

DEQ Virginia Runoff Reduction Method Re-Development Compliance Spreadsheet - Version 3.0

2013 BMP Standards and Specifications		2013 Draft BMP Standards and Specifications		
Project Name:	12917 Percheron Lane - Existing Condition	CLEAR ALL	data input cells	
Date:	Jan 29th 2024		constant values	
Linear Development Project?	No		calculation cells	
Site Information			final results	
Post-Development Project (Treatment Volume and Loads)				
Enter Total Disturbed Area (acres) →	0.83	Check:	BMP Design Specification List: 2011 Storm & Seeps	
Maximum reduction required: The site's net increase in impervious cover (acres) is:	0.01325473	Linear project?	No	
Post-Development TP Load Reduction for Site (lb/yr):	0.69	Land cover areas entered correctly?	✓	
		Total disturbed area entered?	✓	
Pre-Development Land Cover (acres)				
	A Soils	B Soils	C Soils	
Forest/Open Space (acres) - undisturbed, wooded (disturbed areas are calculated)	0.21	0.21		
Managed Turf (acres) - disturbed, graded for aesthetic cover and to meet aesthetic	0.44	0.44		
Impervious Cover (acres)	0.18	0.18		
	0.83			
Post-Development Land Cover (acres)				
	A Soils	B Soils	C Soils	
Forest/Open Space (acres) - undisturbed, wooded (disturbed areas are calculated)	0.24	0.24		
Managed Turf (acres) - disturbed, graded for aesthetic cover and to meet aesthetic	0.39	0.39		
Impervious Cover (acres)	0.20	0.20		
	0.83			
Area Check	OK	OK	OK	
*Forest/Open Space areas must be entered in accordance with the Weighted Runoff Reduction Method				
Constants				
	Runoff Coefficients (Rv)			
Forest/Open Space	0.05	A Soils	0.05	
Forest/Open Space - Cont. (disturb.)	0.02	B Soils	0.04	
Managed Turf	0.15	C Soils	0.05	
Impervious Cover	0.75		0.75	
Target TP Load (lb/acre/yr)	0.41			
% Impervious (pre-dev)	0.22			
LAND COVER SUMMARY - PRE-REDEVELOPMENT				
Land Cover Summary-Pre	Land Cover Summary-Post/Final	Land Cover Summary-Post	Land Cover Summary-Post	
Pre-Development	Post-Dev. & New Impervious	Post-Redevelopment	Post-Development New Impervious	
Forest/Open Space (acres)	0.21	Forest/Open Space - Cont. (disturb.)	0.24	
Weighted Reduction	0.05	Managed Turf	0.39	
% Forest	25%	% Forest	29%	
Managed Turf (acres)	0.44	Managed Turf Cover (acres)	0.39	
Weighted Reduction	0.15	Weighted Runoff	0.25	
% Managed Turf	53%	% Managed Turf	48%	
Impervious Cover (acres)	0.18	Impervious Cover (acres)	0.18	
Reduction	0.05	New Impervious Cover (acres)	0.02	
% Impervious	22%	% Impervious	22%	
Total Site Area (acres)	0.83	Total Redev. Site Area (acres)	0.81	
Site Rv	0.35	Redev Site Rv	0.35	
Treatment Volume and Nutrient Load				
Pre-Development Treatment Volume (acre-ft)	0.0244	0.0241	Final Post-Development Treatment Volume (acre-ft)	0.0251
Pre-Development Treatment Volume (cubic feet)	1,065	1,048	Final Post-Development Treatment Volume (cubic feet)	1,091
Pre-Development TP Load (lb/yr)	0.67	0.66	Final Post-Development TP Load (lb/yr)	0.69
Pre-Development TP Load per acre (lb/acre/yr)	0.81	0.81	Final Post-Development TP Load per acre (lb/acre/yr)	0.83
Baseline TP Load (lb/yr)	0.26	0.33	Final Post-Development TP Load per acre (lb/acre/yr)	0.83
TP Load Reduction Required for Redeveloped Area (lb/yr)	0.05		TP Load Reduction Required for Redeveloped Area (lb/yr)	0.05
TP Load Reduction Required for New Impervious Area (lb/yr)			TP Load Reduction Required for New Impervious Area (lb/yr)	0.03
Post-Development Requirement for Site Area				
TP Load Reduction Required (lb/yr)	0.09			
Nitrogen Loads (Informational Purposes Only)				
Pre-Development TN Load (lb/yr)	4.79	Final Post-Development TN Load (Post-Redevelopment & New Impervious) (lb/yr)	4.91	

Drainage Area A

CLEAR BMP AREAS

Drainage Area A Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals	Land Cover Rv
Forest/Open Space (acres)					0.00	0.00
Managed Turf (acres)					0.00	0.00
Impervious Cover (acres)				0.08	0.08	0.95
Total					0.08	

Total Phosphorus Available for Removal in D.A. A (lb/yr)	0.17
Post Development Treatment Volume in D.A. A (ft ³)	276

Stormwater Best Management Practices (RR = Runoff Reduction)

Practice	Runoff Reduction Credit (%)	Managed Turf Credit Area (acres)	Impervious Cover Credit Area (acres)	Volume from Upstream Practice (ft ³)	Runoff Reduction (ft ³)	Remaining Runoff Volume (ft ³)	Total BMP Treatment Volume (ft ³)	Phosphorus Removal Efficiency (%)	Phosphorus Load from Upstream Practices (lb)	Untreated Phosphorus Load to Practice (lb)	Phosphorus Removed By Practice (lb)	Remaining Phosphorus Load (lb)	--Select from dropdown lists--
													Downstream Practice to be Employed
1. Vegetated Roof (RR)													
1.a. Vegetated Roof #1 (Spec #5)	45				0	0	0	0		0.00	0.00	0.00	
1.b. Vegetated Roof #2 (Spec #5)	60				0	0	0	0		0.00	0.00	0.00	
2. Rooftop Disconnection (RR)													
2.a. Simple Disconnection to A/B Soils (Spec #1)	50			0	0	0	0	0	0.00	0.00	0.00	0.00	
2.b. Simple Disconnection to C/D Soils (Spec #1)	25			0	0	0	0	0	0.00	0.00	0.00	0.00	
2.c. To Soil Amended Filter Path as per specifications (existing C/D soils) (Spec #4)	50		0.08	0	138	138	276	0	0.00	0.17	0.09	0.09	
2.d. To Dry Well or French Drain #1, Micro-infiltration #1 (Spec #8)	50			0	0	0	0	25	0.00	0.00	0.00	0.00	
2.e. To Dry Well or French Drain #2, Micro-infiltration #2 (Spec #8)	90			0	0	0	0	25	0.00	0.00	0.00	0.00	
2.f. To Rain Garden #1, Micro-Bioretenion #1 (Spec #9)	40			0	0	0	0	25	0.00	0.00	0.00	0.00	
2.g. To Rain Garden #2, Micro-Bioretenion #2 (Spec #9)	80			0	0	0	0	50	0.00	0.00	0.00	0.00	
2.h. To Rainwater Harvesting (Spec #6)	0			0	0	0	0	0	0.00	0.00	0.00	0.00	
2.i. To Stormwater Planter, Urban Bioretenion (Spec #9, Appendix A)	40			0	0	0	0	25	0.00	0.00	0.00	0.00	
3. Permeable Pavement (RR)													
3.a. Permeable Pavement #1 (Spec #7)	45			0	0	0	0	25	0.00	0.00	0.00	0.00	
3.b. Permeable Pavement #2 (Spec #7)	75				0	0	0	25		0.00	0.00	0.00	
4. Grass Channel (RR)													
4.a. Grass Channel A/B Soils (Spec #3)	20			0	0	0	0	15	0.00	0.00	0.00	0.00	
4.b. Grass Channel C/D Soils (Spec #3)	10			0	0	0	0	15	0.00	0.00	0.00	0.00	
4.c. Grass Channel with Compost Amended Soils as per specs (see Spec #4)	30			0	0	0	0	15	0.00	0.00	0.00	0.00	
5. Dry Swale (RR)													
5.a. Dry Swale #1 (Spec #10)	40			0	0	0	0	20	0.00	0.00	0.00	0.00	
5.b. Dry Swale #2 (Spec #10)	60			0	0	0	0	40	0.00	0.00	0.00	0.00	
6. Bioretenion (RR)													
6.a. Bioretenion #1 or Micro-Bioretenion #1 or Urban Bioretenion (Spec #9)	40			0	0	0	0	25	0.00	0.00	0.00	0.00	
6.b. Bioretenion #2 or Micro-Bioretenion #2 (Spec #9)	80			0	0	0	0	50	0.00	0.00	0.00	0.00	
7. Infiltration (RR)													
7.a. Infiltration #1 (Spec #8)	50			0	0	0	0	25	0.00	0.00	0.00	0.00	
7.b. Infiltration #2 (Spec #8)	90			0	0	0	0	25	0.00	0.00	0.00	0.00	
8. Extended Detention Pond (RR)													
8.a. ED #1 (Spec #15)	0			0	0	0	0	15	0.00	0.00	0.00	0.00	

Nitrogen Removal Efficiency (%)	Nitrogen Load from Upstream Practices (lbs)	Untreated Nitrogen Load to Practice (lbs)	Nitrogen Removed By Practice (lbs)	Remaining Nitrogen Load (lbs)
1. Vegetated Roof (RR)				
0		0.00	0.00	0.00
0		0.00	0.00	0.00
2. Rooftop Disconnection (RR)				
0	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00
0	0.00	1.24	0.62	0.62
15	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00
60	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00
3. Permeable Pavement (RR)				
25	0.00	0.00	0.00	0.00
25		0.00	0.00	0.00
4. Grass Channel (RR)				
20	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00
5. Dry Swale (RR)				
25	0.00	0.00	0.00	0.00
35	0.00	0.00	0.00	0.00
6. Bioretenion (RR)				
40	0.00	0.00	0.00	0.00
60	0.00	0.00	0.00	0.00
7. Infiltration (RR)				
15	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00
8. Extended Detention Pond (RR)				
10	0.00	0.00	0.00	0.00

8.b. ED #2 (Spec #15)	15			0	0	0	0	15	0.00	0.00	0.00	0.00	
9. Sheetflow to Filter/Open Space (RR)													
9.a. Sheetflow to Conservation Area, A/B Soils (Spec #2)	75			0	0	0	0	0	0.00	0.00	0.00	0.00	
9.b. Sheetflow to Conservation Area, C/D Soils (Spec #2)	50			0	0	0	0	0	0.00	0.00	0.00	0.00	
9.c. Sheetflow to Vegetated Filter Strip, A Soils or Compost Amended B/C/D Soils (Spec #2 & #4)	50			0	0	0	0	0	0.00	0.00	0.00	0.00	

10	0.00	0.00	0.00	0.00
9. Sheetflow to Filter/Open Space (RR)				
0	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00

TOTAL IMPERVIOUS COVER TREATED (ac)	0.08	AREA CHECK: OK.
TOTAL MANAGED TURF AREA TREATED (ac)	0.00	AREA CHECK: OK.
TOTAL RUNOFF REDUCTION IN D.A. A (ft ³)	138	
TOTAL PHOSPHORUS AVAILABLE FOR REMOVAL IN D.A. A (lb/yr)	0.17	
TOTAL PHOSPHORUS REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.09	
TOTAL PHOSPHORUS REMAINING AFTER APPLYING RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.09	
SEE WATER QUALITY COMPLIANCE TAB FOR SITE COMPLIANCE CALCULATIONS		

TOTAL RUNOFF REDUCTION IN D.A. A (ft ³)	138
NITROGEN REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.62
SEE WATER QUALITY COMPLIANCE TAB FOR SITE CALCULATIONS (Information Only)	

10. Wet Swale (no RR)													
10.a. Wet Swale #1 (Spec #11)	0			0	0	0	0	20	0.00	0.00	0.00	0.00	
10.b. Wet Swale #2 (Spec #11)	0			0	0	0	0	40	0.00	0.00	0.00	0.00	

10. Wet Swale (Coastal Plain) (no RR)				
25	0.00	0.00	0.00	0.00
35	0.00	0.00	0.00	0.00

11. Filtering Practices (no RR)													
11.a. Filtering Practice #1 (Spec #12)	0			0	0	0	0	60	0.00	0.00	0.00	0.00	
11.b. Filtering Practice #2 (Spec #12)	0			0	0	0	0	65	0.00	0.00	0.00	0.00	

11. Filtering Practices (no RR)				
30	0.00	0.00	0.00	0.00
45	0.00	0.00	0.00	0.00

12. Constructed Wetland (no RR)													
12.a. Constructed Wetland #1 (Spec #13)	0			0	0	0	0	50	0.00	0.00	0.00	0.00	
12.b. Constructed Wetland #2 (Spec #13)	0			0	0	0	0	75	0.00	0.00	0.00	0.00	

12. Constructed Wetland (no RR)				
25	0.00	0.00	0.00	0.00
55	0.00	0.00	0.00	0.00

13. Wet Ponds (no RR)													
13.a. Wet Pond #1 (Spec #14)	0			0	0	0	0	50	0.00	0.00	0.00	0.00	
13.b. Wet Pond #1 (Coastal Plain) (Spec #14)	0			0	0	0	0	45	0.00	0.00	0.00	0.00	
13.c. Wet Pond #2 (Spec #14)	0			0	0	0	0	75	0.00	0.00	0.00	0.00	
13.d. Wet Pond #2 (Coastal Plain) (Spec #14)	0			0	0	0	0	65	0.00	0.00	0.00	0.00	

13. Wet Ponds (no RR)				
30	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00

14. Manufactured Treatment Devices (no RR)													
14.a. Manufactured Treatment Device-Hydrodynamic	0			0	0	0	0	20	0.00	0.00	0.00	0.00	
14.b. Manufactured Treatment Device-Filtering	0			0	0	0	0	20	0.00	0.00	0.00	0.00	
14.c. Manufactured Treatment Device-Generic	0			0	0	0	0	20	0.00	0.00	0.00	0.00	

14. Manufactured BMP (no RR)				
0	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00

TOTAL IMPERVIOUS COVER TREATED (ac)	0.08	AREA CHECK: OK.
TOTAL MANAGED TURF AREA TREATED (ac)	0.00	AREA CHECK: OK.
TOTAL PHOSPHORUS REMOVAL REQUIRED ON SITE (lb/yr)	0.09	
TOTAL PHOSPHORUS AVAILABLE FOR REMOVAL IN D.A. A (lb/yr)	0.17	
TOTAL PHOSPHORUS REMOVED WITHOUT RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.00	
TOTAL PHOSPHORUS REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.09	
TOTAL PHOSPHORUS LOAD REDUCTION ACHIEVED IN D.A. A (lb/yr)	0.09	
TOTAL PHOSPHORUS REMAINING AFTER APPLYING BMP LOAD REDUCTIONS IN D.A. A (lb/yr)	0.09	

SEE WATER QUALITY COMPLIANCE TAB FOR SITE COMPLIANCE CALCULATIONS

NITROGEN REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.62
NITROGEN REMOVED WITHOUT RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.00
TOTAL NITROGEN REMOVED IN D.A. A (lb/yr)	0.62

Site Results (Water Quality Compliance)

Area Checks	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	AREA CHECK
FOREST/OPEN SPACE (ac)	0.00	0.00	0.00	0.00	0.00	OK
IMPERVIOUS COVER (ac)	0.08	0.00	0.00	0.00	0.00	OK
IMPERVIOUS COVER TREATED (ac)	0.08	0.00	0.00	0.00	0.00	OK
MANAGED TURF AREA (ac)	0.00	0.00	0.00	0.00	0.00	OK
MANAGED TURF AREA TREATED (ac)	0.00	0.00	0.00	0.00	0.00	OK
AREA CHECK	OK	OK	OK	OK	OK	
Site Treatment Volume (ft³)	1,091					
Runoff Reduction Volume and TP By Drainage Area						
	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	TOTAL
RUNOFF REDUCTION VOLUME ACHIEVED (ft ³)	138	0	0	0	0	138
TP LOAD AVAILABLE FOR REMOVAL (lb/yr)	0.17	0.00	0.00	0.00	0.00	0.17
TP LOAD REDUCTION ACHIEVED (lb/yr)	0.09	0.00	0.00	0.00	0.00	0.09
TP LOAD REMAINING (lb/yr)	0.09	0.00	0.00	0.00	0.00	0.09
NITROGEN LOAD REDUCTION ACHIEVED (lb/yr)	0.62	0.00	0.00	0.00	0.00	0.62
Total Phosphorus						
FINAL POST-DEVELOPMENT TP LOAD (lb/yr)	0.69					
TP LOAD REDUCTION REQUIRED (lb/yr)	0.69					
TP LOAD REDUCTION ACHIEVED (lb/yr)	0.09					
TP LOAD REMAINING (lb/yr)	0.60					
REMAINING TP LOAD REDUCTION REQUIRED (lb/yr)	0.00	**				
	**No further TP load reduction required					
Total Nitrogen (For Information Purposes)						
POST-DEVELOPMENT LOAD (lb/yr)	4.91					
NITROGEN LOAD REDUCTION ACHIEVED (lb/yr)	0.62					
REMAINING POST-DEVELOPMENT NITROGEN LOAD (lb/yr)	4.29					