



RESOURCE PROTECTION AREA (RPA)

ENCROACHMENT EXCEPTION #WAIV-2023-00380

WATER QUALITY IMPACT ASSESSMENT (WQIA) #WQIA-2023-
00020

7819 SOUTHDOWN RD, ALEXANDRIA, VA 22308

Mohan Bastakoti, P.E. Senior Engineer III
November 01, 2023



Aerial view of the site





Rear of existing house



Existing deck and steps to remain.

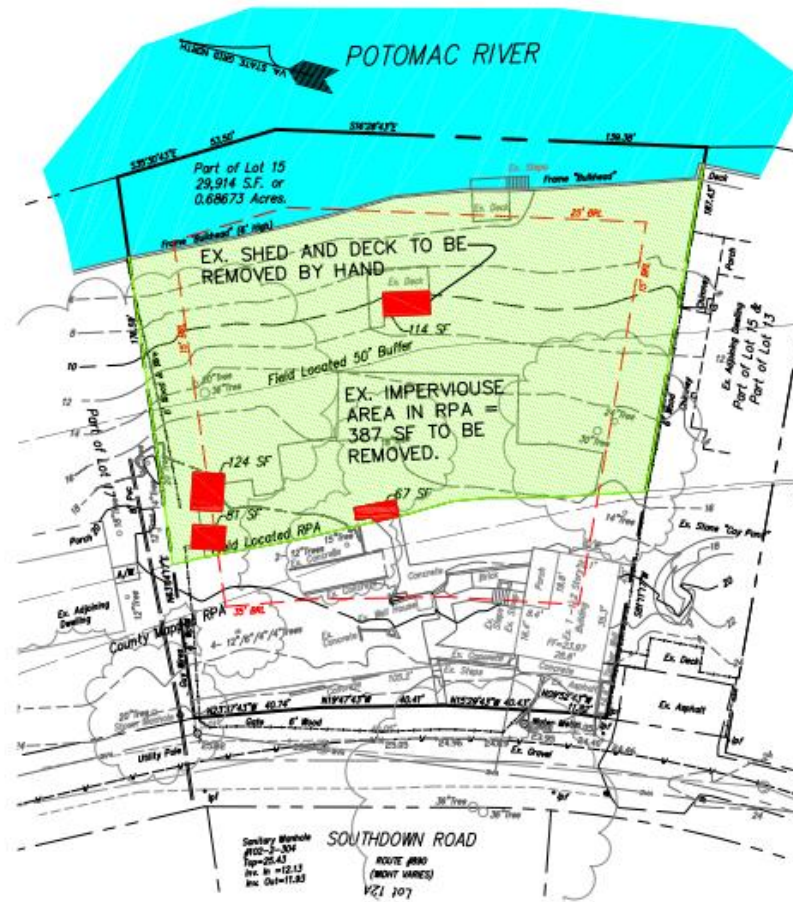


General Information

- **Lot Recorded on July 06, 1912**
- **Original house built in 1930**
- **Total lot area = 29,914 sf.**
- **Area of lot within the 1993 RPA= 21, 075 sf(70.5% of lot area)**
- **Total impervious area within the RPA at existing condition = 386 sf**
- **Total proposed impervious area within the RPA = 4,062 sf**
- **Net increase in impervious area within the RPA = 3,676 sf**
- **Is there an encroachment within 50' seaward side of RPA- NO**
- **FRMA Flood Hazard Area Zone AE exist at the lower side of the lot. No land disturbance proposed with the floodplain.**
- **Served by Public Sewer**

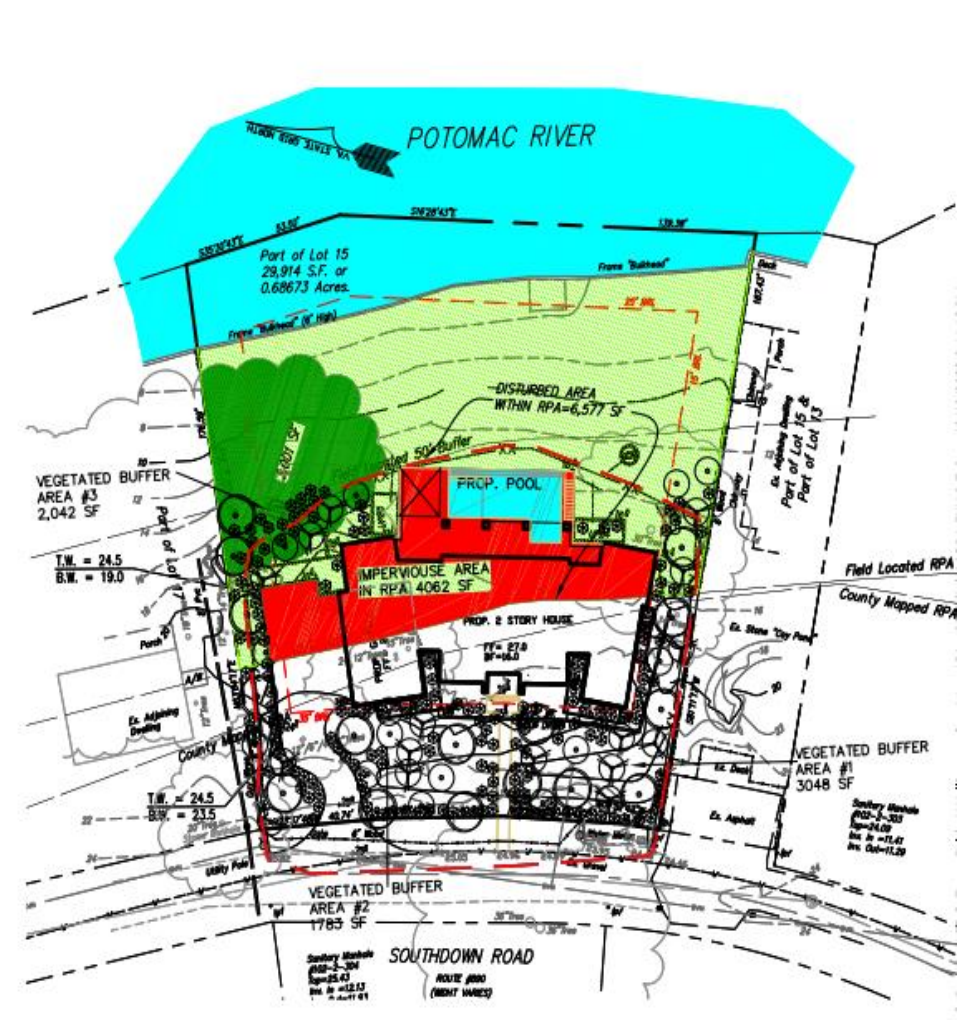
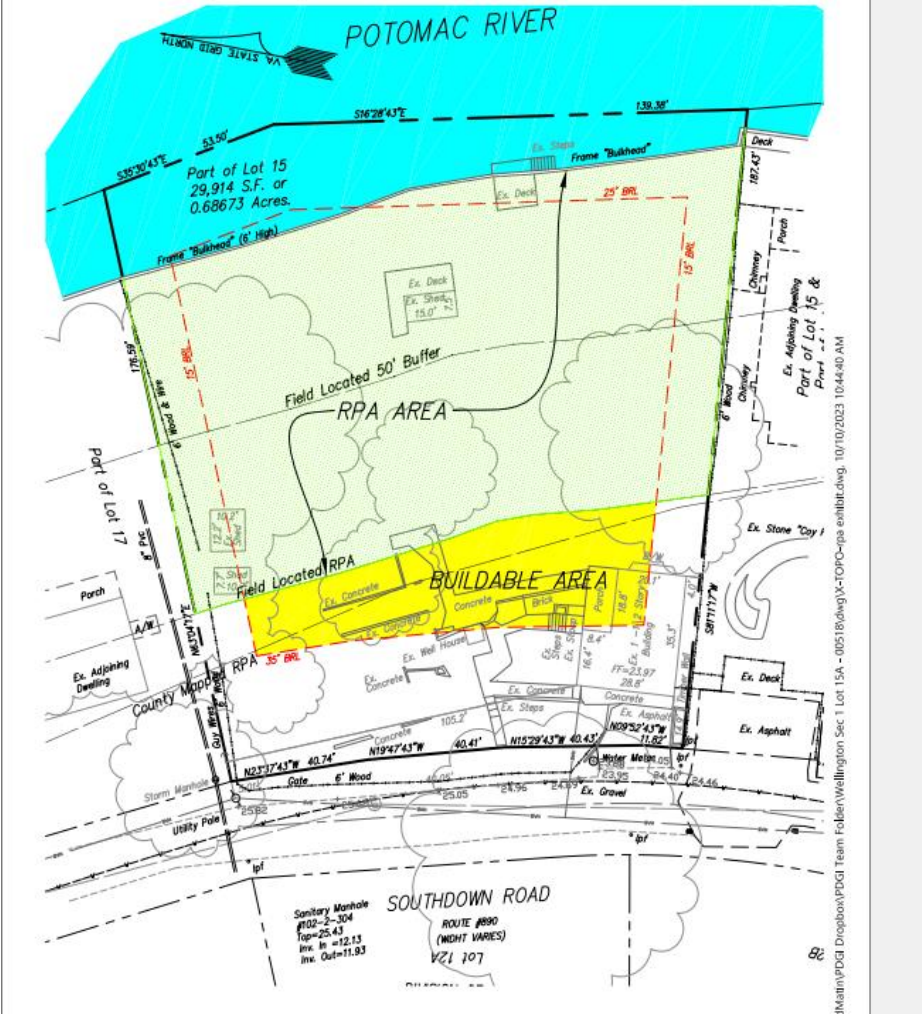


Existing Condition Impervious Area Map



Existing Condition

Proposed Condition



Summary of the application

This application was submitted under CBPO Section 118-6-9.

More than 70% of the property is within the RPA.

The total disturbed area within the RPA will be 6,577 square feet.

Total impervious area within the RPA at existing condition = 386 sf

Total proposed impervious area within the RPA = 4,062 sf

Net increase in impervious area within the RPA = 3,676 sf

The development will require 0.24 lb/year of phosphorus removal, but the application provides 0.26 lb/yr removal.

The applicant is proposing urban planter boxes to capture and treat the runoff from the roof area

The request includes to permit a single-family residence with a swimming pool in the RPA which cannot be processed under the provisions of CBPO Section 118-5-4(a) as the swimming pool does not qualify under Chapter 118-5-4(a).



Applicant Statement



Statements of other parties

Public Comment: Statements in support, followed by statements of opposition, followed by any other interested parties.



Position of the Director



Section 118-6-6. Required Findings

The application must meet the required findings, and the additions criteria of 118-6-9 to provide additional water quality benefits must exceed detriments.



a) The requested exception to the criteria is the minimum necessary to afford relief

- The application meets the minimum necessary to afford relief for all the uses except for the swimming pool. The total impervious area proposed by this application is less than what is allowed by Loss of Buildable Area (LOBA) under Section 118-5-4(a) of CBPO. Further, this plan does not propose encroachment within 50 feet of seaward side of the RPA. It is the Reviewer's opinion that the total impervious area proposed within the RPA (4,062 sf) is less what is allowed under LOBA (5,000 sf) and the encroachment can be considered minimum necessary to afford relief



b) Granting the exception will not confer upon the applicant any special privileges

- For a parcel recorded prior to October 1, 1989, applications with impervious area greater than 4,062 sf have been previously approved administratively under the LOBA criteria. This application does not disturb the 50' of seaward side of the RPA.
- Also, 7727 Southdown Road has a swimming pool in the RPA. The WRPA 005775-WRPA-004-1 was approved on 07/01/1994.
- It is the opinion of the staff that approving this application will not confer upon the applicant any special privileges that are denied by this part to other property owners who are subject to its provisions and who are similarly situated.



C) The exception is in harmony with the purpose and intent of this Chapter and is not of substantial detriment to water quality;

- This application has proposed vegetated buffers (6,873 sf) greater than the area disturbed within the RPA (6,577 sf) which will help to improve the quality of runoff leaving the site. Total 16 large canopy trees, 32 under-story trees, and 172 shrubs are proposed to create the buffer area. VRRM spreadsheet illustrates this application provides more water quality benefit than the minimum necessary required.



d) The exception request is not based upon conditions or circumstances that are self-created or self-imposed;

- Staff agrees that the conditions being considered are not self-created or self-imposed based on the available information.



e) Reasonable and appropriate conditions are imposed, as warranted, that will prevent the allowed activity from causing a degradation of water quality;

- Attachment A has been included with this staff report containing proposed conditions that will help to improve the water quality and aesthetics at this location.
- A vegetated buffer has been proposed in an area of at least 6, 873 square feet, by planting 16 Overstory trees, 32 Understory trees and 172 shrubs as shown on the application with the criteria of the Chesapeake Bay Preservation Ordinance (CBPO) 118-3-3(f).



f) Other findings, as appropriate and required herein, are met.

- 118-6-9 requires that the plan demonstrate a water quality benefit. Staff finds that the proposed development minimizes land disturbance in the RPA and meets all of the applicable zoning requirements. We will enforce all conditions and required water quality treatments through the Infill Lot Grading Plan process
- If it were the direction of this Committee, it may be a water quality improvement for a buffer area to be established between the use and the river, in the seaward 50' of the RPA. LDS could enforce such a condition at time of INF for planting equal in area to be more optimally located, per 118-3.3.d.



Water Quality Benefit Analysis

DEQ Virginia Runoff Reduction Method Re-Development Compliance Spreadsheet - Version 3.0
BMP Design Specifications List: 2013 Draft Side & Specs

Site Summary
Project Title: Wellington Estates Lot 15A
Date: 4/28/23

Total Runoff (in):	43
Total Disturbed Acreage:	0.42

Site Land Cover Summary

Pre-ReDevelopment Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals	% of Total
Forest/Open (acres)	0.00	0.00	0.00	0.00	0.00	0%
Managed Turf (acres)	0.00	0.00	0.00	0.63	0.63	91%
Impervious Cover (acres)	0.00	0.00	0.00	0.06	0.06	8%
					0.69	100%

Post-ReDevelopment Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals	% of Total
Forest/Open (acres)	0.00	0.00	0.00	0.00	0.00	0%
Managed Turf (acres)	0.00	0.00	0.00	0.52	0.52	75%
Impervious Cover (acres)	0.00	0.00	0.00	0.17	0.17	25%
					0.69	100%

Site Tn and Land Cover Nutrient Loads

	Final Post-Development (Post-ReDevelopment & New Impervious)	Post-ReDevelopment (New Impervious)	Post-Development (New Impervious)	Adjusted Pre-Development
Site Rv	0.42	0.32	0.55	0.31
Treatment Volume (H ³)	1,055	679	379	675
TP Load (lb/yr)	0.66	0.43	0.24	0.41

Total TP Load Reduction Required (lb/yr)

Required	0.24	0.04	0.19
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TN Load (lb/yr)	1.90	1.50	1.50
Final Post-Development load (Post-ReDevelopment & New Impervious)	0.26		
Pre-Development		1.30	

Site Compliance Summary

Maximum % Reduction Required Below Pre-ReDevelopment Load	10%
Total Runoff Volume Reduction (H ³)	358
Total TP Load Reduction Achieved (lb/yr)	0.26
Total TN Load Reduction Achieved (lb/yr)	1.90
Remaining Post-Development TN Load (lb/yr)	0.41
Remaining TP Load Reduction (lb/yr) Required	0.00

** TARGET TP REDUCTION EXCEEDED BY 0.02 LB/YEAR **

Drainage Area Summary

	D.A. #	D.A. E	D.A. I	D.A. B	D.A. E	Total
Forest/Open (acres)	0.00	0.00	0.00	0.00	0.00	0.00
Managed Turf (acres)	0.00	0.00	0.00	0.00	0.00	0.00
Impervious Cover (acres)	0.13	0.00	0.00	0.00	0.00	0.13
Total Area (acres)	0.13	0.00	0.00	0.00	0.00	0.13

Drainage Area Compliance Summary

	D.A. #	D.A. E	D.A. I	D.A. B	D.A. E	Total
TP Load Reduced (lb/yr)	0.26	0.00	0.00	0.00	0.00	0.26
TN Load Reduced (lb/yr)	1.50	0.00	0.00	0.00	0.00	1.50

Drainage Area A

Practice	Length (ft)	Width (ft)	Area (sf)	Flow (cfs)	Velocity (ft/s)	Detention (min)	Flow (cfs)	Velocity (ft/s)	Detention (min)	Flow (cfs)	Velocity (ft/s)	Detention (min)	Flow (cfs)	Velocity (ft/s)	Detention (min)
Grass	100	10	1000	0.1	1.0	10	0.1	1.0	10	0.1	1.0	10	0.1	1.0	10
...

Summary of Total Nitrogen load before and after redevelopment without considering on-site treatment practices.

TOTAL PRE-DEVELOPMENT LOAD (lb/yr)	1.90
TOTAL POST-DEVELOPMENT LOAD (lb/yr)	1.50
TOTAL NITROGEN REDUCTION (lb/yr)	0.40

The resulting requirement is the sum of reductions required from existing imperviousness and new imperviousness calculations, rounding to hundreds to built into the spreadsheet.

The 0.24 lb/yr requirement includes reducing the new imperviousness and reducing nutrient runoff from the existing imperviousness.

Practice	Length (ft)	Width (ft)	Area (sf)	Flow (cfs)	Velocity (ft/s)	Detention (min)	Flow (cfs)	Velocity (ft/s)	Detention (min)	Flow (cfs)	Velocity (ft/s)	Detention (min)	Flow (cfs)	Velocity (ft/s)	Detention (min)
Grass	100	10	1000	0.1	1.0	10	0.1	1.0	10	0.1	1.0	10	0.1	1.0	10
...

Summary of Total Nitrogen load before and after redevelopment without considering on-site treatment practices.

TOTAL PRE-DEVELOPMENT LOAD (lb/yr)	1.90
TOTAL POST-DEVELOPMENT LOAD (lb/yr)	1.50
TOTAL NITROGEN REDUCTION (lb/yr)	0.40

The redevelopment version of the VRRM spreadsheet requires a phosphorus reduction below existing values for existing impervious areas.

The impact of new impervious area has a different treatment requirement than the existing impervious area. Non-area must be treated as the resulting runoff load of phosphorus is down to a baseline level of 0.41 lb/yr.

Update Summary Sheet
Total Preview Print

MARKUP BY: M. HANSEN 11/07/2023

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SCALE: -
JOB NO.: 00518
DRAWING NO: 518-R24-R
SHEET 4 of 4

Note: The "VRRM" method is preferred method by DEQ because it standardizes this calculation process, including calculation of benefits provided by certain water quality practices. For redevelopment cases that includes a required reduction in nutrient runoff from existing surfaces (or an equivalent area of existing surfaces in the case like this total redevelopment).

The applicant complies with required reductions dictated by the redevelopment version of this spreadsheet, providing a water quality benefit.

The applicant then provides in total 0.26 lb/year of phosphorus reduction, just a bit more than the 0.24 lb/year required, providing a small but demonstrable water quality benefit.

In addition to this this application has proposed vegetated buffers (6,873 sf) greater than the area disturbed within the RPA (6,577 sf) which will help to improve the quality of runoff leaving the site. Total 16 large canopy trees, 32 under-story trees, and 172 shrubs are proposed to create the vegetated buffer area.

Rebuttal by Applicant



Surrebuttal by Staff



Closure of Public Hearing



Contact Information

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