

Determining Load Reduction Values for BMAPs

Florida Stormwater Association
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Presentation Overview

- Background and Process
- Tools to Estimate Reductions
- Street Sweeping Calculations
- CDS Units and Stormceptor Calculations
- Credit for Education Efforts
- Agricultural BMP Reductions
- Septic Tank Phase-Out Reductions
- Future Refinements of Tools and Estimates

Background

- TMDLs
- Allocations
- Meeting BMAP Requirements
- Consistency

Structural BMP Load Reductions- EPA Spreadsheet Tool

- Excel spreadsheet tool
- Simple to use
- Can be modified to basin-specific characteristics

Application of the EPA Tool

- This tool applies to structural projects such as:
 - Wet pond
 - Dry detention
 - Retention
 - Filter strips
 - Grass swales
- The tool uses estimated removal efficiencies for BMPs designed to water management district presumptive criteria for new development



Photo:
Brevard
County
Stormwater

Calculations with the EPA Tool

- The tool requires:
 - Type of BMP;
 - Acres of each type of land use in sewered areas; and
 - Acres of each type of land use in unsewered areas.
- The tool then provides:
 - The load before the BMP (lbs/yr);
 - The load after the BMP is implemented; and
 - The total load reduction from the BMP.
- This information is available for: BOD, TSS, lead, copper, zinc, TN, and TP.

AVERAGE POLLUTANT LOADS BY LAND USE (Lbs/Ac./Yr.) 1

Land Use	Commercial	Industrial	Institutional	Transportation	Multi-Residential	Agriculture	Vacant	Open Space
BOD (Sewered)	127	87	52	48	89	32	2	1
BOD (Unsewered)	112	77	31	43	75	28	11	0.4
COD (Sewered)	589	260	320	881	320	140	64	46
COD (Unsewered)	520	230	190	518	260	71	28	15
TSS (Sewered)	858	844	1320	401	564	124	100	61
TSS (Unsewered)	757	746	790	355	499	109	144	20
LEAD (Sewered)	1.80	1.92	0.40	1.60	0.70	0.18	0.03	0.02
LEAD (Unsewered)	1.60	1.70	0.22	1.42	0.60	0.16	0.00	0.01
COPPER (Sewered)	0.2	0.21	0.1	0.56	0.1	0.1	0.01	0.01
COPPER (Unsewered)	0.18	0.18	0.061	0.33	0.1	0	0.0044	0.002
ZINC (Sewered)	1.43	1.2	0.6	1.12	0.41	0.9	0.1	0.08
ZINC (Unsewered)	1.3	1.1	0.34	1	0.4	0.5	0.069	0.03
TDS (Sewered)	2830	1290	623	6060	623	436	1210	724
TDS (Unsewered)	2500	1130	374	3565	498	218	89.2	241
TN (Sewered)	20	16	11	15	19	10	1	1
TN (Unsewered)	18	14	6.5	13	17	9	7	0.2
TKN (Sewered)	6.9	4	6.4	18	6.4	3.2	2.2	1.3
TKN (unsewered)	6.1	4	3.8	11	5.1	1.6	0.91	0.44
DP (Sewered)	0.69	0.86	0.61	0.2	0.61	0.3	0.1	0.08
DP (Unsewered)	0.61	0.75	0.36	0.1	0.48	0.1	0.08	0.03
TP (Sewered)	2.9	2.7	1.4	2.9	3.8	1.3	0.22	0.39
TP (Unsewered)	2.54	2.4	0.8	2.6	3.4	1.2	0.18	0.13
CADMIUM (sewered)	0.008	0.03	0.0037	0.021	0	0	0.0003	0.0002
CADMIUM (Unsewered)	0.0071	0.02	0.0022	0.012	0	0	0.0002	0.0001

1. Unit Area Pollutant Load Estimates are from US EPA, Harper et.al., Eric Livingston et.al., etc.

URBAN RUNOFF BMP POLLUTANT LOAD REDUCTION WORKSHEET

Please fill in the gray areas below. Once you have estimated the load reductions, print a copy of this worksheet.

Project Manager:
Project Name:
:

Example

	NR
	SR 200

Notes:

The methodology was developed by Environmental Protection Agency, and efficiency values used in this worksheet were from Harper et al., Eric Livingston et al., EPA, and TMDL documents.

Please Select a Best Management Practice:

- | | | |
|--|---|--|
| ☐ Vegetated Filter Strips | ☐ Sand Filters | ☐ Retention (1.00") |
| ☐ Grass Swales | ☐ WO Inlets | ☐ WO Inlet w/ Sand Filter |
| ☐ Retention (0.25") | ☐ Weekly Street Sweeping | ☐ Oil/Grit Separator |
| ☐ Wet Pond (1",14day) | ☐ Retention (0.75") | ☐ Wet Pond(0.5",7 day) |
| ☐ Wetland Detention | ☐ Infiltration Trench | |
| ☐ Dry Detention | ☐ Porous Pavement | |
| ☐ Retention (0.50") | ☐ Concrete Grid Pavement | |

Please enter landuse of contributing/drainage area in acres:

	Sewered	Unsewered
Commercial	0	0
Industrial	0	0
Institutional	0	0
Transportation	0	0
Multi-Family	0	0
Residential	0	0
Agriculture	0	0
Vacant	0	0
Open Space	0	0

Note: Sewered refers closed loop storm sewers systems e.g pipes and Unsewered refers to open loop storm sewers system e.g ditches, etc

Estimated Load and Load Reductions

	Load before BMP (lbs/yr)	Load after BMP (lbs/yr)	Load Reduction (lbs/yr)
BOD	0	0	0
TSS	0	0	0
LEAD	0	0	0
COPPER	0	0	0
ZINC	0	0	0
TN	0	0	0
TP	0	0	0

U = Removal Efficiency for the particular BMP and constituent unavailable.

FSA Spreadsheet Tool

- Spreadsheet tool focused on nonstructural BMPs and maintenance of structural BMPs.
- Due to lack of Florida-specific data results were rejected by FDEP for use in BMAPs.
- Sansalone study gathering Florida data.

Street Sweeping



Photo: Wikipedia

Street Sweeping Load Reductions

- Studies are currently ongoing to obtain better information on load reductions for street sweeping.
- FDEP approved provisional estimates until information from the Florida-specific studies are available.
- These reduction estimates were used in the Lower St. Johns River and Lake Jesup basins.

Provisional Estimates

- The provisional street sweeping load reductions are based on a 2001 report by FDOT District 7 and the University of South Florida.

Frequency of Street Sweeping	Reduction for TP	Reduction for TN
2 times/week	20%	10%
1 time/week	15%	7.5%
1 time/two weeks	10%	5%

Street Sweeping Calculations

- The total load reduction is calculated using the percent reduction times the load from the road catchment basin.
- The catchment basin includes the entire area that the road drains.
- The load from catchment basin is calculated using the EMC for the land use and the soil curve number for the basin.
- If specific land use and soil information is not available, the percent reduction should be discounted by fifty percent.

CDS Units and Stormceptor



Photo: Brevard County Stormwater

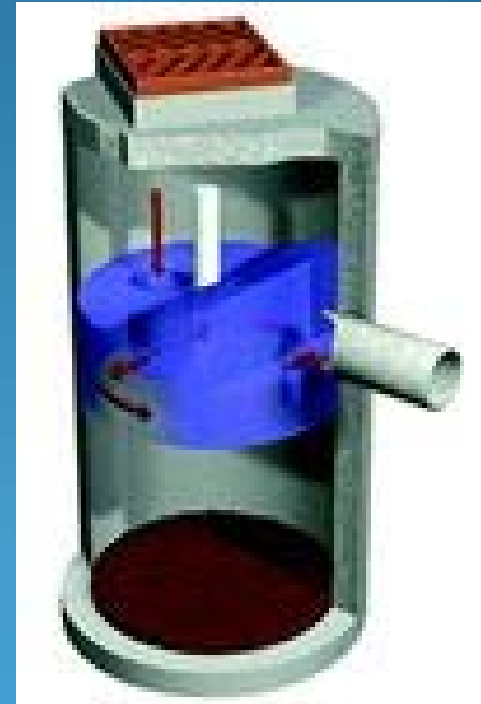


Photo: Rinker Materials

CDS Units and Stormceptor

- CDS units and Stormceptor provisional reductions were also provided by FDEP for the Lower St. Johns River and Lake Jesup basins.
- These units only provide nutrient reductions for total phosphorus as follows:
 - CDS units – 5%
 - Stormceptor – 5%
- Once Florida-specific information is available, the estimated reductions for these units will be revised.

Load Reduction Calculations

- The reductions from CDS units and Stormceptor are calculated using a similar method to the street sweeping calculations.
- The load from the area that the BMP serves is estimated based on EMCs and soil curve numbers for that area.
- The percent reduction is then applied to this load.

Education Activities



Photo: Florida Yards & Neighborhoods Program

Credit for Education Efforts

- Up to a 5% reduction of the starting load for total nitrogen and total phosphorus can be achieved through education efforts.
- There are six main categories of nutrient-specific education activities and all must be implemented by an entity in order to receive full credit.

Categories of Education Efforts

1. Local funding to implement the Florida Yards and Neighborhoods program within the city or county.
2. Local land development codes or ordinances for landscaping, irrigation, fertilizer, and pet waste management.
3. Implementation of public service announcements (PSAs) on local cable or commercial television and radio stations.
4. Informational pamphlets on pollution prevention, fertilizer application, Florida Friendly Landscaping, water conservation, septic tank maintenance, etc. Presentations on the above topics to civic groups, local businesses, students, and the general public.
5. Websites to provide information on reducing nutrient pollution for homeowners and businesses.
6. Inspection program and public call-in number to address illicit discharges.

Credit for Activities Implemented

- All six criteria = 5%
- Only PSAs, websites, brochures, etc. = 1%
- FYN only (no ordinances) = 3%
- All four ordinances only (no FYN) = 3%
- Other combinations are analyzed by FDEP on a case-by-case basis.

Agricultural BMPs



Photos: Florida Department of Agriculture and Consumer Services

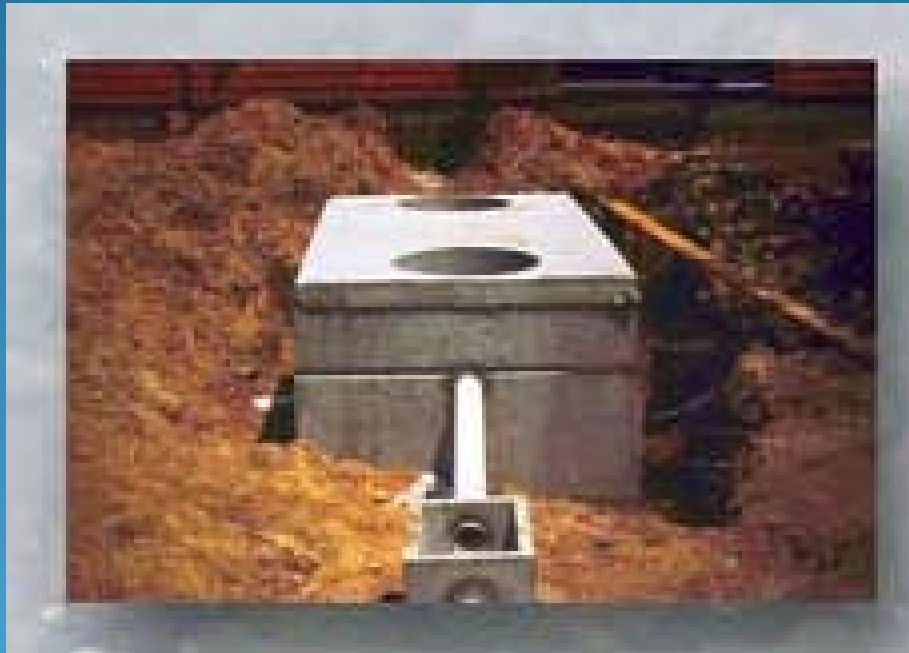
Agricultural BMP Reductions

- Agriculture is given responsibility for its loading in the BMAPs.
- Local growers are required to implement BMPs for their crop types if the BMP manual has been adopted by the Florida Department of Agriculture and Consumer Services (FDACS).
- If a grower chooses not to implement BMPs, they must monitor the runoff from their site and show that it is not having an impact on water quality.

Agricultural BMPs (con't)

- The expected BMP reductions vary based on commodity type and the soils in the basin.
- FDACS and FDEP work together to estimate the expected load reduction from BMP implementation as part of the BMAP process.

Septic Tank Phase-Outs



Photos: U.S. Environmental Protection Agency

Septic Tank Phase-Out Reductions

- Little information is available related to the expected load contributions from septic tanks and the distance from surface waters in which loading can occur.
- FDEP is sponsoring a study in the City of Jacksonville to answer these questions.
- The study will encompass four different areas with multiple sites in each area to obtain information for various soil and groundwater conditions.
- Information from this study will help refine septic tank loading estimates in the TMDLs and provide a better understanding of the benefits from phase-outs.

Future Refinements

- Some of the current BMP estimates that are utilized in the tools and calculations are not based on Florida-specific information.
- Several studies are ongoing to help refine this information for future BMAPs and BMAP updates.
- These studies are being conducted by:
 - FSA
 - FDEP
 - Local stakeholders

Questions?

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