

Table 5.3 The Effectiveness of Storm Water Treatment Practices in Removing Pollutants (Loading Reduction by % Removal Rate).

PRACTICE	TSS	Total P	Total N	Cu	Zn	Pb	BOD ₅	O / G ¹	Organics	Bact	Criteria for Evaluation
a. Bioretention/Rain Gardens ²	90	70-83	68-80	93-98	93-98	93-98	ND	ND	90	90	Area of BMP installed, total # of sites implementing BMP; drainage area and calculated pollutant loading reduction
b. Buffer/Vegetated Filter Strips ³	50-90	50-80	ND	ND	ND	ND	ND	ND	ND	ND	Length of BMP installed, total # of sites implementing BMP; estimated pollutant reduction
c. Catch Basin Cleaning ³	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	# of catch basins cleaned
d. Construction Phasing ³	42 ⁴	ND	ND	ND	ND	ND	ND	ND	ND	ND	Total # of sites implementing BMP
e. Detention Basin (Dry) ⁵	50	20	25	26	26	ND	ND	3	ND	44	Area of BMP installed, total # of sites implementing BMP; drainage area and calculated pollutant loading reduction
f. Detention Basin (Extended Dry) ⁶	80-90	20-30	10-20	50-60	30-50	70-80	20-30	ND	ND	ND	Area of BMP installed, total # of sites implementing BMP; drainage area and calculated pollutant loading reduction
g. Detention Basin (Wet)A, ⁶	80-90	35-70	15-50	60-70	40-50	ND	20-40	78	ND	70	Area of BMP installed, total # of sites implementing BMP; drainage area and calculated pollutant loading reduction
h. Detention Basin (Constructed Wetland) ^{3,5,7}	75-85	30-65	10-30	40	44	ND	ND	85	ND	78	Area of BMP installed, total # of sites implementing BMP; drainage area and calculated pollutant loading reduction
i. Filtering Practices ^{2,5}	86	59	38	49	88	ND	ND	84	ND	37	Area/length of BMP installed, total # of sites implementing BMP
j. Filtering Practices (Vertical Sand Filters) ^{2,5,8}	60-95	45	40-65	ND	ND	ND	ND	15	ND	ND	Area/length of BMP installed, total # of sites implementing BMP
k. Grassed Swales (Ditches/Biofilters/Highway Swales) ^{3,6,9}	65-90	15-50	30-50	40-60	40-50	ND	20-40	60	ND	ND	Area/length of BMP installed, total # of sites implementing BMP; drainage area and calculated pollutant loading reduction

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l. Infiltration ⁵	95	80	51	ND	ND	ND	ND	ND	ND	ND	Area/length of BMP installed, total # of sites implementing BMP; drainage area and calculated pollutant loading reduction & %runoff using infiltration
m. Infiltration Basin ³	50-80	100	ND	ND	ND	ND	ND	ND	ND	ND	Area of BMP installed, total # of sites implementing BMP; drainage area and calculated pollutant loading reduction & %runoff using infiltration
n. Infiltration Trenches/Dry Wells ^{3,10, 11}	50-90	60-70	60	90	90	90	70-80	ND	ND	90	Length of BMP installed, total # of sites implementing BMP
o. Porous Pavement ^{8,12}	82-95	65	80-85	ND	ND	ND	ND	ND	ND	ND	Area of BMP installed, total # of sites implementing BMP; estimated volume reduction
p. Riparian Buffers ¹³	grass: 63-89	forested: 23-42; grass: 39-78	forested: 85; grass: 17-99	ND	ND	ND	ND	ND	ND	ND	Length of BMP installed, total # of sites implementing BMP.
q. Sand Filters ^{3,6}	70-90	20-60	40-70	30-60	50-80	ND	30-50	ND	ND	ND	Length of BMP installed, total # of sites implementing BMP
r. Silt Fences (a=If properly installed and maintained¹⁴; b=If installed at toe of slope¹⁵)³	a=75- 86; b=36- 65	ND	ND	ND	ND	ND	ND	ND	ND	ND	Length of BMP installed, total # of sites implementing BMP.
s. Stabilizing Soils on Construction Sites ^{3, 16}	80-90	ND	ND	ND	ND	ND	ND	ND	ND	ND	# of new construction sites in municipality, area of BMP installed.
t. Street Sweeping ^{3,17}	50-90	50-90	ND	ND	ND	ND	ND	ND	ND	ND	Miles of streets swept, volume of sediment collected.
u. Swirl Concentrator Unit	60-80	60-80	ND	ND	ND	ND	ND	ND	ND	ND	Total # of sites implementing BMP, # of BMP installed; drainage area and calculated pollutant loading reduction

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v. Low-Impact Development	10-30	10-30	ND	ND	ND	ND	ND	ND	ND	ND	# of Low-Impact-Developments built.

ND = No Data

Total P = Total Phosphorus

Total N = Total NO₂₋₃

Cu=Copper; Zn=Zinc; Pb=Lead

Zn = Zinc

O / G = Oil/Grease

¹ Represents Data for Oil/Grease and PAHs

² EPA Storm Water Technology Fact Sheet - Bioretention, September 1999.

³ From Section 6.2 Description and Performance of Stormwater Best Management Practices Considered. Lower One Rouge River Subwatershed Management Plan, April 2001.

⁴ Claytor. Watershed Protection Techniques, Technical Note 80.

⁵ From Section 5.3.1 Definition and Performance of Best Management Practices, Stony Creek Subwatershed Plan, November, 2003.

⁶ From Rouge River National Wet Weather Demonstration Project Pilot Best Management Practices Projects (319 Grant), February 27, 1996.

⁷ Urbanization and Water Quality: A Guide to Protecting the Urban Environment. 1994. The Terrene Institute, Washington, D.C.

⁸ Erosion and Sediment Control Best Management Practices (BMPs) Research Project; Second Edition December 2002, PBSJ Water Resources Program, MD.

⁹ Reeves, E. 1994. Performance and Condition of Biofilters in the Pacific Northwest, Technical Note 30, Watershed Protection Techniques, Vol. 1, No. 3, P. 117-119.

¹⁰ EPA Storm Water Technology Fact Sheet - Infiltration Trench, September 1999.

¹¹ Horner, Richard. 1994. Fundamentals of Urban Runoff Management, Terrene Institute, Washington, D.C., P. 116.

¹² EPA Storm Water Technology Fact Sheet - Porous Pavement, September 1999.

¹³ Mill Creek Subwatershed Management Plan

¹⁴ Goldman, S.J., K. Jackson and T.A. Bursztynsky. 1986. Erosion and Sediment Control Handbook. McGraw-Hill Book Company. New York, NY.

¹⁵ Harding, M.V. 1990. Erosion Control Effectiveness: Comparative Studies of Alternative Mulching Techniques, Environmental Restoration; Science and Strategies for Restoring the Earth, Island Press, Covello, CA, P. 149-156.

¹⁶ Brown, W. and D. Caraco. 1996. Task 2 Technical Memorandum: Innovative and Effective Erosion and Sediment Control Practices for Small Sites. Center for Watershed Protection for the US EPA Office of Wastewater Management. Silver Spring, MD.

¹⁷ Watershed Protection Techniques. 1999. Technical Note: 103. Vol. 3, No. 1, P. 601.