadsheet analysis. In addition, data pertaining to private WWTPs that discharge to surface waters in the County were also added to the County total. It should be noted that most of the collected wastewater in Montgomery County is routed to the Blue Plains WWTP, which is located in the District of Columbia. Consequently, most of the processed sewage from Montgomery County is not discharged to Montgomery County waters. Nevertheless, the Montgomery County contribution to the Blue Plains facility was included in the nutrient spreadsheet analysis so the County’s total nutrient contributions could be accounted for, regardless of discharge point.

The following table summarizes the WWTP nutrient discharge data that were used to calculate a total Nitrogen and Total Phosphorus contribution from public and private WWTPs, for use in the spreadsheet. Loads for the private WWTPs were taken from State permit data on Tributary Strategies allocations.

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

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 and Route 109 Intersection
Hyattstown, Montgomery County, Maryland 20871
THROUGH OUTFALL: 001- Facility Effluent
TO: 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: unnamed tributary of Broad Run into the Potomac River

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

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

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

2007 Landuse, Septic and Point-Source Load Data

Land Use/Cover	Patuxent AFL	Potomac AFL	TOTAL
	(acres) Nitrogen	(acres) Nitrogen	(acres) Nitrogen
LULC11 (Low Density Residential)	5,382	36,972	42,355
LULC12 (Medium Density Residential)	1,507	49,160	50,667
LULC13 (High Density Residential)	270	13,528	13,798
LULC14 (Commercial)	250	6,362	6,612
LULC15 (Industrial)	48	4,917	4,965
LULC16 (Institutional)	818	10,842	11,659
LULC17 (Extractive)	0	386	386
LULC18 (Open Urban Land)	468	9,280	9,748
LULC21 (Cropland)	9,244	43,151	52,395
LULC22 (Pasture)	2,182	12,172	14,354
LULC23 (Orchards)	97	158	254
LULC24 (Feeding Operations)	0	0	0
LULC25 (Row and Garden Crops)	0	0	0
LULC41 (Deciduous Forest)	13,397	59,441	72,838
LULC42 (Evergreen Forest)	343	2,654	2,997
LULC43 (Mixed Forest)	525	2,376	2,902
LULC44 (Brush)	184	1,846	2,031
LULC50 (Water)	614	6,829	7,442
LULC60 (Wetlands)	901	8,357	9,258
LULC71 (Beaches)	0	0	0
LULC72 (Bare Rock)	0	0	0
LULC73 (Bare Ground)	0	237	237
LULC80 (Transportation)	459	6,814	7,273
LULC191 (Rural Residential)	2,507	5,951	8,458
LULC241 (Feeding Operations)	8	214	222
LULC242 (Agricultural Buildings)	8	122	130
TOTAL	39,213	281,769	320,981

Septic Systems	Patuxent AFL	Potomac AFL	TOTAL
	(acres) Nitrogen	(acres) Nitrogen	(acres) Nitrogen
Residential Septic Systems - Number, Conventional	5,781	20,913	26,694
Residential Septic Systems - Number, Denitrifying			0
Non-Residential Septic Systems - Acres, Conventional	655	2,499	3,154
Non-Residential Septic Systems - Acres, Denitrifying			0

Point-Source Information	2007	2030
Total Nitrogen Load (lb/yr)	1,582,923	1,463,863
Total Phosphorus Load (lb/yr)	28,522	46,065

Scenario 1 Landuse, Septic and Point-Source Load Data

Land Use/Cover	Patuxent AFL		Potomac AFL		TOTAL	
	2007 (acres)	2030 (acres)	2007 (acres)	2030 (acres)	2007 (acres)	2030 (acres)
	Nitrogen	Nitrogen	Nitrogen	Nitrogen	Nitrogen	Nitrogen
LULC11 (Low Density Residential)	5,382	5,489	36,972	38,099	42,355	43,588
LULC12 (Medium Density Residential)	1,507	1,507	49,160	49,678	50,667	51,184
LULC13 (High Density Residential)	270	341	13,528	14,984	13,798	15,325
LULC14 (Commercial)	250	178	6,362	6,949	6,612	7,127
LULC15 (Industrial)	48	48	4,917	4,441	4,965	4,490
LULC16 (Institutional)	818	815	10,842	10,787	11,659	11,602
LULC17 (Extractive)	0	0	386	381	386	381
LULC18 (Open Urban Land)	468	468	9,280	8,980	9,748	9,448
LULC21 (Cropland)	9,244	9,185	43,151	41,538	52,395	50,723
LULC22 (Pasture)	2,182	2,138	12,172	11,602	14,354	13,740
LULC23 (Orchards)	97	97	158	158	254	254
LULC24 (Feeding Operations)	0	0	0	0	0	0
LULC25 (Row and Garden Crops)	0	0	0	0	0	0
LULC41 (Deciduous Forest)	13,397	13,384	59,441	61,528	72,838	74,912
LULC42 (Evergreen Forest)	343	343	2,654	2,652	2,997	2,996
LULC43 (Mixed Forest)	525	525	2,376	2,376	2,902	2,902
LULC44 (Brush)	184	183	1,846	1,678	2,031	1,861
LULC50 (Water)	614	614	6,829	6,830	7,442	7,444
LULC60 (Wetlands)	901	900	8,357	8,303	9,258	9,202
LULC71 (Beaches)	0	0	0	0	0	0
LULC72 (Bare Rock)	0	0	0	0	0	0
LULC73 (Bare Ground)	0	0	237	237	237	237
LULC80 (Transportation)	459	476	6,814	7,642	7,273	8,117
LULC191 (Rural Residential)	2,507	2,507	5,951	5,925	8,458	8,433
LULC241 (Feeding Operations)	8	8	214	214	222	222
LULC242 (Agricultural Buildings)	8	8	122	122	130	130
TOTAL	39,213	39,213	281,769	285,104	320,981	324,317

Septic Systems	Patuxent AFL		Potomac AFL		TOTAL	
	2007 (acres)	2030 (acres)	2007 (acres)	2030 (acres)	2007 (acres)	2030 (acres)
	Nitrogen	Nitrogen	Nitrogen	Nitrogen	Nitrogen	Nitrogen
Residential Septic Systems - Number, Conventional	5,781	6,829	20,913	24,183	26,694	31,012
Residential Septic Systems - Number, Denitrifying					0	0
Non-Residential Septic Systems - Acres, Conventional	655	655	2,499	2,416	3,154	3,071
Non-Residential Septic Systems - Acres, Denitrifying					0	0

Point-Source Information	2007	2030
Total Nitrogen Load (lb/yr)	1,582,923	1,463,863
Total Phosphorus Load (lb/yr)	28,522	46,065

Scenario 2 Landuse, Septic and Point-Source Load Data

Land Use/Cover	Patuxent AFL		Potomac AFL		TOTAL	
	2007 (acres)	2030 (acres)	2007 (acres)	2030 (acres)	2007 (acres)	2030 (acres)
	Nitrogen	Nitrogen	Nitrogen	Nitrogen	Nitrogen	Nitrogen
LULC11 (Low Density Residential)	5,382	5,672	36,972	38,099	42,355	43,771
LULC12 (Medium Density Residential)	1,507	1,507	49,160	49,678	50,667	51,184
LULC13 (High Density Residential)	270	343	13,528	14,995	13,798	15,338
LULC14 (Commercial)	250	178	6,362	6,949	6,612	7,127
LULC15 (Industrial)	48	48	4,917	4,540	4,965	4,588
LULC16 (Institutional)	818	815	10,842	10,884	11,659	11,700
LULC17 (Extractive)	0	0	386	381	386	381
LULC18 (Open Urban Land)	468	468	9,280	8,980	9,748	9,448
LULC21 (Cropland)	9,244	9,125	43,151	41,538	52,395	50,663
LULC22 (Pasture)	2,182	2,136	12,172	11,512	14,354	13,648
LULC23 (Orchards)	97	97	158	158	254	254
LULC24 (Feeding Operations)	0	0	0	0	0	0
LULC25 (Row and Garden Crops)	0	0	0	0	0	0
LULC41 (Deciduous Forest)	13,397	13,384	59,441	61,411	72,838	74,795
LULC42 (Evergreen Forest)	343	343	2,654	2,652	2,997	2,996
LULC43 (Mixed Forest)	525	525	2,376	2,376	2,902	2,902
LULC44 (Brush)	184	183	1,846	1,678	2,031	1,861
LULC50 (Water)	614	614	6,829	6,830	7,442	7,444
LULC60 (Wetlands)	901	900	8,357	8,303	9,258	9,202
LULC71 (Beaches)	0	0	0	0	0	0
LULC72 (Bare Rock)	0	0	0	0	0	0
LULC73 (Bare Ground)	0	0	237	237	237	237
LULC80 (Transportation)	459	476	6,814	7,642	7,273	8,117
LULC191 (Rural Residential)	2,507	2,507	5,951	5,925	8,458	8,433
LULC241 (Feeding Operations)	8	8	214	214	222	222
LULC242 (Agricultural Buildings)	8	8	122	122	130	130
TOTAL	39,213	39,336	281,769	285,104	320,981	324,440

Septic Systems	Patuxent AFL		Potomac AFL		TOTAL	
	2007 (acres)	2030 (acres)	2007 (acres)	2030 (acres)	2007 (acres)	2030 (acres)
	Nitrogen	Nitrogen	Nitrogen	Nitrogen	Nitrogen	Nitrogen
Residential Septic Systems - Number, Conventional	5,781	6,829	20,913	24,183	26,694	31,012
Residential Septic Systems - Number, Denitrifying					0	0
Non-Residential Septic Systems - Acres, Conventional	655	655	2,499	2,416	3,154	3,071
Non-Residential Septic Systems - Acres, Denitrifying					0	0

Point-Source Information	2007	2030
Total Nitrogen Load (lb/yr)	1,582,923	1,463,863
Total Phosphorus Load (lb/yr)	28,522	46,065

Nutrient Analysis Results

The following charts and tables summarize the results of the nutrient analysis.

Nutrient Loading Analysis Spreadsheet - Summary Results

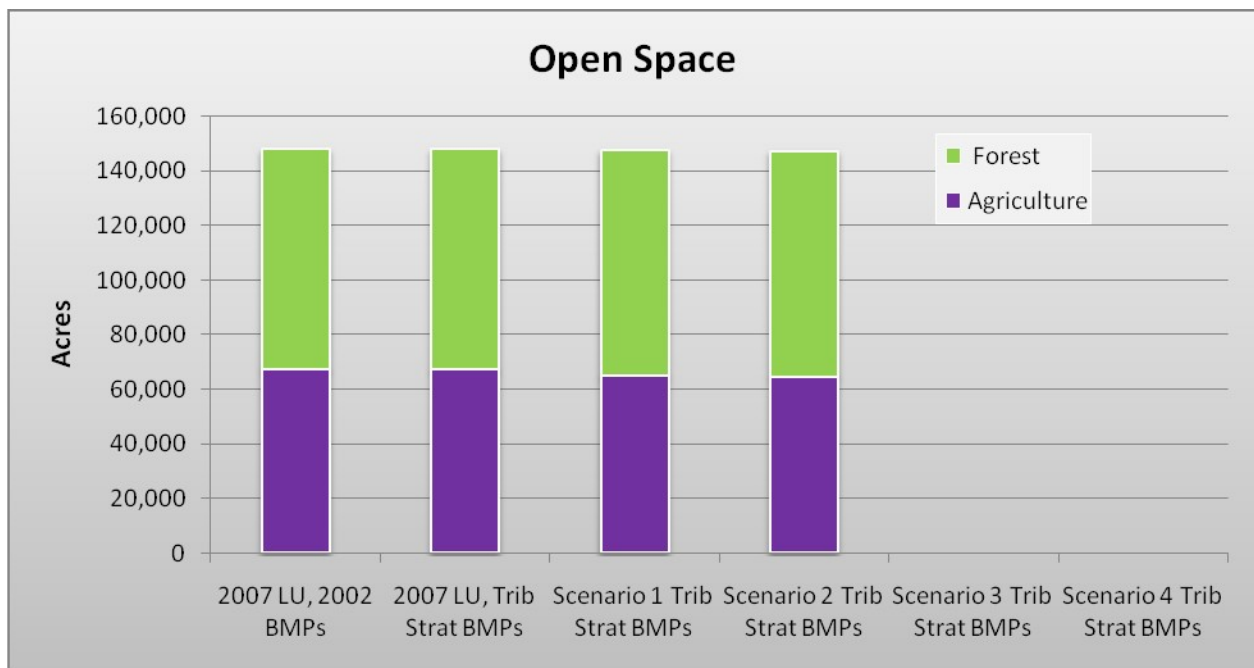
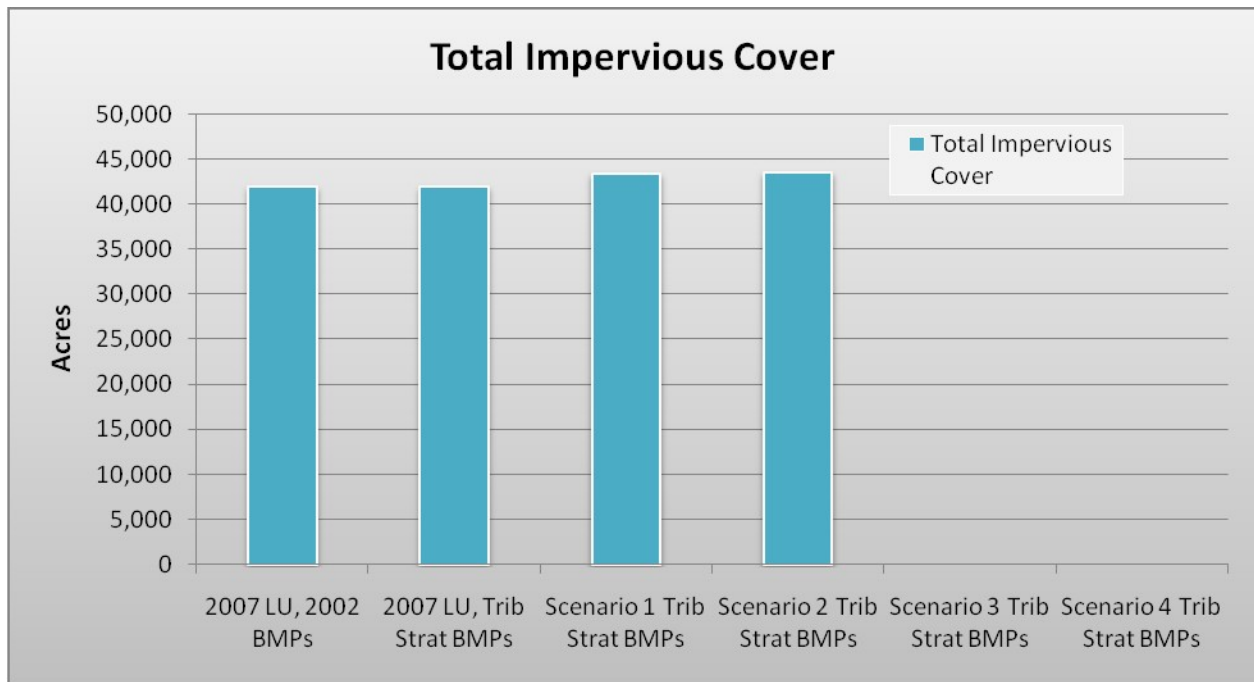
Land Use and Septic Systems				
	2007 LU, 2002 BMPs (Acres)	2007 LU, Trib Strat BMPs (Acres)	Scenario 1 Trib Strat BMPs (Acres)	Scenario 2 Trib Strat BMPs (Acres)
Development	134,127	134,127	138,264	138,558
Agriculture	67,356	67,356	65,068	64,917
Forest	90,025	90,025	91,873	91,756
Water	7,442	7,442	7,444	7,444
Other	22,031	22,031	21,668	21,766
Total Area	320,981	320,981	324,317	324,440
Residential Septic (EDUs)	26,694	26,694	31,012	31,012
Non-Residential Septic (EDUs)	7,885	7,885	7,677	7,677

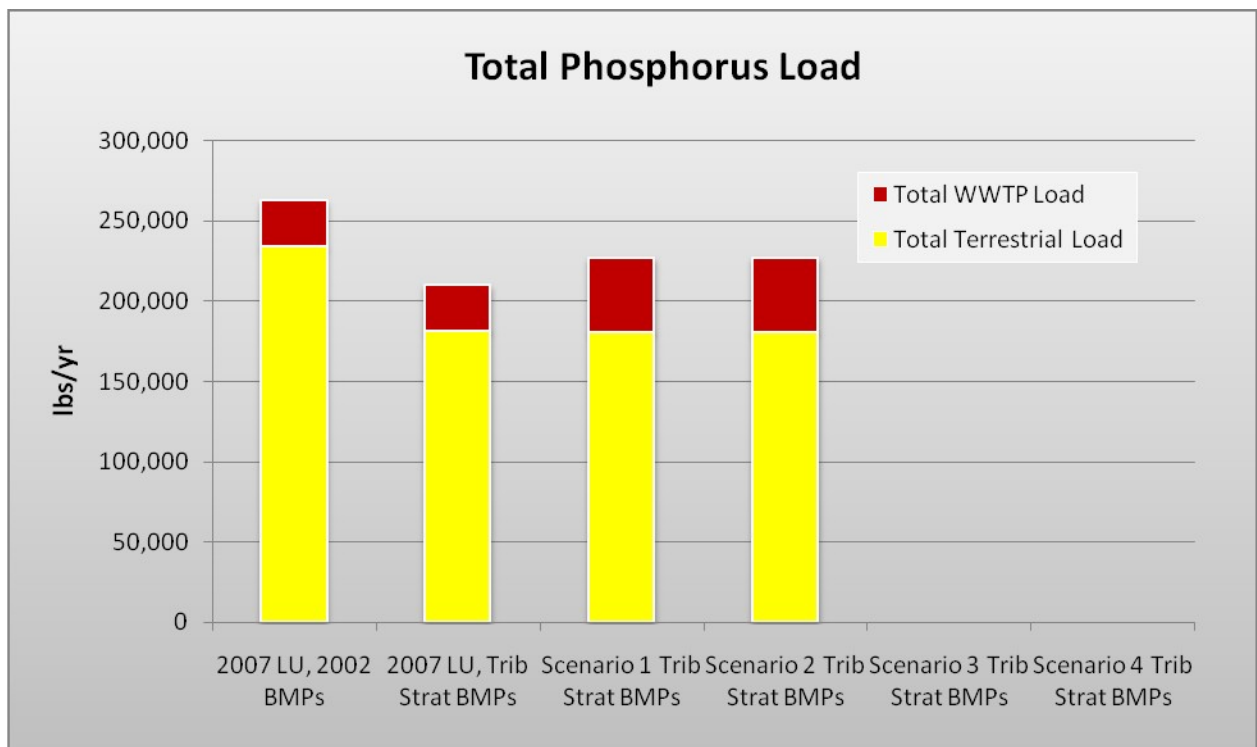
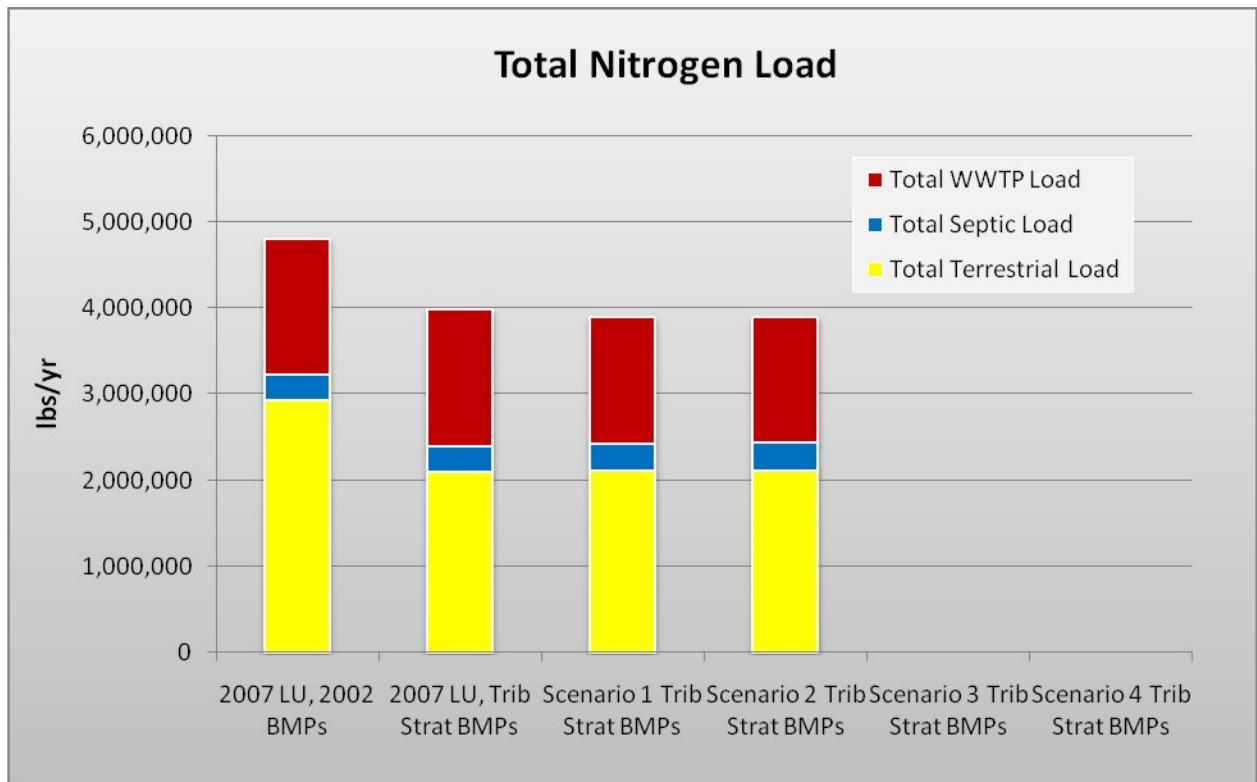
Total Nitrogen Loading				
	2007 LU, 2002 BMPs (Lbs/Yr)	2007 LU, Trib Strat BMPs (Lbs/Yr)	Scenario 1 Trib Strat BMPs (Lbs/Yr)	Scenario 2 Trib Strat BMPs (Lbs/Yr)
Development Stormwater Load	1,321,564	955,337	984,220	986,346
Agriculture Non-Point Source	1,202,109	817,490	790,476	788,616
Forest Non-Point Source	189,623	176,079	179,803	179,568
Other Terrestrial Non-Point Source	220,192	159,284	156,622	157,307
Total Terrestrial Load	2,933,488	2,108,190	2,111,121	2,111,837
Residential Septic (EDUs)	269,825	269,825	299,332	299,332
Non-Residential Septic (EDUs)	28,438	28,438	26,440	26,440
Total Septic Load	298,263	298,263	325,772	325,772
Total Non-Point Source Nitrogen Load	3,231,752	2,406,454	2,436,892	2,437,609
Total WWTP Load	1,582,923	1,582,923	1,463,863	1,463,863
Total Nitrogen Load (NPS+PS)	4,814,675	3,989,377	3,900,755	3,901,472

Total Phosphorus Loading				
	2007 LU, 2002 BMPs (Lbs/Yr)	2007 LU, Trib Strat BMPs (Lbs/Yr)	Scenario 1 Trib Strat BMPs (Lbs/Yr)	Scenario 2 Trib Strat BMPs (Lbs/Yr)
Development Stormwater Load	125,705	83,960	86,445	86,625
Agriculture Non-Point Source	85,047	81,498	78,703	78,520
Forest Non-Point Source	2,235	1,943	1,984	1,982
Other Terrestrial Non-Point Source	21,424	14,291	14,047	14,106
Total Terrestrial Load	234,412	181,693	181,179	181,233
Total WWTP Load	28,522	28,522	46,065	46,065
Total Phosphorus Load (NPS+PS)	262,934	210,215	227,244	227,298

Impervious Cover and Open Space				
	2007 LU, 2002 BMPs	2007 LU, Trib Strat BMPs	Scenario 1 Trib Strat BMPs	Scenario 2 Trib Strat BMPs
Total Impervious Cover	42,019	42,019	43,456	43,572
Open Space - Agriculture	67,356	67,356	65,068	64,917
Open Space - Forest	80,768	80,768	82,670	82,553

Additional Summary Output Data Charts (see Plan text for other summary output charts)





Additional Output Data Summary Charts may be found in the Water Resources Plan text.