Maryland Phase II WIP Strategies

BALTIMORE
Agriculture - Annual Practices

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	**Unit**			
Conservation Tillage	Acres/Year	25,613	30,719	30,720
Cover Crop	Acres/Year	3,027	12,277	12,485
Cropland Irrigation Management	Acres/Year	0	868	868
Dairy Manure Incorporation	Acres/Year	0	240	400
Nutrient Management (All forms)	Acres/Year	24,890	53,030	54,743
Soil Conservation and Water Quality Plans	Acres/Year	32,809	38,398	42,846

• 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)

BALTIMORE
Agriculture - Additional BMPs

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	**Unit**			
Barnyard Runoff Control	Acres	86	93	93
Forest Buffers	Acres	420	480	520
Grass Buffers / Vegetated Open Channel	Acres	152	163	170
Horse Pasture Management	Acres	0	26	44
Irrigation Water Capture Reuse	Acres	0	78	130
Land Retirement	Acres	451	788	1,057
Loafing Lot Management	Acres	0	0	0
Off Stream Watering Without Fencing	Acres	4,752	5,113	5,350
Precision Intensive Rotational Grazing	Acres	0	96	160
Prescribed Grazing	Acres	36	600	999
Stream Access Control with Fencing	Acres	28	46	46
Tree Planting / Vegetative Environmental Buffers	Acres	1,465	1,465	1,465
Water Control Structures	Acres	0	86	148
Wetland Restoration	Acres	67	97	117
Non Urban Stream Restoration / Shoreline Erosion Control	Linear Feet	0	840	1,400

• 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.

BALTIMORE
Forest BMPs

			2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	**Zone**	**Unit**			
Forest Harvesting Practices	harvested forest	Acres	1,339	1,339	1,339

• 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)

BALTIMORE
Developed Land BMPs

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	**Unit**			
Bioretention / Raingardens	Acres	0	327	511
Bioswale	Acres	0	1,638	655
Dry Detention Ponds and Hydrodynamic Structures	Acres	7,976	7,977	13,037
Dry Extended Detention Ponds	Acres	1,595	1,739	8,731
Impervious Urban Surface Reduction	Acres	0	0	476
MS4 Permit Stormwater Retrofit	Acres	11,443	20,589	24,024
Stormwater Management Generic BMP (1985 to 2002)	Acres	1,735	2,549	1,050
Stormwater Management Generic BMP (2002 to 2010)	Acres	6,109	6,154	1,003
Urban Filtering Practices	Acres	61	3,463	23,739
Urban Forest Buffers	Acres	21	183	525
Urban Infiltration Practices	Acres	276	420	1,407
Urban Tree Planting / Urban Tree Canopy	Acres	0	1,740	2,144
Vegetated Open Channels	Acres	0	889	848
Wet Ponds and Wetlands	Acres	1,442	1,909	4,689
Erosion and Sediment Control on Construction	Acres/Year	1,747	1,747	1,747
Erosion and Sediment Control on Extractive	Acres/Year	0	0	461
Forest Conservation	Acres/Year	7,548	7,468	7,471
Urban Nutrient Management	Acres/Year	25,083	98,758	98,001
Street Sweeping Pounds	Lbs/Year	0	3,584,417	3,584,417
Urban Stream Restoration (interim)	Linear Feet	0	239,274	442,000
Urban Stream Restoration / Shoreline Erosion Control	Linear Feet	0	6,478	58,849

• 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)

BALTIMORE
Septic System BMPs

			2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	**Zone**	**Unit**			
Septic Connection	Critical Area	Systems	0	0	1,735
	Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	0	0	5,032
	Within 1000 ft of a perennial stream	Systems	0	0	3,094
	Septic ConnectionTotal		***0***	***0***	***9,861***
Septic Denitrification	Critical Area	Systems	7	1,323	109
	Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	91	91	47
	Within 1000 ft of a perennial stream	Systems	49	49	24
	Septic DenitrificationTotal		***147***	***1,463***	***181***
Septic Pumping	Critical Area	Systems	0	0	103
	Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	0	0	5,165
	Within 1000 ft of a perennial stream	Systems	0	0	2,692
	Septic PumpingTotal		***0***	***0***	***7,960***

• 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

BALTIMORE
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	0.003	0.001	0.001	0.001
	CAFO	0.000	0.000	0.000	0.000
	Crop	0.307	0.263	0.256	0.222
	Nursery	0.024	0.019	0.016	0.023
	Pasture	0.030	0.028	0.028	0.025
	Subtotal	***0.363***	***0.310***	***0.300***	***0.271***
Forest	Harvested	0.008	0.008	0.008	0.010
	Natural	0.143	0.147	0.147	0.142
	Subtotal	***0.151***	***0.155***	***0.156***	***0.152***
Non-Tidal Atm	Non-Tidal Atm	0.015	0.015	0.015	0.015
	Subtotal	***0.015***	***0.015***	***0.015***	***0.015***
Septic	Septic	0.167	0.156	0.107	0.106
	Subtotal	***0.167***	***0.156***	***0.107***	***0.106***
Stormwater	CSS	0.000	0.000	0.000	0
	Construction	0.017	0.017	0.017	0.019
	Extractive	0.004	0.004	0.003	0.003
	Regulated Developed	0.827	0.709	0.623	0.599
	Subtotal	***0.848***	***0.730***	***0.644***	***0.621***
Wastewater	CSO	0.000	0.000	0.000	0
	Industrial	0.253	0.405	0.152	0.179
	Municipal	2.656	1.120	1.255	1.260
	Subtotal	***2.910***	***1.526***	***1.407***	***1.439***
	Total	***4.454***	***2.893***	***2.629***	***2.604***

• 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.

BALTIMORE
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	0.000	0.000	0.000	0.000
	Crop	0.017	0.015	0.015	0.014
	Nursery	0.008	0.006	0.005	0.007
	Pasture	0.003	0.003	0.003	0.002
	Subtotal	***0.028***	***0.024***	***0.023***	***0.024***
Forest	Harvested	0.000	0.000	0.000	0.000
	Natural	0.003	0.003	0.003	0.002
	Subtotal	***0.003***	***0.003***	***0.003***	***0.003***
Non-Tidal Atm	Non-Tidal Atm	0.001	0.001	0.001	0.001
	Subtotal	***0.001***	***0.001***	***0.001***	***0.001***
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	0.003	0.003	0.003	0.003
	Extractive	0.001	0.001	0.001	0.001
	Regulated Developed	0.057	0.040	0.026	0.032
	Subtotal	***0.061***	***0.044***	***0.030***	***0.036***
Wastewater	CSO	0.000	0.000	0.000	0
	Industrial	0.026	0.031	0.027	0.027
	Municipal	0.084	0.064	0.071	0.072
	Subtotal	***0.110***	***0.095***	***0.098***	***0.099***
	Total	***0.203***	***0.166***	***0.155***	***0.162***

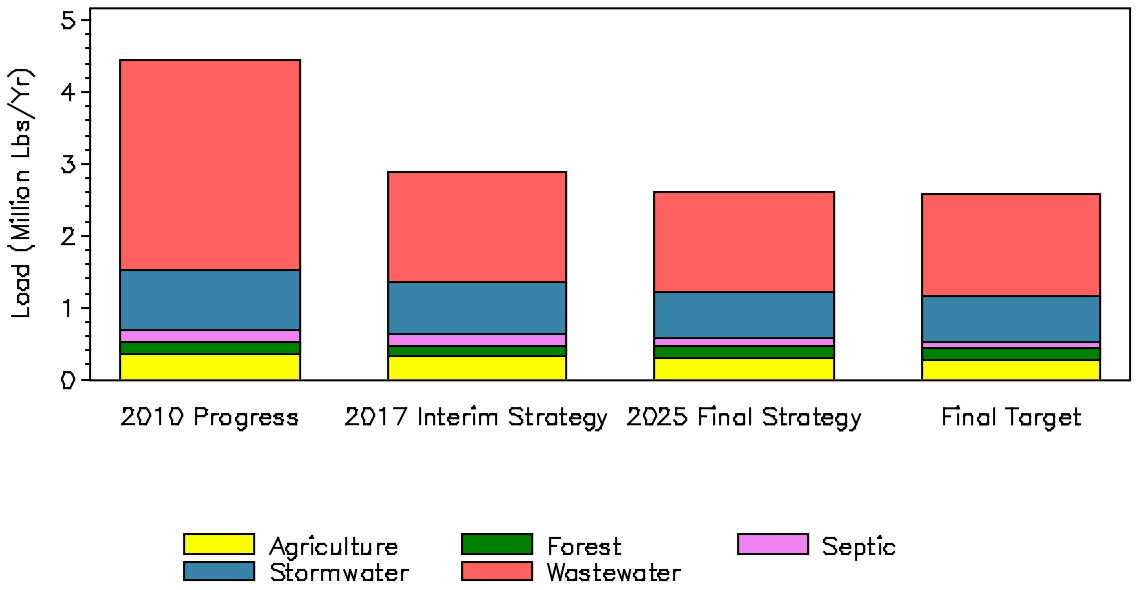
• The agricultural sector strategies were set to meet basin targets rather than county targets. Therefore, agricultural strategies are likely to overshoot or undershoot county targets, which can be reflected in the total countywide target results.
• Stormwater sector strategies may overshoot the county 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.

BALTIMORE
Total Sediment Loads

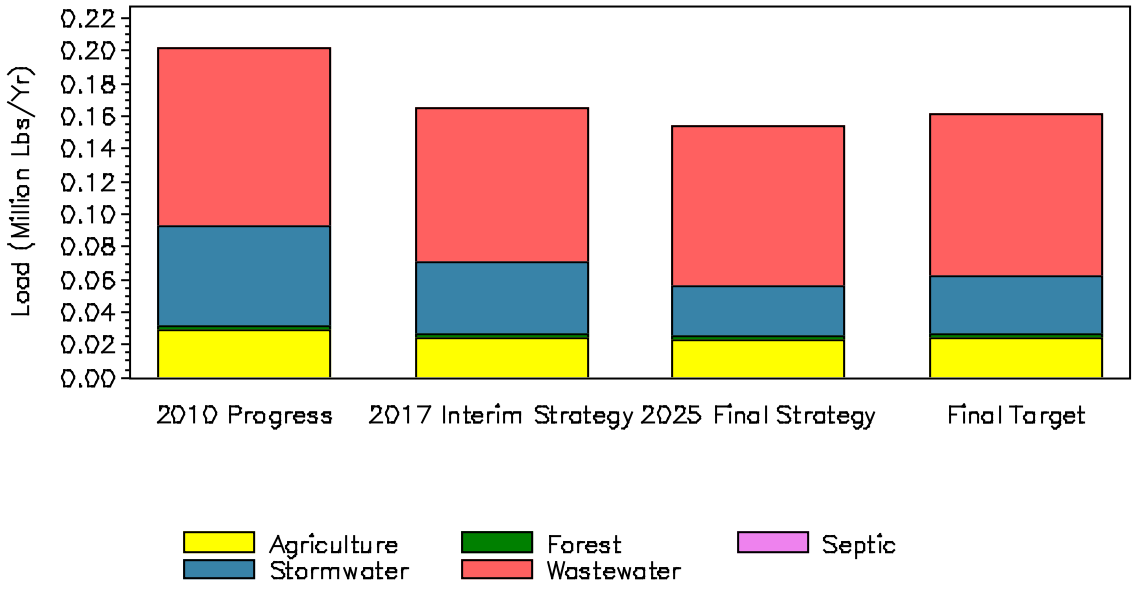
		2010 Progress	2017 Interim Strategy	2025 Final Strategy
Source Sector	**Landuse**	**Million Lbs/Yr**	**Million Lbs/Yr**	**Million Lbs/Yr**
Agriculture	AFO	0.081	0.082	0.082
	CAFO	0.007	0.007	0.007
	Crop	17.797	13.763	13.528
	Nursery	0.493	0.432	0.425
	Pasture	1.089	0.967	0.944
	Subtotal	***19.467***	***15.251***	***14.985***
Forest	Harvested	0.204	0.213	0.213
	Natural	3.949	4.073	4.094
	Subtotal	***4.153***	***4.286***	***4.307***
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	5.588	5.932	5.879
	Extractive	1.000	1.000	0.756
	Regulated Developed	50.092	19.897	1.440
	Subtotal	***56.680***	***26.829***	***8.075***
Wastewater	CSO	0.000	0.000	0.000
	Industrial	0.419	0.465	0.414
	Municipal	0.954	5.375	6.035
	Subtotal	***1.373***	***5.840***	***6.449***
	Total	***81.673***	***52.205***	***33.816***

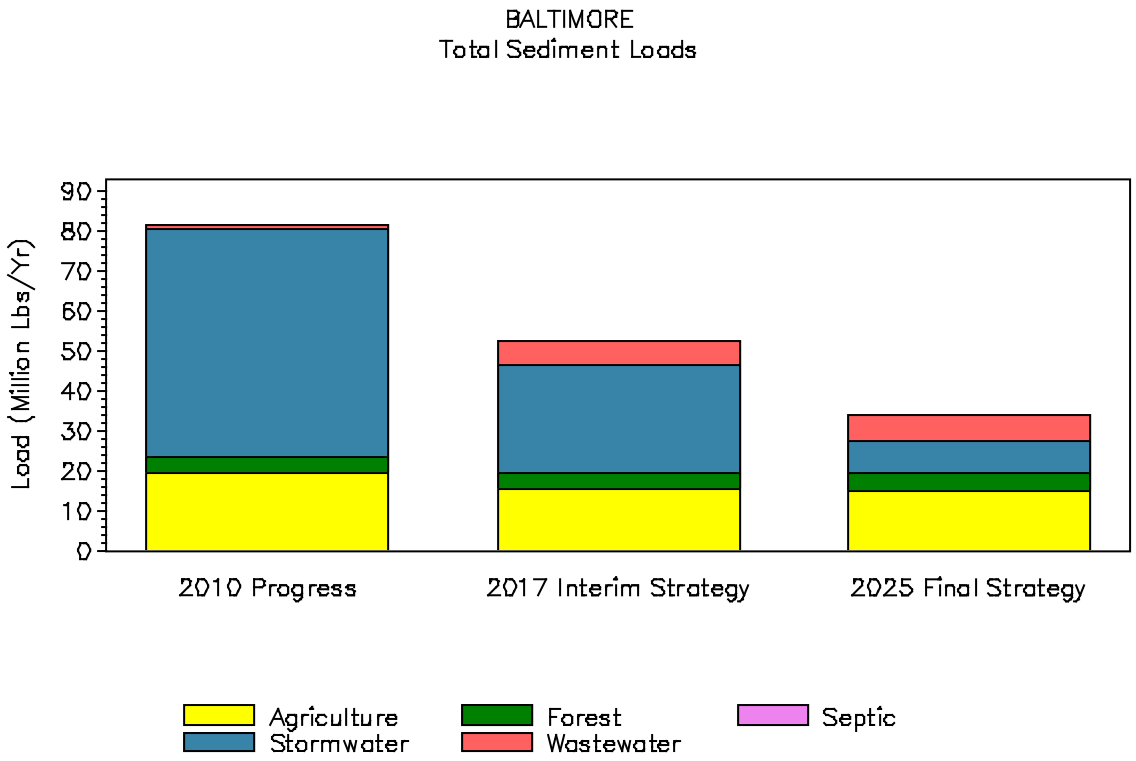
• The State did not distribute EPA's state and basin targets at the county or sector scale for sediment. Hence a Final Target column is not shown.

BALTIMORE
Total Nitrogen Loads



BALTIMORE
Total Phosphorus 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

BALTIMORE
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**							
Bioretention / Raingardens	Acres	0	327	327	511	511	0	0
Bioswale	Acres	0	1,638	1,638	655	655	0	-0
Dry Detention Ponds and Hydrodynamic Structures	Acres	7,976	7,976	7,977	13,037	13,037	1	0
Dry Extended Detention Ponds	Acres	1,595	1,739	1,739	8,731	8,731	0	0
Impervious Urban Surface Reduction	Acres	0	0	0	0	476	0	476
MS4 Permit Stormwater Retrofit	Acres	11,443	20,588	20,589	24,039	24,024	1	-15
Stormwater Management Generic BMP (1985 to 2002)	Acres	1,735	2,549	2,549	1,050	1,050	0	0
Stormwater Management Generic BMP (2002 to 2010)	Acres	6,109	6,154	6,154	1,003	1,003	0	-0
Urban Filtering Practices	Acres	61	3,463	3,463	20,605	23,739	0	3,134
Urban Forest Buffers	Acres	21	183	183	204	525	0	320
Urban Infiltration Practices	Acres	276	420	420	1,407	1,407	0	-0
Urban Tree Planting / Urban Tree Canopy	Acres	0	1,740	1,740	2,144	2,144	0	-0
Vegetated Open Channels	Acres	0	889	889	848	848	0	0
Wet Ponds and Wetlands	Acres	1,442	1,909	1,909	4,689	4,689	0	-0
Erosion and Sediment Control on Construction	Acres/Year	1,747	1,747	1,747	1,747	1,747	0	0
Erosion and Sediment Control on Extractive	Acres/Year	0	0	0	461	461	0	0
Forest Conservation	Acres/Year	7,548	7,468	7,468	7,471	7,471	0	-0
Urban Nutrient Management	Acres/Year	25,083	98,747	98,758	96,094	98,001	12	1,907
Street Sweeping Pounds	Lbs/Year	0	13,310,417	3,584,417	3,584,417	3,584,417	-9,726,000	0
Urban Stream Restoration (interim)	Linear Feet	0	239,274	239,274	442,000	442,000	0	0
Urban Stream Restoration / Shoreline Erosion Control	Linear Feet	0	6,478	6,478	58,849	58,849	0	0

• 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.

BALTIMORE
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 Connection	Critical Area	Systems	0	0	0	1,735	1,735	0	0
	Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	0	0	0	5,032	5,032	0	0
	Within 1000 ft of a perennial stream	Systems	0	0	0	3,094	3,094	0	0
	Septic ConnectionTotal		***0***	***0***	***0***	***9,861***	***9,861***	***0***	***0***
Septic Denitrification	Critical Area	Systems	7	7	1,323	109	109	1,316	0
	Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	91	91	91	47	47	0	0
	Within 1000 ft of a perennial stream	Systems	49	49	49	24	24	0	0
	Septic DenitrificationTotal		***147***	***147***	***1,463***	***181***	***181***	***1,316***	***0***
Septic Pumping	Critical Area	Systems	0	0	0	103	103	0	0
	Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	0	0	0	5,165	5,165	0	0
	Within 1000 ft of a perennial stream	Systems	0	0	0	2,692	2,692	0	0
	Septic PumpingTotal		***0***	***0***	***0***	***7,960***	***7,960***	***0***	***0***

• 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

BALTIMORE
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	0.017	0.017	0.017	0.017	0.017	0.019
	Extractive	0.004	0.004	0.004	0.003	0.003	0.003
	Regulated Developed	0.827	0.710	0.709	0.611	0.623	0.599
	Subtotal	***0.848***	***0.730***	***0.730***	***0.631***	***0.644***	***0.621***
Septic	Septic	0.167	0.167	0.156	0.106	0.107	0.106
	Subtotal	***0.167***	***0.167***	***0.156***	***0.106***	***0.107***	***0.106***

• 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.

BALTIMORE
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	0.003	0.003	0.003	0.003	0.003	0.003
	Extractive	0.001	0.001	0.001	0.001	0.001	0.001
	Regulated Developed	0.057	0.048	0.040	0.023	0.026	0.032
	Subtotal	***0.061***	***0.052***	***0.044***	***0.027***	***0.030***	***0.036***
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.

BALTIMORE
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	5.588	5.588	5.932	5.588	5.879
	Extractive	1.000	1.000	1.000	0.728	0.756
	Regulated Developed	50.092	36.458	19.897	0.586	1.440
	Subtotal	***56.680***	***43.047***	***26.829***	***6.902***	***8.075***
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.