

## Maryland Phase II WIP Strategies

### CARROLL Agriculture - Annual Practices

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	Unit			
Conservation Tillage	Acres/Year	54,226	49,394	49,394
Cover Crop	Acres/Year	12,226	21,596	21,962
Cropland Irrigation Management	Acres/Year	0	1,535	1,535
Dairy Manure Incorporation	Acres/Year	0	2,400	4,000
Nutrient Management (All forms)	Acres/Year	58,726	103,329	105,987
Poultry Litter Incorporation	Acres/Year	0	365	597
Soil Conservation and Water Quality Plans	Acres/Year	60,931	89,930	100,343

- 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)

### CARROLL Agriculture - Additional BMPs

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	Unit			
Barnyard Runoff Control	Acres	116	214	234
Forest Buffers	Acres	1,653	1,792	1,885
Grass Buffers / Vegetated Open Channel	Acres	920	1,183	1,358
Heavy Use Poultry Area Concrete Pads	Acres	0	0	0
Irrigation Water Capture Reuse	Acres	0	36	60
Land Retirement	Acres	2,193	3,571	4,713
Loafing Lot Management	Acres	0	13	0
Off Stream Watering Without Fencing	Acres	7,341	7,461	7,541
Prescribed Grazing	Acres	226	900	1,500
Stream Access Control with Fencing	Acres	83	91	91
Tree Planting / Vegetative Environmental Buffers	Acres	623	623	623
Wetland Restoration	Acres	134	137	139
Non Urban Stream Restoration / Shoreline Erosion Control	Linear Feet	0	120	200

- 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.

**CARROLL  
Forest BMPs**

			<b>2010 Progress</b>	<b>2017 Interim Strategy</b>	<b>2025 Final Strategy</b>
<b>BMP Name</b>	<b>Zone</b>	<b>Unit</b>			
Forest Harvesting Practices	harvested forest	Acres	720	720	720

- 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)

**CARROLL  
Developed Land BMPs**

		<b>2010 Progress</b>	<b>2017 Interim Strategy</b>	<b>2025 Final Strategy</b>
<b>BMP Name</b>	<b>Unit</b>			
Bioretention / Raingardens	Acres	0	5	5
Bioswale	Acres	0	25	68
Dry Detention Ponds and Hydrodynamic Structures	Acres	2,277	2,342	2,313
Dry Extended Detention Ponds	Acres	1,036	1,075	1,061
Impervious Urban Surface Reduction	Acres	0	243	419
MS4 Permit Stormwater Retrofit	Acres	2,975	2,968	2,980
Stormwater Management Generic BMP (1985 to 2002)	Acres	11,226	10,921	10,813
Stormwater Management Generic BMP (2002 to 2010)	Acres	3,450	3,435	3,395
Urban Filtering Practices	Acres	353	8,463	15,259
Urban Forest Buffers	Acres	0	847	1,435
Urban Infiltration Practices	Acres	2,079	2,018	2,015
Urban Tree Planting / Urban Tree Canopy	Acres	0	156	333
Vegetated Open Channels	Acres	0	396	376
Wet Ponds and Wetlands	Acres	3,974	3,969	3,925
Erosion and Sediment Control on Construction	Acres/Year	1,709	1,709	1,709
Erosion and Sediment Control on Extractive	Acres/Year	0	0	106
Forest Conservation	Acres/Year	3,467	3,547	3,556
Urban Nutrient Management	Acres/Year	11,287	34,528	24,994
Street Sweeping Pounds	Lbs/Year	0	356,274	356,274
Urban Stream Restoration / Shoreline Erosion Control	Linear Feet	0	2,240	3,751

- 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)

## CARROLL 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	47	47	47
	Within 1000 ft of a perennial stream	Systems	26	26	10,580
	<b><i>Septic Denitrification Total</i></b>		<b>72</b>	<b>72</b>	<b>10,627</b>

- 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

### CARROLL 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	0.004	0.001	0.001	0.002
	CAFO	0.002	0.002	0.002	0.007
	Crop	0.664	0.583	0.561	0.608
	Nursery	0.043	0.038	0.037	0.041
	Pasture	0.043	0.040	0.040	0.039
	<b>Subtotal</b>		<b>0.756</b>	<b>0.665</b>	<b>0.641</b>
Forest	Harvested	0.004	0.004	0.004	0.005
	Natural	0.079	0.082	0.083	0.078
	<b>Subtotal</b>	<b>0.083</b>	<b>0.086</b>	<b>0.086</b>	<b>0.083</b>
Non-Tidal Atm	Non-Tidal Atm	0.001	0.001	0.001	0.001
	<b>Subtotal</b>	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>
Septic	Septic	0.030	0.030	0.023	0.024
	<b>Subtotal</b>	<b>0.030</b>	<b>0.030</b>	<b>0.023</b>	<b>0.024</b>
Stormwater	CSS	0.000	0.000	0.000	0
	Construction	0.008	0.008	0.008	0.009
	Extractive	0.002	0.002	0.002	0.002
	Regulated Developed	0.149	0.130	0.124	0.136
	<b>Subtotal</b>	<b>0.158</b>	<b>0.140</b>	<b>0.134</b>	<b>0.147</b>
Wastewater	CSO	0.000	0.000	0.000	0
	Industrial	0.007	0.004	0.004	0.004
	Municipal	0.047	0.032	0.030	0.030
	<b>Subtotal</b>	<b>0.054</b>	<b>0.036</b>	<b>0.035</b>	<b>0.035</b>
<b>Total</b>		<b>1.082</b>	<b>0.958</b>	<b>0.921</b>	<b>0.986</b>

- 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.

**CARROLL**  
**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	0.001	0.001	0.001	0.002
	Crop	0.060	0.054	0.053	0.050
	Nursery	0.022	0.018	0.017	0.020
	Pasture	0.009	0.008	0.008	0.008
	<b>Subtotal</b>		<b>0.092</b>	<b>0.082</b>	<b>0.080</b>
Forest	Harvested	0.000	0.000	0.000	0.000
	Natural	0.003	0.003	0.003	0.003
	<b>Subtotal</b>	<b>0.003</b>	<b>0.003</b>	<b>0.003</b>	<b>0.003</b>
Non-Tidal Atm	Non-Tidal Atm	0.000	0.000	0.000	0.000
	<b>Subtotal</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Septic	Septic	0.000	0.000	0.000	0.000
	<b>Subtotal</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Stormwater	CSS	0.000	0.000	0.000	0
	Construction	0.002	0.002	0.002	0.003
	Extractive	0.001	0.001	0.001	0.001
	Regulated Developed	0.014	0.012	0.011	0.011
	<b>Subtotal</b>	<b>0.016</b>	<b>0.015</b>	<b>0.014</b>	<b>0.014</b>
Wastewater	CSO	0.000	0.000	0.000	0
	Industrial	0.004	0.000	0.000	0.000
	Municipal	0.011	0.005	0.005	0.005
	<b>Subtotal</b>	<b>0.015</b>	<b>0.005</b>	<b>0.005</b>	<b>0.005</b>
<b>Total</b>		<b>0.127</b>	<b>0.105</b>	<b>0.102</b>	<b>0.103</b>

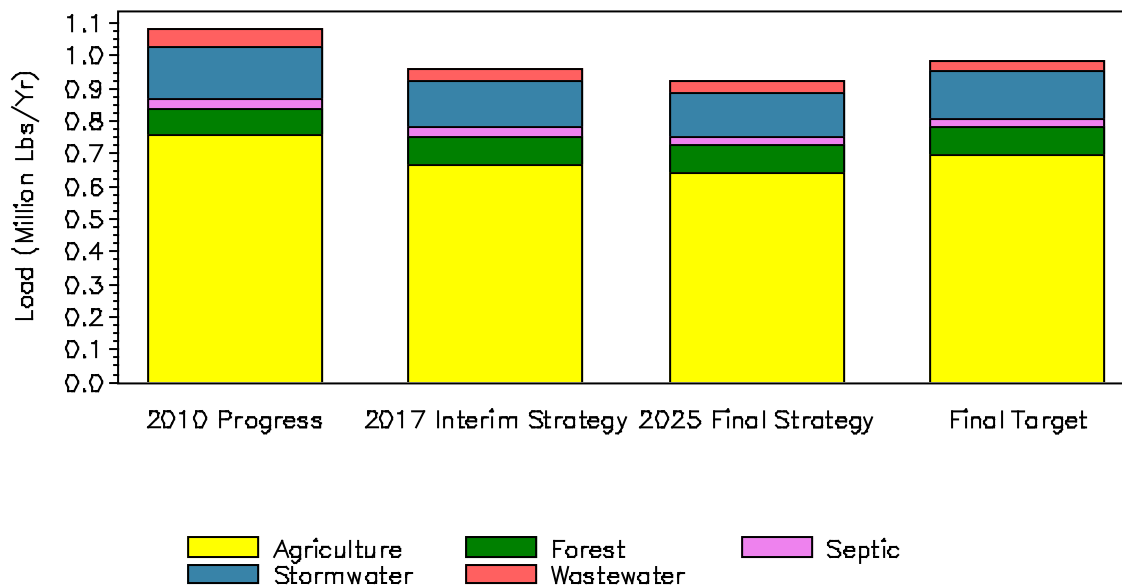
- The agricultural sector strategies were set to meet basin targets rather than county targets. Therefore, agricultural strategies are likely to overshoot or undershoot county targets, which can be reflected in the total countywide target results.
- Stormwater sector strategies may overshoot the county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

**CARROLL**  
**Total Sediment Loads**

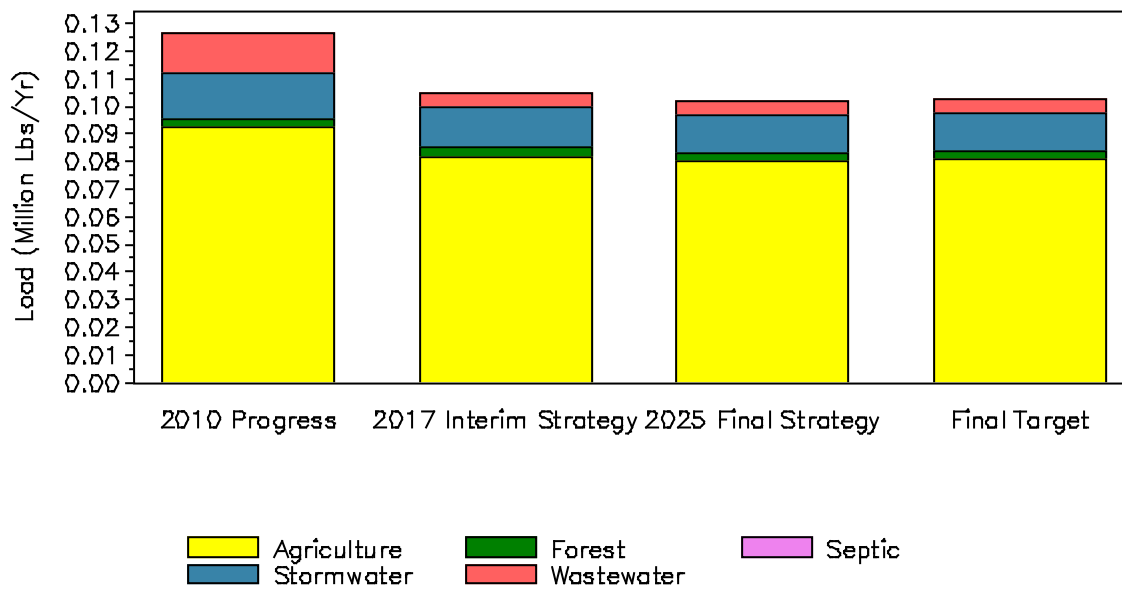
		2010 Progress	2017 Interim Strategy	2025 Final Strategy
Source Sector	Landuse	Million Lbs/Yr	Million Lbs/Yr	Million Lbs/Yr
Agriculture	AFO	0.172	0.141	0.138
	CAFO	0.047	0.038	0.037
	Crop	34.796	33.176	32.223
	Nursery	0.766	0.631	0.615
	Pasture	2.231	2.165	2.218
	<b>Subtotal</b>		<b>38.012</b>	<b>36.151</b>
Forest	Harvested	0.208	0.231	0.231
	Natural	4.775	4.976	5.015
	<b>Subtotal</b>	<b>4.983</b>	<b>5.207</b>	<b>5.246</b>
Non-Tidal Atm	Non-Tidal Atm	0.000	0.000	0.000
	<b>Subtotal</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Septic	Septic	0.000	0.000	0.000
	<b>Subtotal</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Stormwater	CSS	0.000	0.000	0.000
	Construction	3.538	3.617	3.617
	Extractive	0.991	0.991	0.852
	Regulated Developed	10.185	8.851	7.746
	<b>Subtotal</b>	<b>14.713</b>	<b>13.459</b>	<b>12.215</b>
Wastewater	CSO	0.000	0.000	0.000
	Industrial	0.036	0.045	0.045
	Municipal	0.106	0.544	0.615
	<b>Subtotal</b>	<b>0.142</b>	<b>0.589</b>	<b>0.660</b>
	<b>Total</b>	<b>57.850</b>	<b>55.406</b>	<b>53.354</b>

• 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.

CARROLL  
Total Nitrogen Loads

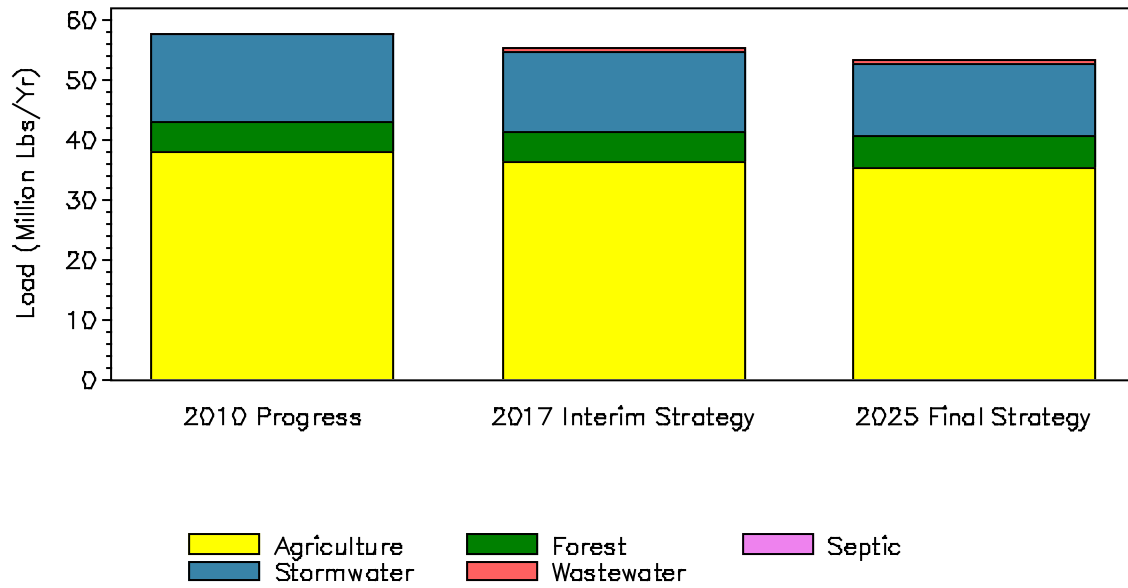


CARROLL  
Total Phosphorus Loads





CARROLL  
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

### CARROLL 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	5	5	5	5	0	0
Bioswale	Acres	0	25	25	68	68	0	0
Dry Detention Ponds and Hydrodynamic Structures	Acres	2,277	2,368	2,342	2,357	2,313	-26	-44
Dry Extended Detention Ponds	Acres	1,036	1,086	1,075	1,081	1,061	-12	-20
Impervious Urban Surface Reduction	Acres	0	0	243	0	419	243	419
MS4 Permit Stormwater Retrofit	Acres	2,975	3,003	2,968	3,037	2,980	-34	-57
Stormwater Management Generic BMP (1985 to 2002)	Acres	11,226	11,050	10,921	11,029	10,813	-129	-216
Stormwater Management Generic BMP (2002 to 2010)	Acres	3,450	3,473	3,435	3,462	3,395	-38	-66
Urban Filtering Practices	Acres	353	370	8,463	378	15,259	8,092	14,881
Urban Forest Buffers	Acres	0	1	847	1	1,435	846	1,434
Urban Infiltration Practices	Acres	2,079	2,042	2,018	2,055	2,015	-24	-40
Urban Tree Planting / Urban Tree Canopy	Acres	0	156	156	333	333	0	0
Vegetated Open Channels	Acres	0	396	396	376	376	0	0
Wet Ponds and Wetlands	Acres	3,974	4,015	3,969	4,002	3,925	-46	-76
Erosion and Sediment Control on Construction	Acres/Year	1,709	1,709	1,709	1,709	1,709	0	0
Erosion and Sediment Control on Extractive	Acres/Year	0	0	0	0	106	0	106
Forest Conservation	Acres/Year	3,467	3,533	3,547	3,533	3,556	14	23
Urban Nutrient Management	Acres/Year	11,287	10,822	34,528	10,822	24,994	23,707	14,172
Street Sweeping Pounds	Lbs/Year	0	356,274	356,274	356,274	356,274	0	-0
Urban Stream Restoration / Shoreline Erosion Control	Linear Feet	0	2,240	2,240	3,751	3,751	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.

## CARROLL 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	47	47	47	47	47	0	0
	Within 1000 ft of a perennial stream	Systems	26	26	26	26	10,580	0	10,554
<b>Septic DenitrificationTotal</b>			<b>72</b>	<b>72</b>	<b>72</b>	<b>72</b>	<b>10,627</b>	<b>0</b>	<b>10,554</b>

- 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

### CARROLL 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	0.008	0.008	0.008	0.008	0.008	0.009
	Extractive	0.002	0.002	0.002	0.002	0.002	0.002
	Regulated Developed	0.149	0.148	0.130	0.147	0.124	0.136
	<b>Subtotal</b>	<b>0.158</b>	<b>0.158</b>	<b>0.140</b>	<b>0.157</b>	<b>0.134</b>	<b>0.147</b>
Septic	Septic	0.030	0.030	0.030	0.030	0.023	0.024
	<b>Subtotal</b>	<b>0.030</b>	<b>0.030</b>	<b>0.030</b>	<b>0.030</b>	<b>0.023</b>	<b>0.024</b>

- 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.

### CARROLL 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	0.002	0.002	0.002	0.002	0.003
	Extractive	0.001	0.001	0.001	0.001	0.001	0.001
	Regulated Developed	0.014	0.014	0.012	0.013	0.011	0.011
	<b>Subtotal</b>	<b>0.016</b>	<b>0.016</b>	<b>0.015</b>	<b>0.016</b>	<b>0.014</b>	<b>0.014</b>
Septic	Septic	0.000	0	0.000	0	0.000	0.000
	<b>Subtotal</b>	<b>0.000</b>	<b>0</b>	<b>0.000</b>	<b>0</b>	<b>0.000</b>	<b>0.000</b>

- 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.

**CARROLL**  
**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	3.538	3.538	3.617	3.538	3.617
	Extractive	0.991	0.991	0.991	0.991	0.852
	Regulated Developed	10.185	9.931	8.851	9.823	7.746
	<b>Subtotal</b>	<b>14.713</b>	<b>14.459</b>	<b>13.459</b>	<b>14.351</b>	<b>12.215</b>
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Septic	Septic	0.000	0	0.000	0	0.000
	<b>Subtotal</b>	<b>0.000</b>	<b>0</b>	<b>0.000</b>	<b>0</b>	<b>0.000</b>
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- 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.