Maryland Phase II WIP Strategies

FREDERICK
Agriculture - Annual Practices

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	**Unit**			
Conservation Tillage	Acres/Year	51,152	48,296	48,296
Cover Crop	Acres/Year	17,667	37,367	38,001
Cropland Irrigation Management	Acres/Year	0	500	500
Dairy Manure Incorporation	Acres/Year	0	1,340	2,233
Nutrient Management (All forms)	Acres/Year	79,419	146,870	151,307
Poultry Litter Incorporation	Acres/Year	0	17	34
Soil Conservation and Water Quality Plans	Acres/Year	57,478	108,524	121,104

• 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)

FREDERICK
Agriculture - Additional BMPs

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	**Unit**			
Alternative Crops	Acres	0	18	30
Barnyard Runoff Control	Acres	128	251	334
Forest Buffers	Acres	3,162	3,262	3,328
Grass Buffers / Vegetated Open Channel	Acres	1,207	1,305	1,369
Heavy Use Poultry Area Concrete Pads	Acres	0	1	0
Horse Pasture Management	Acres	0	34	57
Irrigation Water Capture Reuse	Acres	0	15	25
Land Retirement	Acres	2,971	3,252	3,900
Loafing Lot Management	Acres	0	29	0
Off Stream Watering Without Fencing	Acres	2,368	3,689	4,567
Precision Intensive Rotational Grazing	Acres	0	810	1,351
Prescribed Grazing	Acres	275	721	1,200
Stream Access Control with Fencing	Acres	102	143	143
Tree Planting / Vegetative Environmental Buffers	Acres	1,154	1,154	1,154
Wetland Restoration	Acres	86	86	86
Non Urban Stream Restoration / Shoreline Erosion Control	Linear Feet	0	744	1,240

• 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.

FREDERICK
Forest BMPs

			2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	**Zone**	**Unit**			
Forest Harvesting Practices	harvested forest	Acres	1,315	1,315	1,315

• 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)

FREDERICK
Developed Land BMPs

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	**Unit**			
Bioretention / Raingardens	Acres	0	11	10
Bioswale	Acres	0	51	138
Dry Detention Ponds and Hydrodynamic Structures	Acres	3,588	3,644	3,601
Dry Extended Detention Ponds	Acres	4,578	4,317	4,279
Impervious Urban Surface Reduction	Acres	0	525	765
MS4 Permit Stormwater Retrofit	Acres	3,220	3,259	3,310
Stormwater Management Generic BMP (1985 to 2002)	Acres	13,739	13,156	13,032
Stormwater Management Generic BMP (2002 to 2010)	Acres	2,748	2,878	2,838
Urban Filtering Practices	Acres	335	7,326	13,205
Urban Forest Buffers	Acres	33	719	1,229
Urban Infiltration Practices	Acres	1,434	1,431	1,451
Urban Tree Planting / Urban Tree Canopy	Acres	0	316	674
Vegetated Open Channels	Acres	0	803	761
Wet Ponds and Wetlands	Acres	5,265	5,226	5,169
Erosion and Sediment Control on Construction	Acres/Year	1,749	1,749	1,749
Erosion and Sediment Control on Extractive	Acres/Year	0	0	262
Forest Conservation	Acres/Year	1,827	2,138	2,143
Urban Nutrient Management	Acres/Year	13,795	35,988	25,197
Street Sweeping Pounds	Lbs/Year	0	721,346	721,346
Urban Stream Restoration / Shoreline Erosion Control	Linear Feet	0	4,535	7,595

• 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)

FREDERICK
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	25	25	25
	Within 1000 ft of a perennial stream	Systems	22	22	13,784
	Septic DenitrificationTotal		***47***	***47***	***13,808***

• 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

FREDERICK
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	0.060	0.016	0.016	0.041
	CAFO	0.002	0.002	0.002	0.002
	Crop	2.309	2.019	1.963	2.092
	Nursery	0.064	0.058	0.056	0.062
	Pasture	0.230	0.212	0.210	0.201
	Subtotal	***2.664***	***2.307***	***2.247***	***2.398***
Forest	Harvested	0.023	0.023	0.023	0.030
	Natural	0.461	0.473	0.476	0.459
	Subtotal	***0.483***	***0.496***	***0.499***	***0.490***
Non-Tidal Atm	Non-Tidal Atm	0.024	0.024	0.024	0.024
	Subtotal	***0.024***	***0.024***	***0.024***	***0.024***
Septic	Septic	0.163	0.163	0.123	0.124
	Subtotal	***0.163***	***0.163***	***0.123***	***0.124***
Stormwater	CSS	0.000	0.000	0.000	0
	Construction	0.044	0.044	0.044	0.052
	Extractive	0.012	0.012	0.011	0.011
	Regulated Developed	0.854	0.765	0.747	0.769
	Subtotal	***0.910***	***0.822***	***0.802***	***0.832***
Wastewater	CSO	0.000	0.000	0.000	0
	Industrial	0.017	0.014	0.013	0.013
	Municipal	0.228	0.168	0.279	0.278
	Subtotal	***0.245***	***0.182***	***0.293***	***0.291***
	Total	***4.489***	***3.994***	***3.988***	***4.159***

• 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.

FREDERICK
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	0.010	0.003	0.003	0.007
	CAFO	0.000	0.000	0.000	0.000
	Crop	0.118	0.108	0.106	0.105
	Nursery	0.018	0.016	0.015	0.017
	Pasture	0.028	0.024	0.024	0.023
	Subtotal	***0.174***	***0.150***	***0.148***	***0.153***
Forest	Harvested	0.001	0.001	0.001	0.001
	Natural	0.012	0.013	0.013	0.012
	Subtotal	***0.013***	***0.013***	***0.013***	***0.013***
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	0.005	0.005	0.005	0.007
	Extractive	0.002	0.002	0.002	0.001
	Regulated Developed	0.042	0.037	0.036	0.034
	Subtotal	***0.049***	***0.045***	***0.043***	***0.043***
Wastewater	CSO	0.000	0.000	0.000	0
	Industrial	0.002	0.001	0.001	0.001
	Municipal	0.020	0.017	0.022	0.020
	Subtotal	***0.022***	***0.018***	***0.022***	***0.021***
	Total	***0.259***	***0.227***	***0.227***	***0.230***

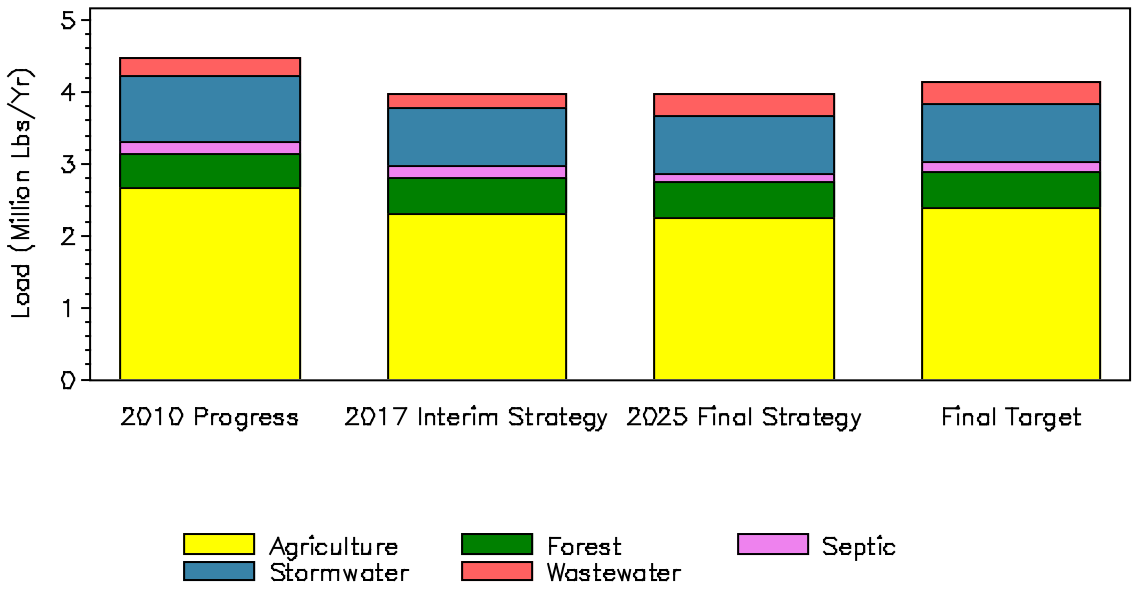
• The agricultural sector strategies were set to meet basin targets rather than county targets. Therefore, agricultural strategies are likely to overshoot or undershoot county targets, which can be reflected in the total countywide target results.
• Stormwater sector strategies may overshoot the county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

FREDERICK
Total Sediment Loads

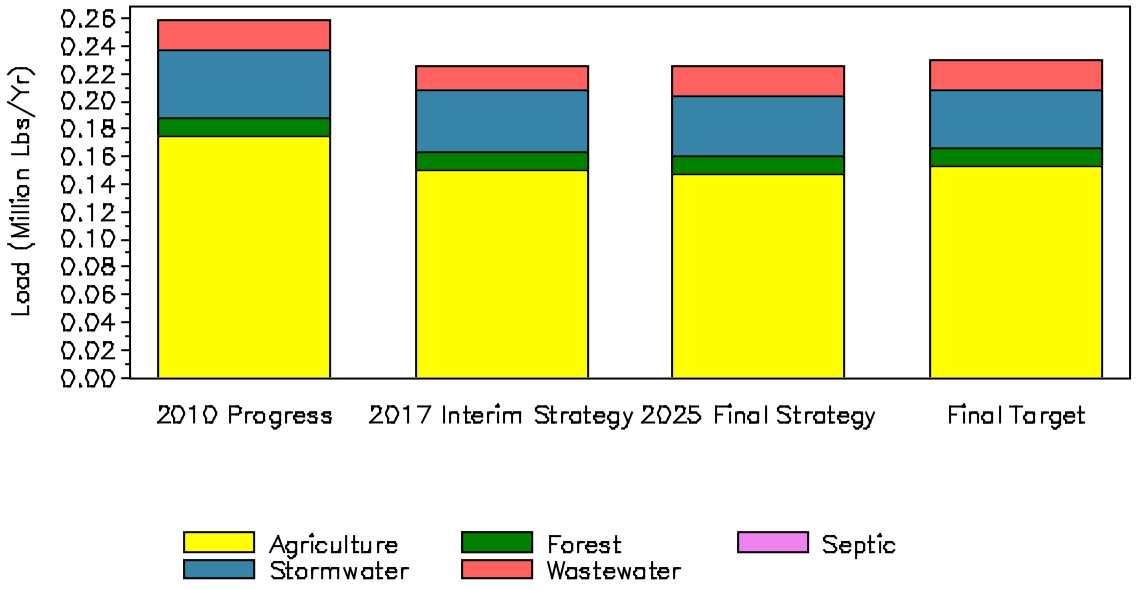
		2010 Progress	2017 Interim Strategy	2025 Final Strategy
Source Sector	**Landuse**	**Million Lbs/Yr**	**Million Lbs/Yr**	**Million Lbs/Yr**
Agriculture	AFO	0.713	0.576	0.520
	CAFO	0.111	0.089	0.081
	Crop	159.816	151.017	147.674
	Nursery	0.913	0.772	0.756
	Pasture	12.101	10.706	10.651
	Subtotal	***173.654***	***163.161***	***159.681***
Forest	Harvested	0.550	0.577	0.577
	Natural	8.845	9.084	9.134
	Subtotal	***9.395***	***9.661***	***9.711***
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	5.807	5.893	5.893
	Extractive	1.624	1.624	1.384
	Regulated Developed	24.327	21.268	19.405
	Subtotal	***31.759***	***28.785***	***26.682***
Wastewater	CSO	0.000	0.000	0.000
	Industrial	0.049	0.100	0.100
	Municipal	0.142	1.126	1.967
	Subtotal	***0.191***	***1.225***	***2.067***
	Total	***214.999***	***202.832***	***198.142***

• 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.

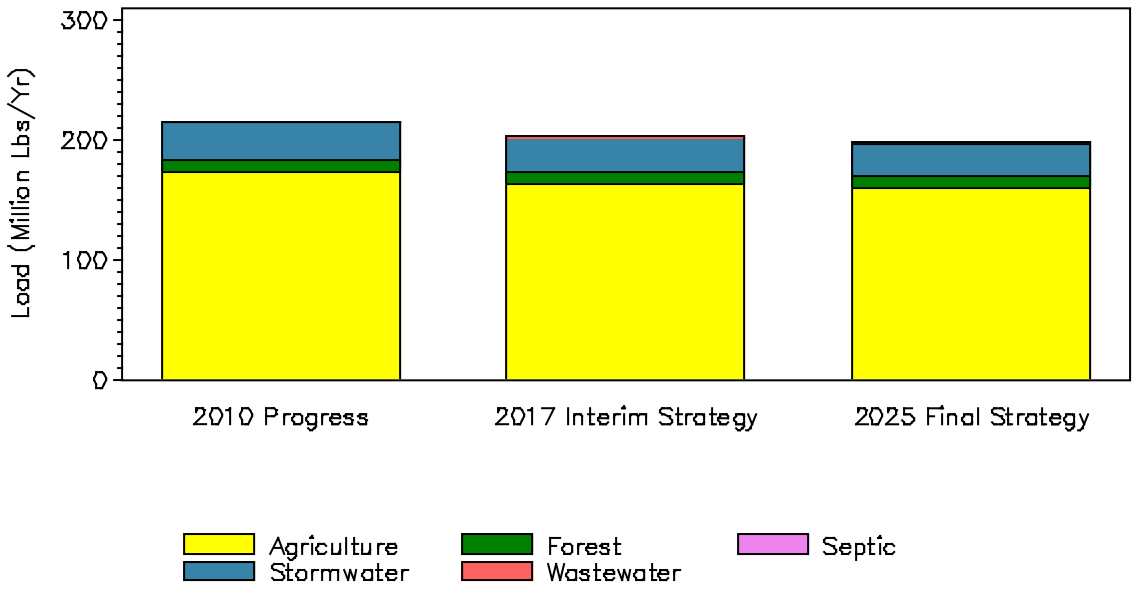
FREDERICK
Total Nitrogen Loads



FREDERICK
Total Phosphorus Loads



FREDERICK
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

FREDERICK
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	11	11	10	10	0	-0
Bioswale	Acres	0	51	51	138	138	0	-0
Dry Detention Ponds and Hydrodynamic Structures	Acres	3,588	3,674	3,644	3,651	3,601	-30	-51
Dry Extended Detention Ponds	Acres	4,578	4,355	4,317	4,344	4,279	-38	-65
Impervious Urban Surface Reduction	Acres	0	0	525	0	765	525	765
MS4 Permit Stormwater Retrofit	Acres	3,220	3,286	3,259	3,355	3,310	-27	-45
Stormwater Management Generic BMP (1985 to 2002)	Acres	13,739	13,270	13,156	13,226	13,032	-114	-194
Stormwater Management Generic BMP (2002 to 2010)	Acres	2,748	2,899	2,878	2,877	2,838	-21	-39
Urban Filtering Practices	Acres	335	377	7,326	392	13,205	6,949	12,813
Urban Forest Buffers	Acres	33	32	719	32	1,229	686	1,197
Urban Infiltration Practices	Acres	1,434	1,443	1,431	1,471	1,451	-12	-20
Urban Tree Planting / Urban Tree Canopy	Acres	0	316	316	674	674	0	-0
Vegetated Open Channels	Acres	0	803	803	761	761	0	0
Wet Ponds and Wetlands	Acres	5,265	5,269	5,226	5,243	5,169	-44	-74
Erosion and Sediment Control on Construction	Acres/Year	1,749	1,749	1,749	1,749	1,749	0	0
Erosion and Sediment Control on Extractive	Acres/Year	0	0	0	0	262	0	262
Forest Conservation	Acres/Year	1,827	2,123	2,138	2,123	2,143	14	20
Urban Nutrient Management	Acres/Year	13,795	12,691	35,988	12,691	25,197	23,296	12,505
Street Sweeping Pounds	Lbs/Year	0	721,346	721,346	721,346	721,346	0	-0
Urban Stream Restoration / Shoreline Erosion Control	Linear Feet	0	4,535	4,535	7,595	7,595	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.

FREDERICK
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	25	25	25	25	25	0	0
	Within 1000 ft of a perennial stream	Systems	22	22	22	22	13,784	0	13,762
	Septic DenitrificationTotal		***47***	***47***	***47***	***47***	***13,808***	***0***	***13,762***

• 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

FREDERICK
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	0.044	0.044	0.044	0.044	0.044	0.052
	Extractive	0.012	0.012	0.012	0.012	0.011	0.011
	Regulated Developed	0.854	0.844	0.765	0.836	0.747	0.769
	Subtotal	***0.910***	***0.901***	***0.822***	***0.893***	***0.802***	***0.832***
Septic	Septic	0.163	0.163	0.163	0.163	0.123	0.124
	Subtotal	***0.163***	***0.163***	***0.163***	***0.163***	***0.123***	***0.124***

• 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.

FREDERICK
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	0.005	0.005	0.005	0.005	0.005	0.007
	Extractive	0.002	0.002	0.002	0.002	0.002	0.001
	Regulated Developed	0.042	0.042	0.037	0.041	0.036	0.034
	Subtotal	***0.049***	***0.049***	***0.045***	***0.048***	***0.043***	***0.043***
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.

FREDERICK
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	5.807	5.807	5.893	5.807	5.893
	Extractive	1.624	1.624	1.624	1.624	1.384
	Regulated Developed	24.327	23.420	21.268	23.023	19.405
	Subtotal	***31.759***	***30.852***	***28.785***	***30.454***	***26.682***
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.