Maryland Phase II WIP Strategies

WORCESTER
Agriculture - Annual Practices

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	**Unit**			
Conservation Tillage	Acres/Year	22,020	32,905	32,908
Cover Crop	Acres/Year	6,093	19,667	20,002
Cropland Irrigation Management	Acres/Year	0	5,234	5,234
Dairy Manure Incorporation	Acres/Year	0	120	200
Nutrient Management (All forms)	Acres/Year	26,656	39,045	40,263
Poultry Litter Incorporation	Acres/Year	0	11,999	20,001
Soil Conservation and Water Quality Plans	Acres/Year	21,015	33,373	37,241

• The BMP values are the amount credited in the Bay watershed model. It is the amount of BMP submitted minus the amount not given credit for (e.g., due to overlapping with other BMPs)

WORCESTER
Agriculture - Additional BMPs

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	**Unit**			
Barnyard Runoff Control	Acres	0	6	10
Forest Buffers	Acres	2,411	2,411	2,411
Grass Buffers / Vegetated Open Channel	Acres	3,285	3,386	3,453
Heavy Use Poultry Area Concrete Pads	Acres	0	13	9
Horse Pasture Management	Acres	0	12	20
Land Retirement	Acres	126	407	597
Loafing Lot Management	Acres	0	0	1
Off Stream Watering Without Fencing	Acres	8	8	8
Prescribed Grazing	Acres	0	120	200
Sorbing Materials in Ag Ditches	Acres	0	559	931
Stream Access Control with Fencing	Acres	1	1	1
Tree Planting / Vegetative Environmental Buffers	Acres	849	949	1,015
Water Control Structures	Acres	0	736	1,226
Wetland Restoration	Acres	651	716	759

• The BMP values represent the total amount of implementation in place.
• The BMP values are the amount credited in the Bay watershed model. It is the amount of BMP submitted minus the amount not given credit for (e.g., due to overlapping with other BMPs)

Please note: The Agricultural BMP tables represent Land BMPs that can be shown as acres or feet and do not show those BMPs that are based on percentages such as Animal Waste Storage and Poultry Litter Treatment (Alum). Manure Transport is also not represented in these tables.

WORCESTER
Forest BMPs

			2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	**Zone**	**Unit**			
Forest Harvesting Practices	harvested forest	Acres	753	1,104	1,104

• The BMP values represent the total amount of implementation in place.
• The BMP values are the amount credited in the Bay watershed model. It is the amount of BMP submitted minus the amount not given credit for (e.g., due to overlapping with other BMPs)

WORCESTER
Developed Land BMPs

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	**Unit**			
Dry Detention Ponds and Hydrodynamic Structures	Acres	178	176	171
Dry Extended Detention Ponds	Acres	5	5	5
Impervious Urban Surface Reduction	Acres	0	1	577
MS4 Permit Stormwater Retrofit	Acres	26	26	25
Stormwater Management Generic BMP (1985 to 2002)	Acres	1,458	1,439	1,402
Stormwater Management Generic BMP (2002 to 2010)	Acres	1,478	1,459	1,421
Urban Filtering Practices	Acres	3	4	2,840
Urban Forest Buffers	Acres	0	211	283
Urban Infiltration Practices	Acres	4	4	4
Wet Ponds and Wetlands	Acres	157	155	151
Erosion and Sediment Control on Construction	Acres/Year	102	102	342
Erosion and Sediment Control on Extractive	Acres/Year	0	0	184
Forest Conservation	Acres/Year	983	983	1,078
Urban Nutrient Management	Acres/Year	469	3,353	3,173

• The BMP values represent the total amount of implementation in place.
• The BMP values are the amount credited in the Bay watershed model. It is the amount of BMP submitted minus the amount not given credit for (e.g., due to overlapping with other BMPs)

WORCESTER
Septic System BMPs

			2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	**Zone**	**Unit**			
Septic Denitrification	Critical Area	Systems	0	0	0
	Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	28	28	1,279
	Within 1000 ft of a perennial stream	Systems	9	9	616
	Septic DenitrificationTotal		***37***	***37***	***1,896***

• The BMP values represent the total amount of implementation in place.
• The BMP values are the amount credited in the Bay watershed model. It is the amount of BMP submitted minus the amount not given credit for (e.g., due to overlapping with other BMPs)

Maryland Phase II WIP Strategies

WORCESTER
Total Nitrogen Loads

		2010 Progress	2017 Interim Strategy	2025 Final Strategy	Final Target
Source Sector	**Landuse**	**Million Lbs/Yr**	**Million Lbs/Yr**	**Million Lbs/Yr**	**Million Lbs/Yr**
Agriculture	AFO	0.001	0.001	0.001	0.001
	CAFO	0.044	0.045	0.043	0.048
	Crop	0.672	0.329	0.293	0.569
	Nursery	0.034	0.032	0.032	0.032
	Pasture	0.007	0.003	0.004	0.005
	Subtotal	***0.758***	***0.409***	***0.372***	***0.654***
Forest	Harvested	0.012	0.010	0.010	0.012
	Natural	0.201	0.207	0.208	0.199
	Subtotal	***0.213***	***0.217***	***0.218***	***0.211***
Non-Tidal Atm	Non-Tidal Atm	0.008	0.008	0.008	0.008
	Subtotal	***0.008***	***0.008***	***0.008***	***0.008***
Septic	Septic	0.015	0.015	0.009	0.009
	Subtotal	***0.015***	***0.015***	***0.009***	***0.009***
Stormwater	CSS	0.000	0.000	0.000	0
	Construction	0.005	0.006	0.005	0.005
	Extractive	0.002	0.002	0.002	0.002
	Non-Regulated Developed	0.041	0.038	0.029	0.032
	Regulated Developed	0.000	0.008	0.008[1]	0.000
	Subtotal	***0.049***	***0.054***	***0.043***	***0.038***
Wastewater	CSO	0.000	0.000	0.000	0.000
	Industrial	0.000	0.000	0.000	0.000
	Municipal	0.037	0.013	0.024	0.024
	Subtotal	***0.037***	***0.013***	***0.024***	***0.024***
	Total	***1.081***	***0.717***	***0.674***	***0.945***

• The agricultural sector strategies were set to meet basin targets rather than county targets. Therefore, agricultural strategies are likely to overshoot or undershoot county targets, which can be reflected in the total countywide target results.
• Stormwater sector strategies may overshoot the county target for nitrogen (N) to meet the phosphorus (P) target, or vice versa. This is because the N and P reduction targets differ and the same BMP has different effects on the reduction of N and P.

[1] This load can be attributed to CSO disconnect

WORCESTER
Total Phosphorus Loads

		2010 Progress	2017 Interim Strategy	2025 Final Strategy	Final Target
Source Sector	**Landuse**	**Million Lbs/Yr**	**Million Lbs/Yr**	**Million Lbs/Yr**	**Million Lbs/Yr**
Agriculture	AFO	0.000	0.000	0.000	0.000
	CAFO	0.007	0.006	0.006	0.007
	Crop	0.044	0.018	0.016	0.047
	Nursery	0.010	0.009	0.009	0.009
	Pasture	0.001	0.000	0.001	0.000
	Subtotal	***0.063***	***0.034***	***0.032***	***0.063***
Forest	Harvested	0.000	0.000	0.000	0.000
	Natural	0.004	0.005	0.005	0.004
	Subtotal	***0.005***	***0.005***	***0.005***	***0.005***
Non-Tidal Atm	Non-Tidal Atm	0.000	0.000	0.000	0.000
	Subtotal	***0.000***	***0.000***	***0.000***	***0.000***
Septic	Septic	0.000	0.000	0.000	0.000
	Subtotal	***0.000***	***0.000***	***0.000***	***0.000***
Stormwater	CSS	0.000	0.000	0.000	0
	Construction	0.001	0.001	0.001	0.001
	Extractive	0.000	0.000	0.000	0.000
	Non-Regulated Developed	0.003	0.003	0.002	0.002
	Regulated Developed	0.000	0.000	0.000	0.000
	Subtotal	***0.004***	***0.004***	***0.003***	***0.003***
Wastewater	CSO	0.000	0.000	0.000	0.000
	Industrial	0.000	0.000	0.000	0.000
	Municipal	0.003	0.001	0.002	0.002
	Subtotal	***0.003***	***0.001***	***0.002***	***0.002***
	Total	***0.075***	***0.044***	***0.042***	***0.073***

• The agricultural sector strategies were set to meet basin targets rather than county targets. Therefore, agricultural strategies are likely to overshoot or undershoot county targets, which can be reflected in the total countywide target results.
• Stormwater sector strategies may overshoot the county target for nitrogen (N) to meet the phosphorus (P) target, or vice versa. This is because the N and P reduction targets differ and the same BMP has different effects on the reduction of N and P.

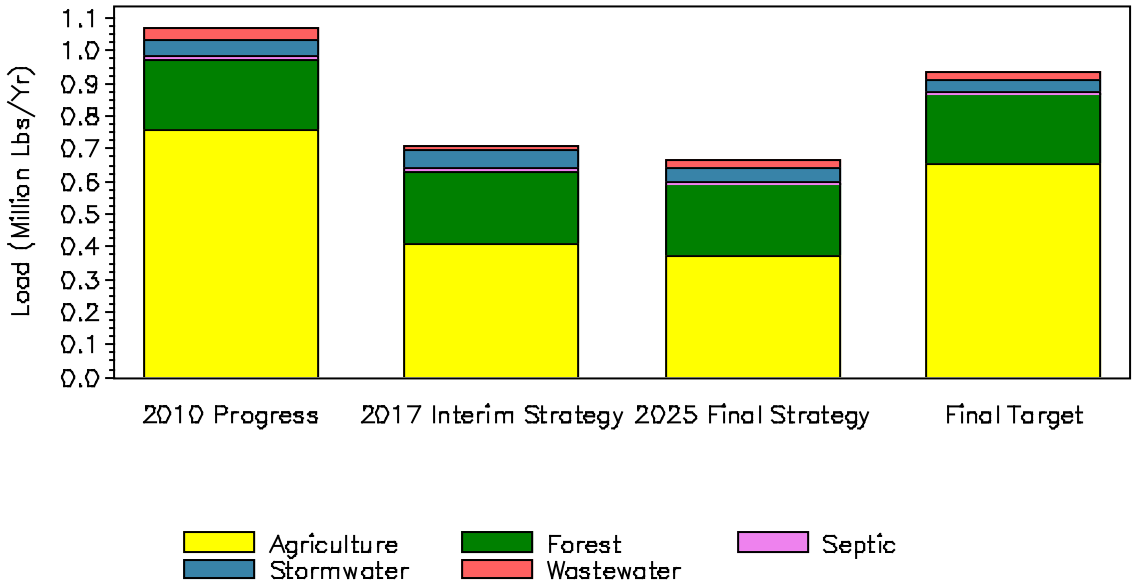
WORCESTER
Total Sediment Loads

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
Source Sector	**Landuse**	**Million Lbs/Yr**	**Million Lbs/Yr**	**Million Lbs/Yr**
Agriculture	AFO	0.000	0.000	0.000
	CAFO	0.004	0.004	0.003
	Crop	6.725	4.614	4.538
	Nursery	0.065	0.053	0.052
	Pasture	0.040	0.033	0.035
	Subtotal	***6.834***	***4.704***	***4.628***
Forest	Harvested	0.210	0.161	0.161
	Natural	1.286	1.322	1.325
	Subtotal	***1.495***	***1.483***	***1.486***
Non-Tidal Atm	Non-Tidal Atm	0.000	0.000	0.000
	Subtotal	***0.000***	***0.000***	***0.000***
Septic	Septic	0.000	0.000	0.000
	Subtotal	***0.000***	***0.000***	***0.000***
Stormwater	CSS	0.000	0.000	0.000
	Construction	0.477	0.548	0.371
	Extractive	0.169	0.169	0.114
	Non-Regulated Developed	1.015	1.015	0.535
	Regulated Developed	0.008	0.153	0.149[2]
	Subtotal	***1.669***	***1.886***	***1.169***
Wastewater	CSO	0.000	0.000	0.000
	Industrial	0.002	0.002	0.002
	Municipal	0.055	0.098	0.180
	Subtotal	***0.056***	***0.100***	***0.183***
	Total	***10.055***	***8.173***	***7.466***

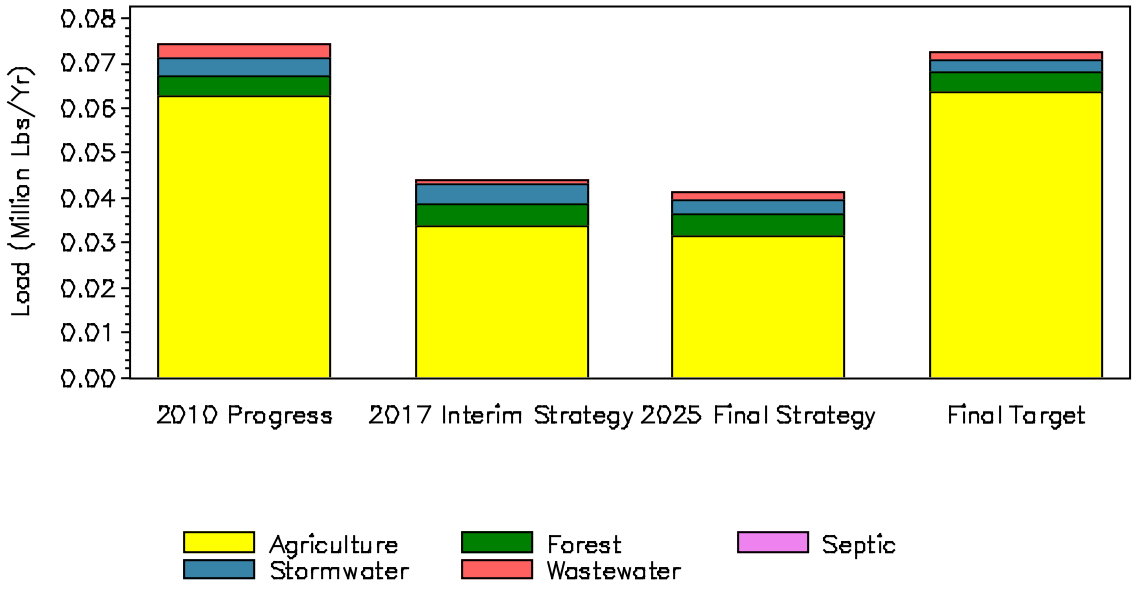
• The State did not distribute EPA's state and basin targets at the county or sector scale for sediment. Hence a Final Target column is not shown.

[2] This load can be attributed to CSO disconnect

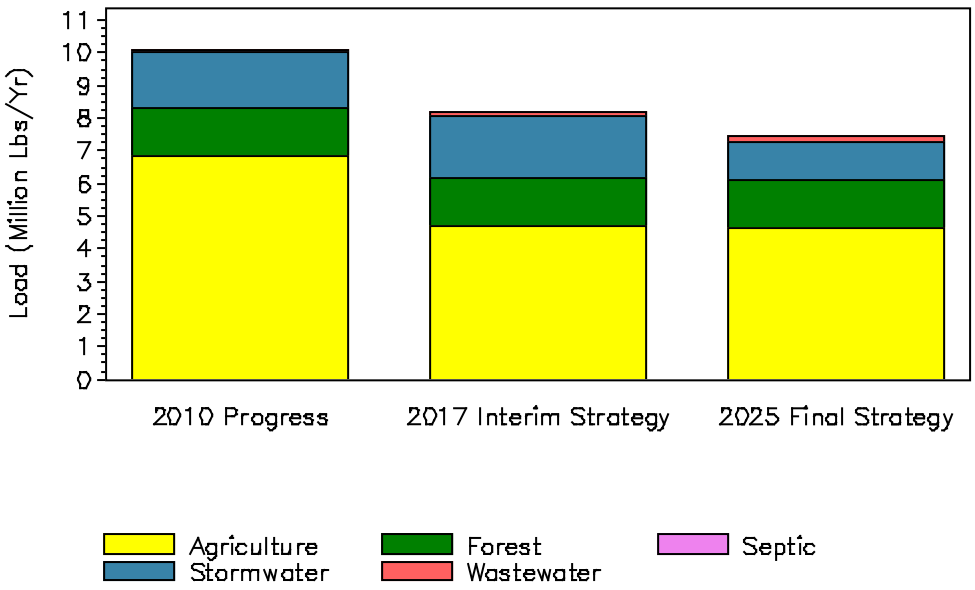
WORCESTER
Total Nitrogen Loads



WORCESTER
Total Phosphorus Loads



WORCESTER
Total Sediment Loads



• The State did not distribute EPA's state and basin targets at the county or sector scale for sediment. Hence a Final Target bar is not shown.

Maryland Phase II WIP Team MAST Submittals

WORCESTER
Developed Land BMPs

		2010 Progress	2017 WIP Team	2017 Interim Strategy	2025 WIP Team	2025 Final Strategy	Change in 2017 Submittal	Change in 2025 Submittal
BMP Name	**Unit**							
Dry Detention Ponds and Hydrodynamic Structures	Acres	178	178	176	178	171	-2	-7
Dry Extended Detention Ponds	Acres	5	5	5	5	5	-0	-0
Impervious Urban Surface Reduction	Acres	0	0	1	0	577	1	577
MS4 Permit Stormwater Retrofit	Acres	26	26	26	26	25	-0	-1
Stormwater Management Generic BMP (1985 to 2002)	Acres	1,458	1,458	1,439	1,458	1,402	-19	-57
Stormwater Management Generic BMP (2002 to 2010)	Acres	1,478	1,478	1,459	1,478	1,421	-20	-58
Urban Filtering Practices	Acres	3	3	4	3	2,840	1	2,837
Urban Forest Buffers	Acres	0	0	211	0	283	211	283
Urban Infiltration Practices	Acres	4	4	4	4	4	-0	-0
Wet Ponds and Wetlands	Acres	157	157	155	157	151	-2	-6
Erosion and Sediment Control on Construction	Acres/Year	102	102	102	102	342	0	240
Erosion and Sediment Control on Extractive	Acres/Year	0	0	0	0	184	0	184
Forest Conservation	Acres/Year	983	983	983	983	1,078	0	95
Urban Nutrient Management	Acres/Year	469	469	3,353	469	3,173	2,884	2,704

• The BMP values represent the total amount of implementation in place.
• The BMP values are the amount credited in the Bay watershed model. It is the amount of BMP submitted minus the amount not given credit for (e.g., due to overlapping with other BMPs)
• Acres of BMPs might be observed to decrease in subsequent scenarios for several reasons:
- To meet the countywide sector target, the State supplemented the Team scenarios with a generic set of BMPs.
- Some aspects of the State strategies were automated, such that BMP levels were computed as a percentage of available acres. The application of some BMPs convert the acres of developed land to forest land, or impervious to pervious. This reduces/increases the available acres so that, if the same percentage level of other BMPs is applied to these lands, then a decrease/increase in BMP acreage might be observed even though the implementation level was intedend to remain equal.
- Because the Bay watershed model is not able to account for BMPs that treat overlapping areas (nested BMPs), the acreage available for BMPs can be used up before the Final Target is achieved. In such cases the State gave precedance to the more effective BMPs.
• The columns labeled Team include the State Highway Administration (SHA) strategies as well as 2010 Progress levels for other entities.
• The columns for Interim and Final strategies include numbers for SHA, federal facilities, State lands, industrial facilities, Phase I and II MS4 and non-regulated stormwater where applicable. They also reflect changes made by the State.

WORCESTER
Septic System BMPs

			2010 Progress	2017 WIP Team	2017 Interim Strategy	2025 WIP Team	2025 Final Strategy	Change in 2017 Submittal	Change in 2025 Submittal
BMP Name	**Zone**	**Unit**							
Septic Denitrification	Critical Area	Systems	0	0	0	0	0	0	0
	Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	28	28	28	28	1,279	0	1,252
	Within 1000 ft of a perennial stream	Systems	9	9	9	9	616	0	608
	Septic DenitrificationTotal		***37***	***37***	***37***	***37***	***1,896***	***0***	***1,859***

• The BMP values represent the total amount of implementation in place.
• The BMP values are the amount credited in the Bay watershed model. It is the amount of BMP submitted minus the amount not given credit for (e.g., due to overlapping with other BMPs)

Maryland Phase II WIP Team MAST Submittals

WORCESTER
Total Nitrogen Loads

		2010 Progress	2017 WIP Team	2017 Interim Strategy	2025 WIP Team	2025 Final Strategy	Final Target
Source Sector	**Landuse**	**Million Lbs/Yr**	**Million Lbs/Yr**	**Million Lbs/Yr**	**Million Lbs/Yr**	**Million Lbs/Yr**	**Million Lbs/Yr**
Stormwater	CSS	0.000	0.000	0.000	0.000	0.000	0
	Construction	0.005	0.005	0.006	0.005	0.005	0.005
	Extractive	0.002	0.002	0.002	0.002	0.002	0.002
	Non-Regulated Developed	0.041	0.042	0.038	0.042	0.029	0.032
	Regulated Developed	0.000	0.000	0.008	0.000	0.008	0.000
	Subtotal	***0.049***	***0.049***	***0.054***	***0.049***	***0.043***	***0.038***
Septic	Septic	0.015	0.015	0.015	0.015	0.009	0.009
	Subtotal	***0.015***	***0.015***	***0.015***	***0.015***	***0.009***	***0.009***

• The columns labeled Team include the State Highway Administration (SHA) strategies as well as 2010 Progress levels for other entities.
• The columns for Interim and Final strategies include numbers for SHA, federal facilities, State lands, industrial facilities, Phase I and II MS4 and non-regulated stormwater where applicable. They also reflect changes made by the State.

WORCESTER
Total Phosphorus Loads

		2010 Progress	2017 WIP Team	2017 Interim Strategy	2025 WIP Team	2025 Final Strategy	Final Target
Source Sector	**Landuse**	**Million Lbs/Yr**	**Million Lbs/Yr**	**Million Lbs/Yr**	**Million Lbs/Yr**	**Million Lbs/Yr**	**Million Lbs/Yr**
Stormwater	CSS	0.000	0.000	0.000	0.000	0.000	0
	Construction	0.001	0.001	0.001	0.001	0.001	0.001
	Extractive	0.000	0.000	0.000	0.000	0.000	0.000
	Non-Regulated Developed	0.003	0.003	0.003	0.003	0.002	0.002
	Regulated Developed	0.000	0.000	0.000	0.000	0.000	0.000
	Subtotal	***0.004***	***0.004***	***0.004***	***0.004***	***0.003***	***0.003***
Septic	Septic	0.000	0	0.000	0	0.000	0.000
	Subtotal	***0.000***	***0***	***0.000***	***0***	***0.000***	***0.000***

• The columns labeled Team include the State Highway Administration (SHA) strategies as well as 2010 Progress levels for other entities.
• The columns for Interim and Final strategies include numbers for SHA, federal facilities, State lands, industrial facilities, Phase I and II MS4 and non-regulated stormwater where applicable. They also reflect changes made by the State.

WORCESTER
Total Sediment Loads

		2010 Progress	2017 WIP Team	2017 Interim Strategy	2025 WIP Team	2025 Final Strategy
Source Sector	**Landuse**	**Million Lbs/Yr**	**Million Lbs/Yr**	**Million Lbs/Yr**	**Million Lbs/Yr**	**Million Lbs/Yr**
Stormwater	CSS	0.000	0.000	0.000	0.000	0.000
	Construction	0.477	0.477	0.548	0.477	0.371
	Extractive	0.169	0.169	0.169	0.169	0.114
	Non-Regulated Developed	1.015	1.031	1.015	1.031	0.535
	Regulated Developed	0.008	0.009	0.153	0.009	0.149
	Subtotal	***1.669***	***1.686***	***1.886***	***1.686***	***1.169***
Septic	Septic	0.000	0	0.000	0	0.000
	Subtotal	***0.000***	***0***	***0.000***	***0***	***0.000***

• The columns labeled Team include the State Highway Administration (SHA) strategies as well as 2010 Progress levels for other entities.
• The columns for Interim and Final strategies include numbers for SHA, federal facilities, State lands, industrial facilities, Phase I and II MS4 and non-regulated stormwater where applicable. They also reflect changes made by the State.