

LEGEND

— LIMITS OF DISTURBANCE (1.49 ACRES)

■ PERVIOUS AREA

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

Project Name: **Wawa - Sudley Road**
 Date: **9/7/2018**
 Linear Development Project?

Site Information

Enter Total Disturbed Area (acres): **1.46**
 Maximum reduction required: **20%**
 The site's soil is in pervious cover (acres): **0.22522957**
 Post-Development TP Load Reduction for Site (lb/yr): **0.67**

Pre-Development Land Cover (acres)

Land Cover	A Soils	B Soils	C Soils	D Soils	Total
Forest/Open Space	0.00	0.00	0.15	0.25	0.20
Managed Turf	0.00	0.00	0.00	0.00	0.00
Impervious Cover	0.00	0.00	0.58	0.56	1.17
Total	0.00	0.00	0.15	0.25	0.40

Post-Development Land Cover (acres)

Land Cover	A Soils	B Soils	C Soils	D Soils	Total
Forest/Open Space	0.00	0.00	0.15	0.25	0.20
Managed Turf	0.00	0.00	0.00	0.00	0.00
Impervious Cover	0.00	0.00	0.58	0.56	1.17
Total	0.00	0.00	0.15	0.25	0.40

Runoff Coefficients (Rv)

Soil Type	A Soils	B Soils	C Soils	D Soils
Forest/Open Space	0.02	0.05	0.05	0.05
Managed Turf	0.10	0.20	0.20	0.20
Impervious Cover	0.95	0.95	0.95	0.95

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Site Summary

Total Rainfall (in):	43
Total Disturbed Acreage:	1.46

Site Land Cover Summary

Pre-Development Land Cover (acres)

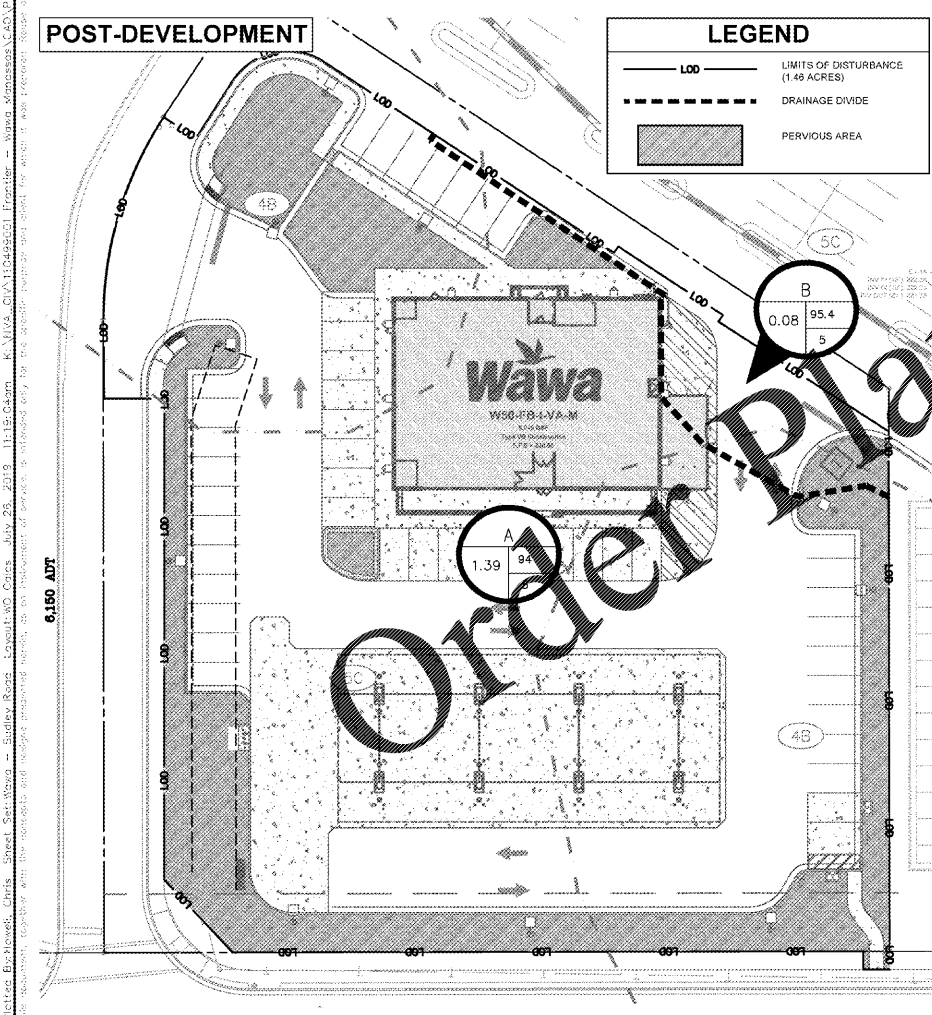
Land Cover	A Soils	B Soils	C Soils	D Soils	Totals	% of Total
Forest/Open	0.00	0.00	0.15	0.25	0.20	20
Managed Turf	0.00	0.00	0.00	0.00	0.00	0
Impervious Cover	0.00	0.00	0.58	0.56	1.17	80
Total	0.00	0.00	0.15	0.25	0.40	100

Post-Development Land Cover (acres)

Land Cover	A Soils	B Soils	C Soils	D Soils	Totals	% of Total
Forest/Open	0.00	0.00	0.00	0.00	0.00	0
Managed Turf	0.00	0.00	0.15	0.12	0.27	1.8
Impervious Cover	0.00	0.00	0.58	0.61	1.19	82
Total	0.00	0.00	0.15	0.61	0.76	100

Site TN and Land Cover Nutrient Loads

Site TN	Final Post-Development (Post-ReDevelopment & New Impervious)	Post-Development (New Impervious)	Post-Development (New Impervious)	Adjusted Pre-Development (New Impervious)	Final Post-Development TP Load per acre (lb/acre/yr)	Final Post-Development TP Load per acre (lb/acre/yr)	Post-Development TP Load per acre (lb/acre/yr)
Site TN	0.82	0.82	0.95	0.78	1.76	1.87	1.88
Treatment Volume (ft ³)	4,313	4,247	86	4,062			
TP Load (lb/yr)	2.72	2.67	0.05	0.67			



LEGEND

— LIMITS OF DISTURBANCE (1.49 ACRES)

- - - DRAINAGE DIVIDE

■ PERVIOUS AREA

LAND COVER SUMMARY - PRE-REDEVELOPMENT

Land Cover	Unadj.	Adj.
Forest/Open Space	0.20	0.20
Managed Turf	0.00	0.00
Impervious Cover	1.17	1.17
Total	1.47	1.47

LAND COVER SUMMARY - POST DEVELOPMENT

Land Cover	Unadj.	Adj.
Forest/Open Space	0.00	0.00
Managed Turf	0.27	0.27
Impervious Cover	1.19	1.19
Total	1.46	1.46

Treatment Volume and Nutrient Load

Item	Pre-Development	Post-Development
Treatment Volume (ft ³)	4,313	4,062
TP Load (lb/yr)	2.94	2.55

Site TN and Land Cover Nutrient Loads

Item	Final Post-Development (Post-ReDevelopment & New Impervious)	Post-Development (New Impervious)	Post-Development (New Impervious)	Adjusted Pre-Development (New Impervious)
Site TN	0.82	0.82	0.95	0.78
Treatment Volume (ft ³)	4,313	4,247	86	4,062
TP Load (lb/yr)	2.72	2.67	0.05	0.67

TP Load Reduction Required for Post-Development Area (lb/yr)

Final Post-Development (Post-ReDevelopment & New Impervious)	2.72
Pre-Development	18.28
TP Load Reduction Required (lb/yr)	0.67

Post-Development Requirement for Site Area

TP Load Reduction Required (lb/yr)	0.67
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Nitrogen Loads (Informational Purposes Only)

Item	Pre-Development TN Load (lb/yr)	Final Post-Development TN Load (Post-Development & New Impervious) (lb/yr)
Pre-Development TN Load	18.28	
Final Post-Development TN Load		18.48

Site Results (Water Quality Compliance)

Area Checks

Area Check	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)	1.18	0.00	0.00	0.00	0.00	OK
IMPERVIOUS COVER TREATED (ac)	0.00	0.00	0.00	0.00	0.00	OK
MANAGED TURF AREA (ac)	0.26	0.01	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	OK

Site Treatment Volume (ft³)

Site Treatment Volume	4,313
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Runoff Reduction Volume and TP by Drainage Area

Item	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	TOTAL
RUNOFF REDUCTION VOLUME ACHIEVED (ft ³)	0	0	0	0	0	0
TP LOAD AVAILABLE FOR REMOVAL (lb/yr)	2.58	0.15	0.00	0.00	0.00	2.72
TP LOAD REDUCTION ACHIEVED (lb/yr)	0.00	0.00	0.00	0.00	0.00	0.00
TP LOAD REMAINING (lb/yr)	2.58	0.15	0.00	0.00	0.00	2.72
NITROGEN LOAD REDUCTION ACHIEVED (lb/yr)	0.00	0.00	0.00	0.00	0.00	0.00

Total Phosphorus

Final Post-Development TP Load (lb/yr)	2.72
TP Load Reduction Required (lb/yr)	0.67
TP Load Reduction Achieved (lb/yr)	0.00
TP Load Remaining (lb/yr)	2.72
Remaining TP Load Reduction Required (lb/yr)	0.67

Total Nitrogen (For Informational Purposes)

Post-Development Load (lb/yr)	18.48
Nitrogen Load Reduction Achieved (lb/yr)	0.00
Remaining Post-Development Nitrogen Load (lb/yr)	18.48

Date: May 4, 2018
 To: Chris Howell, P.E., Kimley-Horn
 From: Elizabeth Yost, Credit Sales Coordinator, Resource Environmental Solutions
 Subject: Potomac Watershed - Nutrient Credit Availability

Project Reference: 10691 Davidson Place; 0.70 Credits Requested; HUC 02070010

This letter is to confirm the availability of 0.70 authorized nutrient credits ("Nutrient Credits") from one or more of Resource Environmental Solutions ("RES") Potomac nutrient bank facilities for use by permit applicants within the Potomac watershed, including HUC 02070010, to compensate for nutrient loadings in excess of state or local regulations, as per Virginia Code § 62.1-44.15:35 and § 62.1-44.19:14 and Virginia Administrative Code 9 VAC 25-820-10 et seq. These Nutrient Credits are generated and managed under the terms of the Banking Instruments known as the Hill Springs Farm Nutrient Reduction Implementation Plan ("NRIP") and/or the Edgecliff NRIP.

Please feel free to contact me if you have any questions.

Sincerely,
Elizabeth M. Yost
 Elizabeth M. Yost
 Resource Environmental Solutions
 eyost@res.us

Site Compliance Summary

Maximum % Reduction Required Below Pre-Development Load	20%
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Site Compliance Summary

Item	Value
Total Runoff Volume Reduction (ft ³)	0
Total TP Load Reduction Achieved (lb/yr)	0.00
Total TN Load Reduction Achieved (lb/yr)	0.00
Remaining Post Development TP Load (lb/yr)	2.72
Remaining TP Load Reduction Required (lb/yr)	0.67

WATER QUALITY NARRATIVE

THE LIMITS OF ANALYSIS FOR THE WATER QUALITY CALCULATIONS (1.46 ACRES) INCLUDE THE ENTIRE DISTURBED AREA FOR THE DEVELOPMENT. PER RE-DEVELOPMENT REQUIREMENTS FOR DISTURBED AREAS GREATER THAN 1 ACRE, THE ULTIMATE DEVELOPMENT REQUIRES A PHOSPHORUS LOAD REDUCTION OF 20% WHICH EQUATES TO 0.67 LBS / YEAR.

TO SATISFY REQUIREMENTS FOR WATER QUALITY ON SITE, WAWA PLANS TO PURCHASE 0.67 LBS OF NONPOINT PHOSPHORUS CREDITS FROM RESOURCE ENVIRONMENTAL SOLUTIONS (RES). ONCE THE CREDITS HAVE BEEN PURCHASED, THE AGREEMENT WILL BE PROVIDED TO THE COUNTY.

Kimley-Horn
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 11400 COMMERCE PARK DR., SUITE 400, RESTON, VA 20191
 PHONE: 703-674-1300 FAX: 703-674-1300
 WWW.KIMLEY-HORN.COM

COMMONWEALTH OF VIRGINIA
 ROSS STEVENS
 Lic. No. 047498
 02/06/2019
 PROFESSIONAL ENGINEER

STORMWATER QUALITY CALCULATIONS

WAWA - SUDLEY ROAD
 PREPARED FOR FRONTIER DEVELOPMENT
 PRINCE WILLIAM COUNTY, VA

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SHEET NUMBER C-430