

Anacostia River Watershed Trash TMDL Implementation Strategy

Prepared by the District Department of Environment,

Stormwater Management Division

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In compliance with the District's most recent municipal separate storm sewer system (MS4) permit, promulgated on January 22, 2012, the District Department of the Environment (DDOE) has developed this implementation strategy and load reduction calculation methodology for presentation to the United States Environmental Protection Agency (EPA) Region III and local stakeholders. The goal of this document is to present the District's strategy for achieving the MS4 permit goal of putting the controls in place by 2017 to prevent 103,188 pounds of trash per year from reaching the District's portion of the Anacostia River.¹ This document serves as a briefing on the strategy and load reduction calculation methodology featured in the District's 2012 MS4 Annual Report submitted to EPA Region III on January 22, 2013.²

Background

In August 2010, the District, in partnership with Montgomery County, Prince George's County, the Maryland Department of Environment, and EPA Region III, established a total maximum daily load (TMDL) for trash for the Anacostia River. This was the first inter-jurisdictional TMDL for trash developed for a water body in the United States. The TMDL includes waste load allocations (WLAs) for both the District's combined sewer system (CSS) and MS4. The official TMDL document notes that the WLA for the CSS will be addressed by the long-term control plan (LTCP) currently being implemented by DC Water. The TMDL also states that WLA compliance for the MS4 will be accomplished via compliance with the District's MS4 permit.

In January 2012, EPA Region III issued the latest MS4 permit to the District. Section 4.3.5.4 of that permit requires the District to implement the necessary controls by 2017 to remove 103,188 pounds of trash annually, and Section 4.10 requires the District to submit a trash load reduction calculation methodology with the first annual report.

On January 22, 2013, DDOE submitted the first annual report to EPA under the new MS4 permit. This document is an abridged version of the section included in that report on the

¹ - For detailed information on trash reduction requirements under the MS4 permit, see Sections 4.3.5.4 and 4.10 of the District's MS4 permit promulgated on January 22, 2012. Go to: <http://tinyurl.com/ke48maa>

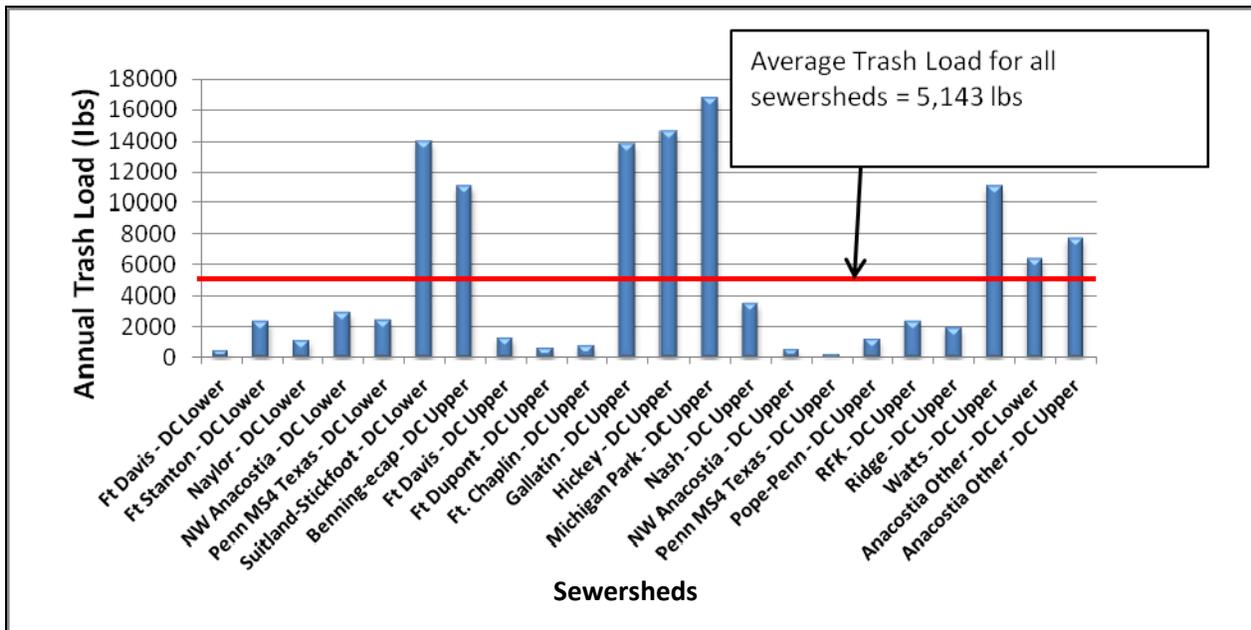
² - For a copy of the 2012 MS4 Annual Report, Go to: <http://tinyurl.com/o7hahgp>

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District’s strategy for meeting the trash reduction requirements. DDOE is disseminating this document for public review to gain input on the District’s approach to meeting the MS4 Permit goal.

The Implementation Strategy

As part of the baseline monitoring for the trash TMDL, trash-loading coefficients were developed for various land use types found in the District. Using the loading coefficients, total annual loads were developed for each of the MS4 sewersheds in the District’s portion of the Anacostia watershed. The average trash load for all Anacostia MS4 sewersheds was then determined. Sewersheds determined to have greater than average annual trash loads were designated as “hotspots.” These sewersheds have been identified as being top priorities for reducing trash loads. Since most of these sewersheds drain to two or more outfalls, they have been flagged as priorities for end-of-pipe retrofits (i.e., trash capture devices). DDOE currently estimates that if end-of-pipe best management practices (BMPs) were placed at all MS4 hotspot outfalls, 43,000 to 45,000 pounds of trash per year could be prevented from reaching the Anacostia River and its tributaries. These numbers were calculated based on observed efficiencies for Bandalong litter traps and custom-designed devices.



This figure displays the estimated trash load for each sewershed in the District’s portion of the Anacostia watershed, as well as the average trash load per sewershed. Six of the sewersheds have been slated as hotspots.

Not all outfalls are suitable for installation of BMPs. Issues such as access and stability of the outfall affects the feasibility of installing various devices. So, the District is taking a multi-pronged approach to reducing trash from sewersheds that cannot be retrofitted with end-of-pipe

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BMPs. The following is a full list of structural and non-structural controls the District will utilize to meet its MS4 permit requirements:

1. In-stream and end-of-pipe best management practices (e.g., trash traps)
2. Skimmer boat activities
3. Stream and river cleanup activities
4. Roadway and block cleanup activities
5. Street sweeping of environmental hotspots
6. Education and outreach
7. Regulatory approaches (e.g., Bag Law)

All of these BMPs were deemed acceptable to help meet the MS4 permit goal to remove 103,188 pounds of trash per year by EPA Region III. The District will track and report implementation annually, and DDOE will report on new practices along with their respective load reduction calculation methodologies as they are implemented. DDOE will continue to collect empirical data on all end-of-pipe BMPs and adjust efficiencies for future TMDL planning purposes. DDOE will strive to install as many end-of-pipe BMPs as possible over the next five years.

Load Reduction Calculation Methodology

The 2012 annual accounting table for load reductions is displayed on the following page. DDOE plans to update and include this table in all MS4 Annual Reports submitted to EPA. A calculation methodology for each activity category is stated in column five of the table.

For some of the practices, the collected empirical data was counted towards meeting load reductions. For other practices, best professional judgment was applied to assess reductions. These factors helped eliminate variables which could cause overestimates of efficiency.

For example, using GIS, DDOE estimates that the District Department of Public Works (DPW) currently sweeps 580 acres of roadway in the environmental hotspots. Because these areas are mostly “unsigned,” we only count 50% of that area as being swept. This is due to the fact that cars may be parked along the street in unsigned areas. We then multiply the total area swept, or 290 acres, by the Anacostia Trash TMDL loading coefficient for roadways which is 31.12 lbs per acre. That equates to 9,048 lbs. We then multiply that by 16, since DPW sweeps hotspots twice per month, 8 months out of the year. That total is then multiplied by 50% since not all of these areas may be swept at once. The total trash load reduction we then take credit for is 72,382 lbs per year.

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Activity Category	Activity	Total Amount of Trash Actually Being Removed (pounds)	Annual Load Reduction Counted (pounds)	Calculation Methodology
Trash Traps	Marvin Gaye Park Bandalong	2,606	52	Based on empirical data collected between December 2011 & December 2012. The total amount of trash collected during this time period is multiplied by 2% since that is the approximate proportion of the Watts Branch watershed which lies within District and drains to the trash trap.
	Kenilworth Bandalong	2,255	2,255	Data for the lower Watts Branch Bandalong was collected between January and December 2012. No reduction factors are being applied since the entire drainage area above this trap lies within the District.
	Nash Run Trash Trap	1,894	1,420	Based on the annual average (2009–2012) total mass collected. The total amount collected is then multiplied by 75% since that is the approximate proportion of the Nash Run watershed that lies within the District and drains to the trash trap.
	Hickey Run BMP	10,000	2,000	Based on assumed efficiency of 100 percent design capture of device. A reduction factor of 20 percent was applied since glass and plastic bottles may not have been emptied of water.
	James Creek Bandalong	327	327	Based on empirical data collected. No reduction factors have been applied since the entire drainage area for this practice lies within the District.
Roadway and Block Cleanups	Adopt-A-Block Program	NA	NA	Collaborating with Office of the Clean City to collect empirical cleanup data.

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Activity Category	Activity	Total Amount of Trash Actually Being Removed (pounds)	Annual Load Reduction Counted (pounds)	Calculation Methodology
Sweeping Environmental Hotspots	Sweeping Environmental Hotspots	144,768	72,384	<p>The total area of roadways within the environmental hotspots (e.g. blocks found to contain high trash amounts)³ was calculated. That area was then multiplied by 50% because roughly half of the roadway (the middle of the road) is swept in these areas because they are unsigned. That area is then multiplied by the trash loading coefficient of 31.12 lbs/acre developed for the TMDL. That total mass in pounds is then multiplied by 16 since the DC Department of Public Works (DPW) is supposed to sweep environmental hotspots (i.e. blocks with high amounts of trash) twice per month, 8 months out of the year. That result is then multiplied by 50% because not all hotspots may always be swept.</p>
Clean-Up Activities	Clean-Up Events	37,647	631	<p>Based on empirical data collected during the 2012 Anacostia Watershed Society Earth Day Clean-Up. A reduction factor of 16.5% is applied since this the proportion of the Anacostia watershed which lies within the District. A second reduction factor of 50.8 % is applied to account for the District's portion of the Anacostia served by the MS4. A third reduction factor of 20% is applied to account for the fact that not all plastic and glass bottles collected may have been emptied of water before bagged.</p>
	Skimmer Boats	700,000	5,877	<p>Total amount of trash and debris removed was multiplied by 16.5 %, which represents the proportion of the watershed that lies within the District. A second reduction factor of 50.8 % was applied to account for the area of the District's portion of the watershed served by the MS4. A third reduction factor of 50 % was applied since not all material collected by the skimmer boats may have been trash. Finally, a fourth reduction factor of 20 percent was applied since not all plastic and glass bottles collected were emptied of water.</p>

³ - The environmental hotspots which are swept differ from the "hotspot" sewersheds mentioned earlier. The environmental hotspots swept represent a series of blocks found to contain very high amounts of trash.

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Activity Category	Activity	Total Amount of Trash Actually Being Removed (pounds)	Annual Load Reduction Counted (pounds)	Calculation Methodology
Education and Outreach	Watershed Wide Anacostia Campaign	NA	NA	Efficiency being assessed.
	Trash MEWEEs	NA	NA	Efficiency being assessed.
Regulatory Approaches	Bag Law	82,431	272	DDOE currently estimates (based on data collected for the development of the Anacostia Watershed Trash Reduction Plan) that there are 82,431 bags in the river and tributaries. This amount is first multiplied by 50.8%, since this is the proportion of the Anacostia River served by the MS4. The amount is then reduced by 50% because according to a recent survey report, 50% of businesses in the District report a 50% reduction in bag purchases. Finally, the total number of bags is then multiplied by 0.013 lbs, which is the standard weight for a plastic bag.
Total currently removed per year (pounds)		981,928	85,218	

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Next Steps

DDOE is looking for public feedback on this proposed strategy and calculation methodology. Given the current status of efforts in the District, DDOE is confident the District will meet its goal of reducing 103,188 pounds of trash from reaching the Anacostia per year by 2017.

Please submit comments and questions to Matt Robinson of the DDOE Stormwater Management Division at matthew.robinson@dc.gov. Matt can also be reached at the following telephone numbers: (202) 442-3204.