

Maryland Phase II WIP Strategies

ANNE ARUNDEL Agriculture - Annual Practices

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	Unit			
Conservation Tillage	Acres/Year	4,403	3,969	3,969
Cover Crop	Acres/Year	768	2,912	2,961
Cropland Irrigation Management	Acres/Year	0	342	342
Nutrient Management (All forms)	Acres/Year	9,735	15,852	14,965
Poultry Litter Incorporation	Acres/Year	0	359	600
Soil Conservation and Water Quality Plans	Acres/Year	12,150	15,056	16,800

- 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)

ANNE ARUNDEL Agriculture - Additional BMPs

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	Unit			
Barnyard Runoff Control	Acres	21	36	39
Forest Buffers	Acres	93	111	123
Grass Buffers / Vegetated Open Channel	Acres	79	101	116
Horse Pasture Management	Acres	0	485	809
Irrigation Water Capture Reuse	Acres	0	9	15
Land Retirement	Acres	175	1,710	2,751
Loafing Lot Management	Acres	0	2	0
Off Stream Watering Without Fencing	Acres	1,183	1,249	1,293
Prescribed Grazing	Acres	0	300	500
Stream Access Control with Fencing	Acres	9	9	9
Tree Planting / Vegetative Environmental Buffers	Acres	1,046	1,046	1,046
Wetland Restoration	Acres	14	14	14
Non Urban Stream Restoration / Shoreline Erosion Control	Linear Feet	0	1,584	2,640

- 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.

**ANNE ARUNDEL
Forest BMPs**

			2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	Zone	Unit			
Forest Harvesting Practices	harvested forest	Acres	1,018	1,018	1,018

- 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)

**ANNE ARUNDEL
Developed Land BMPs**

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	Unit			
Bioretention / Raingardens	Acres	0	10	9
Bioswale	Acres	0	2,530	1,238
Dry Detention Ponds and Hydrodynamic Structures	Acres	5,480	10,869	10,818
Dry Extended Detention Ponds	Acres	4,899	1,354	1,351
Impervious Urban Surface Reduction	Acres	0	417	3,031
MS4 Permit Stormwater Retrofit	Acres	4,679	1,457	1,528
Stormwater Management Generic BMP (1985 to 2002)	Acres	0	6,289	3,402
Stormwater Management Generic BMP (2002 to 2010)	Acres	1,420	710	694
Urban Filtering Practices	Acres	824	19,629	55,850
Urban Forest Buffers	Acres	89	172	1,546
Urban Infiltration Practices	Acres	5,062	6,925	6,933
Urban Tree Planting / Urban Tree Canopy	Acres	0	642	1,218
Vegetated Open Channels	Acres	0	732	699
Wet Ponds and Wetlands	Acres	8,220	10,971	10,923
Erosion and Sediment Control on Construction	Acres/Year	594	594	476
Erosion and Sediment Control on Extractive	Acres/Year	0	0	269
Forest Conservation	Acres/Year	3,322	1,123	1,122
Street Sweeping Mechanical Monthly	Acres/Year	0	5,631	5,631
Urban Nutrient Management	Acres/Year	20,523	5,639	13,915
Street Sweeping Pounds	Lbs/Year	0	851,944	851,944
Urban Stream Restoration (interim)	Linear Feet	0	154,704	309,408
Urban Stream Restoration / Shoreline Erosion Control	Linear Feet	0	5,356	8,970

- 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)

ANNE ARUNDEL Septic System BMPs

			2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	Zone	Unit			
Septic Connection	Critical Area	Systems	14	481	9,594
	Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	6	108	2,142
	Within 1000 ft of a perennial stream	Systems	23	334	6,660
	<i>Septic ConnectionTotal</i>		42	923	18,395
Septic Denitrification	Critical Area	Systems	61	2,097	1,043
	Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	25	716	719
	Within 1000 ft of a perennial stream	Systems	102	5,002	5,397
	<i>Septic DenitrificationTotal</i>		188	7,816	7,158

- 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

ANNE ARUNDEL 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	0.009	0.002	0.002	0.005
	CAFO	0.000	0.000	0.000	0.000
	Crop	0.139	0.104	0.093	0.085
	Nursery	0.012	0.011	0.010	0.011
	Pasture	0.020	0.022	0.023	0.016
	Subtotal		0.181	0.138	0.128
Forest	Harvested	0.011	0.011	0.011	0.011
	Natural	0.224	0.225	0.229	0.223
	Subtotal	0.234	0.236	0.239	0.234
Non-Tidal Atm	Non-Tidal Atm	0.020	0.020	0.020	0.020
	Subtotal	0.020	0.020	0.020	0.020
Septic	Septic	0.519	0.460	0.225	0.282
	Subtotal	0.519	0.460	0.225	0.282
Stormwater	CSS	0.000	0.000	0.000	0
	Construction	0.009	0.009	0.010	0.009
	Extractive	0.005	0.005	0.004	0.004
	Regulated Developed	0.894	0.807	0.629	0.636
	Subtotal	0.908	0.821	0.643	0.650
Wastewater	CSO	0.000	0.000	0.000	0.000
	Industrial	0.659	0.185	0.293	0.249
	Municipal	0.958	0.544	0.745	0.745
	Subtotal	1.617	0.730	1.038	0.994
Total		3.479	2.405	2.292	2.296

- 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.

**ANNE ARUNDEL
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	0.001	0.000	0.000	0.001
	CAFO	0.000	0.000	0.000	0.000
	Crop	0.011	0.009	0.009	0.009
	Nursery	0.005	0.005	0.004	0.005
	Pasture	0.003	0.003	0.003	0.002
	Subtotal		0.021	0.017	0.016
Forest	Harvested	0.000	0.000	0.000	0.000
	Natural	0.007	0.007	0.007	0.007
	Subtotal	0.007	0.007	0.007	0.007
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	0.002	0.002	0.002	0.002
	Extractive	0.001	0.001	0.001	0.001
	Regulated Developed	0.077	0.055	0.027	0.042
	Subtotal	0.080	0.058	0.031	0.045
Wastewater	CSO	0.000	0.000	0.000	0.000
	Industrial	0.033	0.005	0.006	0.005
	Municipal	0.071	0.041	0.057	0.057
	Subtotal	0.104	0.046	0.063	0.063
Total		0.213	0.129	0.119	0.133

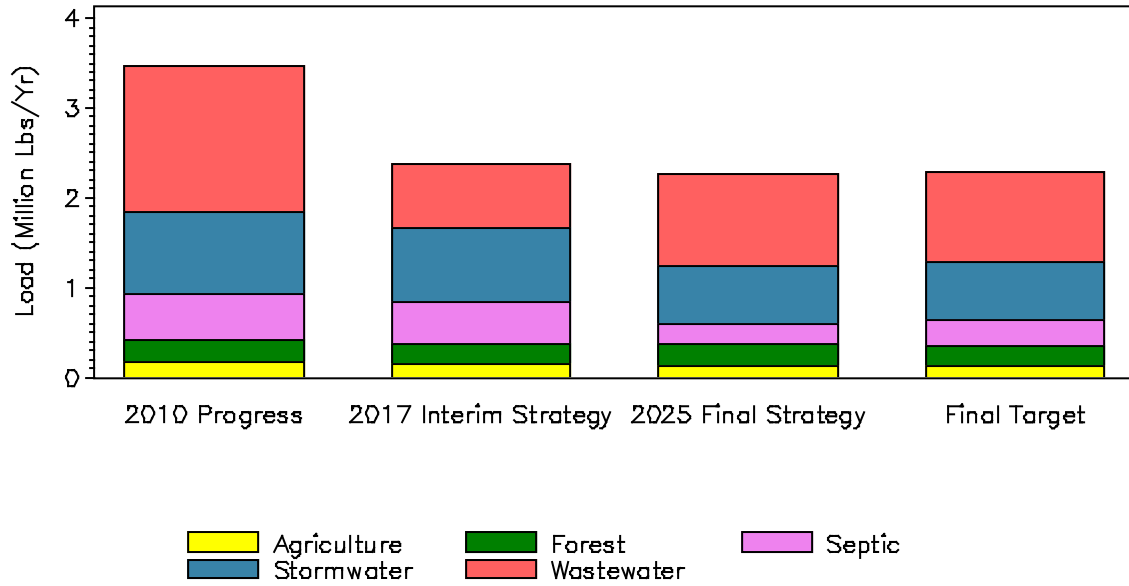
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**ANNE ARUNDEL
Total Sediment Loads**

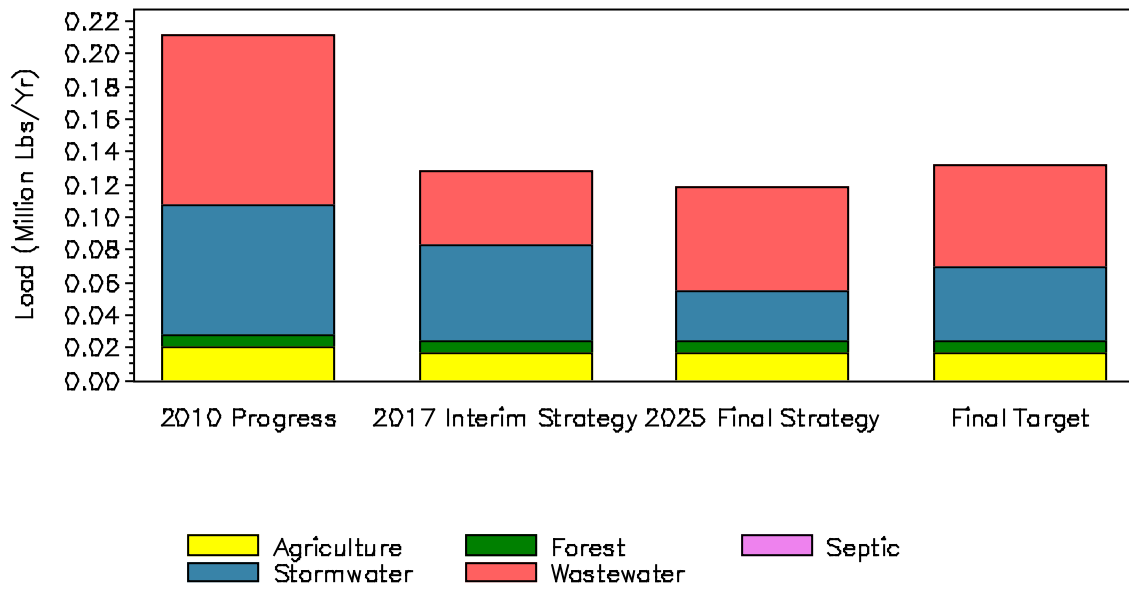
		2010 Progress	2017 Interim Strategy	2025 Final Strategy
Source Sector	Landuse	Million Lbs/Yr	Million Lbs/Yr	Million Lbs/Yr
Agriculture	AFO	0.011	0.009	0.009
	CAFO	0.000	0.000	0.000
	Crop	5.446	4.414	3.946
	Nursery	0.032	0.026	0.026
	Pasture	0.208	0.236	0.264
	Subtotal		5.698	4.686
Forest	Harvested	0.177	0.188	0.188
	Natural	3.565	3.587	3.642
	Subtotal	3.741	3.775	3.831
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	1.085	1.121	1.237
	Extractive	0.846	0.851	0.692
	Regulated Developed	21.872	3.155	1.028
	Subtotal	23.803	5.127	2.958
Wastewater	CSO	0.000	0.000	0.000
	Industrial	0.244	0.323	1.611
	Municipal	0.822	4.270	6.008
	Subtotal	1.066	4.593	7.618
	Total	34.309	18.181	18.652

• 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.

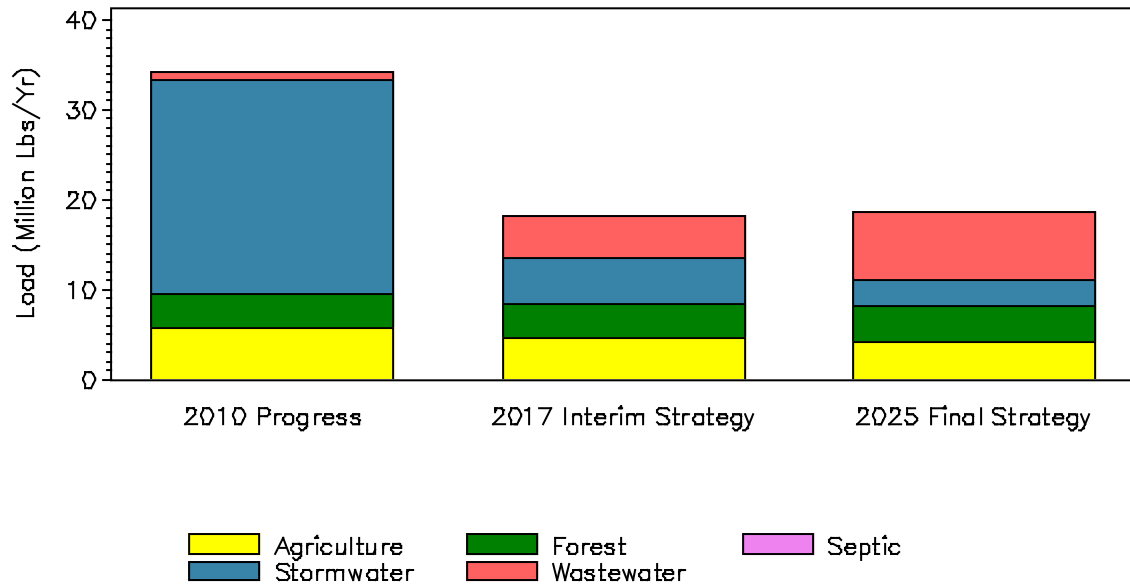
ANNE ARUNDEL
Total Nitrogen Loads



ANNE ARUNDEL
Total Phosphorus Loads



ANNE ARUNDEL
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

ANNE ARUNDEL 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	10	10	9	9	0	0
Bioswale	Acres	0	2,530	2,530	128	1,238	0	1,110
Dry Detention Ponds and Hydrodynamic Structures	Acres	5,480	9,571	10,869	9,514	10,818	1,298	1,304
Dry Extended Detention Ponds	Acres	4,899	194	1,354	185	1,351	1,160	1,166
Impervious Urban Surface Reduction	Acres	0	0	417	0	3,031	417	3,031
MS4 Permit Stormwater Retrofit	Acres	4,679	348	1,457	414	1,528	1,108	1,113
Stormwater Management Generic BMP (1985 to 2002)	Acres	0	6,289	6,289	732	3,402	0	2,671
Stormwater Management Generic BMP (2002 to 2010)	Acres	1,420	374	710	356	694	336	338
Urban Filtering Practices	Acres	824	18,018	19,629	38,510	55,850	1,612	17,339
Urban Forest Buffers	Acres	89	2	172	2	1,546	170	1,544
Urban Infiltration Practices	Acres	5,062	5,726	6,925	5,729	6,933	1,199	1,205
Urban Tree Planting / Urban Tree Canopy	Acres	0	642	642	1,218	1,218	0	-0
Vegetated Open Channels	Acres	0	732	732	699	699	0	-0
Wet Ponds and Wetlands	Acres	8,220	9,024	10,971	8,967	10,923	1,947	1,956
Erosion and Sediment Control on Construction	Acres/Year	594	0	594	0	476	594	476
Erosion and Sediment Control on Extractive	Acres/Year	0	0	0	0	269	0	269
Forest Conservation	Acres/Year	3,322	341	1,123	341	1,122	782	782
Street Sweeping Mechanical Monthly	Acres/Year	0	5,631	5,631	5,631	5,631	0	0
Urban Nutrient Management	Acres/Year	20,523	0	5,639	0	13,915	5,639	13,915
Street Sweeping Pounds	Lbs/Year	0	851,944	851,944	851,944	851,944	0	-0
Urban Stream Restoration (interim)	Linear Feet	0	154,704	154,704	309,408	309,408	0	0
Urban Stream Restoration / Shoreline Erosion Control	Linear Feet	0	5,356	5,356	8,970	8,970	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 intended 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 precedence 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.

**ANNE ARUNDEL
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	14	481	481	9,594	9,594	0	0
	Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	6	108	108	2,142	2,142	0	0
	Within 1000 ft of a perennial stream	Systems	23	334	334	6,660	6,660	0	0
	Septic ConnectionTotal		42	923	923	18,395	18,395	0	0
Septic Denitrification	Critical Area	Systems	61	2,097	2,097	1,043	1,043	0	0
	Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	25	716	716	719	719	0	0
	Within 1000 ft of a perennial stream	Systems	102	5,002	5,002	5,397	5,397	0	0
	Septic DenitrificationTotal		188	7,816	7,816	7,158	7,158	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

ANNE ARUNDEL 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	0.009	0.012	0.009	0.012	0.010	0.009
	Extractive	0.005	0.005	0.005	0.005	0.004	0.004
	Regulated Developed	0.894	0.806	0.807	0.697	0.629	0.636
	Subtotal	0.908	0.823	0.821	0.714	0.643	0.650
Septic	Septic	0.519	0.460	0.460	0.224	0.225	0.282
	Subtotal	0.519	0.460	0.460	0.224	0.225	0.282

- 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.

ANNE ARUNDEL 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	0.002	0.003	0.002	0.003	0.002	0.002
	Extractive	0.001	0.001	0.001	0.001	0.001	0.001
	Regulated Developed	0.077	0.055	0.055	0.036	0.027	0.042
	Subtotal	0.080	0.059	0.058	0.040	0.031	0.045
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.

**ANNE ARUNDEL
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	1.085	1.714	1.121	1.714	1.237
	Extractive	0.846	0.846	0.851	0.846	0.692
	Regulated Developed	21.872	6.264	3.155	6.075	1.028
	Subtotal	23.803	8.824	5.127	8.635	2.958
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.