

**#\_\_**26

# BOARD OF SUPERVISORS <u>Agenda Item</u>

Meeting Date:	June 20, 2017
Title:	Consider a Request for Reclassification from the A-1, Agricultural Zoning District to the R-1, Suburban Residential Zoning District on Tax Map Parcel No. 29-4
Department:	Planning and Zoning
Staff Contact:	Jeffrey A. Harvey
Board Committee/ Other BACC:	Planning Commission
Staff Recommendation:	Approval
Budget Impact:	N/A
Time Sensitivity:	June 29, 2017 to Comply with the One-Year Deadline for Action

## **ATTACHMENTS:**

1.	Background Report	8.	Architectural Renderings
2.	Proposed Ordinance 017-02 (Approve)	9.	Traffic Impact Analysis
3.	Proposed Resolution R17-09 (Deny)	10.	Market and Fiscal Analysis
4.	Land Use Action Request	11.	Environmental Studies
5.	Summary of Application Changes	12.	Application and Related Materials
6.	Proposed Proffers dtd 5/24/17 (clean and	13.	PC Minutes dtd 9/28/16 and 10/26/16
	red-lined version)		
7.	Generalized Development Plan dtd 4/27/17		

Consent Agenda	Other Business	X	<b>Unfinished Business</b>
Discussion	Presentation	3. T.C.	Work Session
New Business	Public Hearing		Add-On

## **REVIEW:**

X	County Administrator	Thomas C. Joley
Х	County Attorney (legal review only)	Harley Shumato

DISTRICT: Garrisonville and Rock Hill

Attachment 1 017-02

## **BACKGROUND REPORT**

Winding Creek Owner, LLC (Applicant) is requesting a reclassification from the A-1, Agricultural Zoning District to the R-1, Suburban Residential Zoning District, to allow for a higher intensity residential development on Tax Map Parcel No. 29-4 (Property), which totals 61.23 acres. The current zoning classification of A-1 would allow approximately 20 single-family homes on three-acre lots. Reclassification to the R-1 Zoning District could result in approximately 91 residential lots on the Property. The Applicant concurrently submitted an application for a conditional use permit (CUP) for additional density under the cluster provisions, which could result in a density up to 2.25 dwelling units per acre. The Applicant is requesting 97 single-family units total in the CUP.

At its meeting on January 24, 2017, the Board conducted a public hearing for the applications, and the items were deferred based on transportation concerns voiced by nearby residents. Proposed changes to the application since the public hearing are noted in this report.

In 2014, similar applications for a rezoning and a CUP were submitted and processed for this proposed development. The application included a second parcel, Tax Map Parcel No. 29-5C, consisting of 1.90 acres, which abutted the east side of Parcel 29-4 and the western terminus of Fireberry Boulevard in the Autumn Ridge neighborhood. Parcel 29-5C was omitted from this new application, primarily to remove the Virginia Department of Transportation (VDOT) requirement for inter-parcel street connection to Fireberry Boulevard. During the public hearing process for the 2014 applications, the residents expressed opposition to the connection. At its meeting on September 1, 2016, the Board denied the rezoning application, and took no action on the related CUP. The new proposal on 61.23 acres is very similar to the original proposal on 63.13 acres, but has been modified slightly based on the new acreage. The proposed number of dwelling units has not changed. A summary of changes between the current and previous rezoning application is included in Attachment 5.

## **Existing Conditions**

The Property is located at the intersection of Winding Creek Road and Embrey Mill Road and is surrounded by



single-family residential uses. One single-family residence exists on the Property. An existing underground electric power utility easement transects the southern portion of the Property. Winding Creek Road transects the western portion of the Property and Austin Run transects the northern portion of the Property from west to east.

The Property includes areas of medium-aged mixed deciduous and coniferous forest. Austin Run flows through the northern portion, which is protected by a critical resource protection area (CRPA) buffer. Major portions of the Property are dominated by relatively young regrowth where Virginia pine trees are prevalent. There are areas of mature hardwood forest, consisting of white oak, southern red oak, American beech, and hickory trees, with diameter-at-breast-height (DBH) greater

than 12 inches. These areas would remain predominantly within the designated open space areas as depicted on the Generalized Development Plan (GDP) (Attachment 7).

A threatened and endangered species review, dated April 25, 2014, and a small whorled pogonia survey (Survey), dated July 31, 2013, was completed on the Property; the result of which was a determination of "low" on the potential of occurrences or impacts related to listed species. Areas of potential suitable habitat were identified during the Survey of the proposed development site for the small whorled pogonia, which is an orchid that is a State-listed endangered and Federal-listed threatened plant species. However, during the Survey, there were no individuals or colonies that were observed or identified on, or immediately adjacent, to the Property. Copies of the environmental studies are included in Attachment 11.

## **Generalized Development Plan**

The GDP, dated August 29, 2016, last revised April 27, 2017, depicts the proposed design of the site to include 97 lots at a density of 1.58 dwelling units per acre (du/ac), assuming issuance of the CUP. Without the CUP, only 91 lots would be permitted. The proposed development identifies 33.29 acres, or 54.4% of the Property, as common open space, well above the 30% minimum requirement. All residential units would be located on the portion of the Property to the east of Winding Creek Road. Build-out of the proposed neighborhood is projected to occur by 2021. The general layout of the development has not changed since the Board's January 2017 public hearing, however Page 11 of the GDP has been revised to show new road improvements, discussed later in this report in the transportation section.



Generalized Development Plan

The GDP identifies that the proposed development will have two access points to Winding Creek Road. Secondary access is shown via an inter-parcel connection in the vicinity of Wet Rock Lane, to the south of the development. The Applicant proffered the construction of a sidewalk to Winding Creek Road, and a crosswalk connecting the east and west side of Winding Creek Road, providing pedestrian access to Open Space Parcel E, located on the west side of Winding Creek Road. This is consistent with Comprehensive Plan Policy 6.3.1., which states that development proposals should establish sidewalks to connect local neighborhoods with activity centers.

The Applicant proffered that Parcel E, consisting of 10.326 acres, would be preserved as open space and not developed or disturbed, except potentially for County park purposes. The proffers further state that Parcel E may be dedicated to the County upon approval of the final subdivision plan for the first section of the neighborhood, unless the County does not desire to accept Parcel E. In that case, Parcel E would be placed in a conservation easement or conveyed as preserved open space to the homeowners association. The applicant has indicated that the fair market value of Parcel E is approximately \$913,875.

Staff with the Department of Parks, Recreation, and Community Facilities indicated that the proposed development will create an increase in demand. The Parcel E proffer and County Dedication would create additional demand on the County to maintain approximately 10.326 acres of land. Parcel E is wooded, so the County would become responsible for tree maintenance and any impact the trees may have on neighboring properties. The land dedication proposed would not offset any current need of the County that staff is aware of at this time. The proffer guidelines recommend \$6,303 per single-family dwelling unit, \$611,391 for this proposal, which would be more effective in addressing the needs of the community. In addition, Parcel E has a utility easement that would restrict the use and park improvements. Therefore, Parcel E would not meet the community's needs as outlined in the County's Parks Utilization Study.

The proposed development would result in clearing approximately 34 acres of forested area. Staff recommended that existing tree canopy be protected and/or restored to the greatest extent possible. Comprehensive Plan Policy 3.5.2., states that the maximum amount of tree cover on developed and developing sites shall be protected or restored, and also with Section 200 of the design and construction standards for landscaping, buffering, and screening (DCSL), which states that buffer yards are intended to "recreate or preserve native woodlands." In addition to the forested area encompassed within the common open space areas, the proposal includes a proffered 20-foot and variable width buffer consisting of a double row of evergreen trees between the residential lots and the right-of-way along Winding Creek Road. The Applicant also proffered to provide a tree in the rear of each lot.

The open space parcels encompass a Virginia Dominion Power easement, which transects the southern portion of the Property, and jurisdictional wetlands. The GDP shows minor impacts to wetlands and streams that are not protected by the CRPA buffer, because they are not contiguous or connected by surface flow to a perennial stream. However, these would be within the maximum thresholds under the State's permitting process. The Applicant proffered that for all future property owners abutting the Virginia Dominion Power easement shown on the GDP, a disclosure notice will be provided to each buyer identifying the fact that in the future, overhead power lines may be constructed, in addition to the existing underground line within the Virginia Dominion Power easement.

## **Transportation**

A Transportation Impact Analysis (TIA) (Attachment 9) was submitted to the County, and although not required, the TIA was submitted to VDOT for review. The TIA was originally prepared in 2014, and was amended on June 13, 2016 to accommodate for the change in street layout resulting from the elimination of the Fireberry Boulevard connection. The revised TIA did not result in any new recommendations or conclusions. Minor modifications include updated 2014 traffic data projected to 2016 for analysis purposes.

The TIA included assessment of the following intersections:

- Winding Creek Road/Embrey Mill Road
- Eustace Road/Live Oak Lane/Middle School Entrance
- Eustace Road/Northampton Blvd/Hampton Park Road
- Winding Creek Road/Site Entrance #1 (North)
- Winding Creek Road/Site Entrance #2 (South)

The TIA concluded that 2021 traffic conditions with the buildout of the proposed Winding Creek neighborhood would be adequately accommodated at the study intersections with no offsite improvements.

The Comprehensive Plan identifies a future upgrade to Winding Creek Road between Courthouse Road and Shelton Shop Road to an "urban two-lane major local standard," which recommends minimum 11-foot travel lanes, five-foot shoulders, curb and gutter, and a five-foot sidewalk. Winding Creek Road is not currently identified in the FY2016 Capital Improvement Program (CIP) for improvement within the next ten years.



Urban Two Lane Major Local Standard

The Applicant is proposing to dedicate 0.84 acre of right-of-way along both sides of Winding Creek Road to achieve 60 feet in width, as required by County Code Sec. 28-256(c)(1). The TIA identifies the intersections on Winding Creek Road operating at a Level of Service (LOS) A and B in 2021, and does not show a need for an increase to capacity. The Applicant has proffered to construct a 100-foot right turn taper/200-foot deceleration lane and a 100-foot taper/100-foot acceleration lane at the southernmost subdivision entrance on Winding Creek Road. In addition, the Applicant has proffered to construct improvements along Winding Creek Road from the northernmost entrance to the intersection of Winding Creek Road and Flatford Road/Walpole Street. This includes two widening and paving the two travel lanes to 24 feet, with six-foot graveled shoulders on both sides of the road, and ditches (see typical section below). The current pavement width varies from 18 feet to 20 feet, with minimal gravel shoulders. The road widening details along Winding Creek Road are shown on Page 11 of the GDP. These improvements are referenced in revised Proffer #4(c) (Attachment 6), and are proposed in response to concerns for nearby residents regarding the safety of Winding Creek Road. Staff notes that the GDP does not depict curb and gutter, as recommended in the Comprehensive Plan, and identifies "future sidewalk" along the property frontage, but there is no commitment for sidewalk construction.



Proposed Typical Section

The improvements also include removal of a large rock outcrop and grading at the curve located approximately 530 feet north of the subject site to improve the sight distance for vehicles traveling through the curve. These improvements would be contingent upon concurrence of a third-party property owner for easements and right-of-way acquisition. In the event that the third-party concurrence is not obtained, the equivalent cash value would be paid to the County as transportation proffers.

The improvements have a stated value of approximately \$1,000,000. If the Applicant is unable to acquire or obtain the necessary right-of-way or easements for the improvements, the Applicant may request that the County condemn the necessary areas, and the Applicant would bear all the costs of condemnation. If the necessary rightof-way/easements are not obtained with six months of the applicant providing necessary documents for condemnation, the applicant would instead pay a total of \$1,000,000 in transportation cash proffers, \$10,309, payable per residential unit prior to the issuance of each occupancy permit. In the event that necessary right-ofways/easements are obtained by the Applicant, the stated improvements would be complete prior to the issuance of the 21<sup>st</sup> occupancy permit for the project.



Winding Creek Curve Improvement

The TIA identifies an increased delay of approximately five seconds and an additional 13 feet in queuing for the intersection of Eustace Road, Northampton Boulevard, and Hampton Park Road, which will continue to operate at a LOS E. The Comprehensive Plan states that the LOS of the existing network should be maintained at LOS C or better. It is further stated that where LOS C cannot be attained, development applications should be evaluated by non-degradation and offsetting impact policies as described in Chapter 4 of the Comprehensive Plan:

"The Non-Degradation Policy requires applicants to ensure that the transportation system affected by the application performs no worse after the project is developed than it would otherwise. This approach is primarily a performance based approach which requires applicants to provide improvements or other guarantees to maintain certain performance levels. The Offsetting Impact Policy requires the applicant to contribute to transportation improvements proportional to the trips generated by the project and the amount of capacity required to accommodate those trips."

In the original proposal, the Applicant proffered to construct a right-turn lane at the intersection of Eustace Road and Northampton Boulevard. Analysis has not been submitted to verify that the proposed 100-foot turn lane is sufficient to mitigate the delay. Based on the lack of analysis, and the additional revised monetary proffers dedicated to improvements on Winding Creek Road, the Applicant has removed this proffer.

Staff notes that future lots would be subject to transportation impact fees in the amount of \$2,999 per lot, or \$290,903 total for the development. The Applicant may request a credit against the impact fees for off-site improvements, which would be evaluated during permit review.

## Comprehensive Plan

The Comprehensive Plan identifies this site as being within the suburban future land-use designation. The proposed development is generally consistent with the recommended development standards for the designation as described in the Comprehensive Plan.

- The average lot size within the proposed development of 0.18 acre is consistent with the cluster design, which permits a smaller lot size to cluster development away from open space areas, although it is less than the typical ¼ to ½ acre lot size consistent with the suburban scale of development of single-family detached dwelling units.
- The site is surrounded by developed parcels to the north, east and south. The proposed development would have direct access to Winding Creek Road, an urban local roadway which connects Courthouse Road to Embrey Mill Road and Walpole Street. This is consistent with infill development as described in the Comprehensive Plan to be located in the proximity of the established communities in the northern and southern areas of the County, and in close proximity to major existing or planned transportation networks.
- The proposed development is consistent with the Comprehensive Plan in that it reflects a density of 1.58 du/ac. It includes pedestrian connectivity to Parcel E, which will be preserved and may be used for recreational purposes, and includes 54 percent open space. Development densities within the Suburban future land-use designation should not exceed three du/ac for residential development. Sidewalks and pedestrian trails should be located within neighborhoods, and provide access between residential and non-residential uses, and developments are encouraged to preserve 25 to 50 percent of the site for a combination of natural and usable open space.

- Preservation of unique or sensitive environmental features should be incorporated into development design. The Comprehensive Plan states that the use of innovative development techniques including clustering are encouraged to allow for development with minimal impact on sensitive natural resources. The lots are located outside of the CRPA buffer; mature forest is located in the common open space area; and the jurisdictional wetlands are located on Parcel E.
- The NDS identify specific architectural guidelines for all new residential development. The Applicant proffered a commitment to a general design type, as illustrated in Exhibit B of the GDP, entitled "Renderings." The examples are consistent with the standards related to variations in roof lines, and the consistency of mass and scale within the development; front porches are also show, along with sidewalks within the subdivision that contribute to an inter-connected network of sidewalks. The Applicant included additional specificity within the proffer statement addressing building materials and the treatment of unadorned wall planes.
- Additionally, the Comprehensive Plan states that buffering should be required along major arterial and collector roads to limit road noise in residential areas. The Applicant is proposing a 20-foot and variable width buffer of a double row of evergreen trees between residential lots and Winding Creek Road.
- The Comprehensive Plan identifies a future upgrade to Winding Creek Road between Courthouse Road and Shelton Shop Road to an urban two-lane major local standard. The Applicant is dedicating the right-of-way to achieve 60 feet in width to accommodate future improvements, but has not committed to upgrading the roadway. The Applicant is proffering the construction of improvements to Winding Creek Road, including a deceleration lane at the southern entrance of the neighborhood from Winding Creek Road, as well as clearing and grading improvements along Winding Creek Road, at the curve located approximately 530 feet north of the subject site, to improve the site distance for vehicles traveling through the turn.

In addition to the above recommendations, Policy 1.2.12 of the Comprehensive Plan recommends that approval of cluster subdivisions with increased density should meet the following criteria:

- Cleared natural resource area should be restored through the provision of increased landscaping in open space, buffer areas and on residential lots.
- Viable areas of existing agricultural uses and natural resources should be avoided when possible as part of the development design.
- Subdivisions should be located in areas of the County where public facilities (including schools, transportation, parks and recreation, water/sewer, emergency services) have planned capacity to absorb the demand of the additional density.
- Impacts of the development should be mitigated where existing public facilities are inadequate.
- Environmentally sensitive areas should be preserved within open space areas, including wetlands, floodplain, alluvial soils, slopes greater than 25%, designated trees and significant tree stands.
- Open space areas should be a continuous land mass that is not fragmented by the development of the subdivision and shall be of sufficient size and shape to support its intended use.
- The minimum side yard setback for each residential lot should be ten (10) feet or a fire suppression system should be provided within each dwelling unit.

This Project generally meets these criteria.

## Impacts to Public Facilities

- Utilities: The Property is located within the Urban Services Area (USA), and would be served by the County's public water and sewer system. The proposed development would create demand for 29,100 gallons per day (gpd) for water and 23,280 gpd for sewer. This is an increase of 22,800 gpd and 18,240 gpd, respectively, over the demand if developed by-right.
- Transportation: Winding Creek Road is a two-lane undivided urban local roadway with an estimated traffic volume of 2,100 vehicle trips per day (VPD) between Flatford Road and Embrey Mill Road, according to VDOT's 2015 Daily Traffic Volume Estimates.
- The Comprehensive Plan identifies a future upgrade to Winding Creek Road between Courthouse Road and Shelton Shop Road to an "urban two-lane major local standard." The proposed development would contribute 1,021 VPD, which is an increase of 771 VPD compared to the 250 VPD if developed by-right.
- Stormwater Management: The development would result in approximately 11.50 acres of impervious area, whereas by-right development would likely result in 4.5 acres of impervious area.
- Schools: The proposed development would generate approximately 64 primary and secondary students utilizing the County-wide average of 0.66 students per unit, including 0.26 elementary students, 0.16 middle school students, and 0.24 high school students. By-right development would generate 13 students. Students generated by this development would attend Winding Creek Elementary School, Rodney Thompson Middle School, and North Stafford High School. Staff notes that in March 2017, the area of the proposed Winding Creek neighborhood was redistricted from Colonial Forge High School to North Stafford High School. The Applicant has identified a cash proffer amount of \$1,266,923 (\$13,061.06 per unit) for Stafford County Public Schools to mitigate impacts. The table below identifies school capacities and enrollments as of May 2017 for the 2016/17 school year:

School	Design	2016/17 Student	2016/17 Percent	Available
	Capacity	Enrollment	Capacity	Seats
Winding Creek ES	925	882	95%	43
Rodney Thompson MS	1,100	964	88%	136
North Stafford HS	2,050	1,655	81%	395

<u> </u>		<b>a</b>
School	Enrollments	vs. Capacities

- Fire and Rescue: The proposal is within the service response area of Fire Station #14 (Garrisonville). The Applicant has identified a cash proffer amount of \$74,151 (\$764.44 per unit) for Fire and Rescue.
- Parks and Recreation: Utilizing the Parks and Recreation LOS of 20 acres per 1,000 residents, the proposed development would create a demand for five acres of land for parks and recreation. By-right development would generate a demand for approximately one acre. The Applicant has not identified a cash proffer amount for Parks. Staff notes that the proffer statement includes the dedication of 10.3 acres of open space to a future Home Owners' Association or the County for recreational purposes, if the County chooses to accept it.

## Fiscal Impacts

The Applicant submitted a fiscal impact analysis (FIA) of the proposed project, prepared by S. Patz and Associates, Inc., dated May, 2014 (Attachment 10). The FIA generally concludes that for purposes of complete build-out, the project would generate the following net benefit annually:

<b>Total Fiscal Impacts</b>	On-site	Off-site	Total
Total Tax Revenue	\$754,890	\$421,280	\$1,176,170
Tax-supportable Costs	-\$669,770	-\$149,010	-\$818,780
Net Fiscal Benefit	\$85,120	\$272,270	\$357,390

An alternate scenario was provided in the FIA based on various student generation rates, as follows:

Table 11. On-site, Off-site and Total Net Fiscal Impacts for Winding Creek Under Three Alternative Pupil Generation Rate Scenarios (constant \$2014).					
	On Site Impacts	Off-site Impacts	Total Impacts		
County Average Scenario 1/					
Total Tax Revenues	\$754,890	\$421,280	\$1,176,170		
Less: Tax-supported Costs	<u>-\$481,160</u>	<u>-\$149,010</u>	<u>-\$630,170</u>		
Net Fiscal Benefit	\$273,730	\$272,270	\$546,000		
New Subdivisions Scenario 2/					
Total Tax Revenues	\$754,890	\$421,280	\$1,176,170		
Less: Tax-supported Costs	<u>-\$669,770</u>	<u>-\$149,010</u>	<u>-\$818,780</u>		
Net Fiscal Benefit	\$85,120	\$272,270	\$357,390		
High Generation Scenario 3/					
Total Tax Revenues	\$754,890	\$421,280	\$1,176,170		
Less: Tax-supported Costs	<u>-\$782,930</u>	<u>-\$149,010</u>	<u>-\$931,940</u>		
Net Fiscal Benefit	-\$28,040	\$272,270	\$244,233		
1/ At 0.66 pupils per household.					
3/ At 1.30 pupils per household					
Sources: Stafford County and S. Patz & Associates, Inc.					

Staff notes that the County-wide average impact on sales prices for single-family homes is +\$429.51 per home, based on a study prepared for the 2010 Comprehensive Plan. That impact is based on the average sales price of a single-family home in the County and is not reflective of the sales prices of homes within the proposed development. The Applicant estimates a positive fiscal impact to be \$2,517.84 for each home given the total impact cost of \$244,230 divided by the 97 proposed single-family homes to be built.

## Monetary Proffers

Staff notes that this application was submitted on June 29, 2016, prior to the effective date of July 1, 2016, when residential proffer legislation was amended pursuant to Virginia Code § 15.2-2303.4. Therefore, the December 15, 2015 proffer guidelines remain in effect for this application.

A proffer statement was submitted with this application, and was subsequently revised based on input at the Board's January 2017 public hearing. Attachment 6 contains a clean version and red-lined version showing proffer modifications. Monetary proffers include per-unit contributions of \$14,840.80 (or \$1,439,557 total) for schools, libraries, fire and rescue, and general government. This amount is below the guideline of \$48,342 for single-family homes. The proffer statement includes a monetary proffer of \$1,000,000 in cash or cash equivalency for transportation improvements to Winding Creek Road. Additionally, the Applicant has proposed monetary proffers in the amount of \$530,000, including a \$30,000 donation to Belmont Museum in Falmouth and a \$500,000 donation to the County's Purchase of Development Rights (PDR) program. The PDR donation would be paid in \$50,000 increments at the issuance of occupancy permits for every 10 residential units, with the \$300,000 balance due at the issuance of an occupancy permit for the 50<sup>th</sup> residential unit. Staff notes that the PDR donation is referenced as a gift in the proffers and would not be enforceable. The proffer notes that if the Applicant fails to make the PDR donation, a proffer obligation will be triggered in the amount of \$600,000 payable to the County upon the issuance of the 51<sup>st</sup> occupancy permit. The cash proffer would be enforceable and could be applied to public schools, transportation, parks and recreation, fire and rescue, and/or other capital facilities programs. If, however, only 50 homes are issued occupancy permits, there is no means for the County to require the payment.

The following table shows a comparison of the proposed proffers to the current guidelines, based on the per-unit proffer amount:

Total Units	97
By-Right Units	20
New Development Units	77
Proposed Proffers Per Unit	\$14,840.80
Proffers per Unit for New Development Units	\$18,695.55
Proffer Guidelines Recommendation (at time of application submittal)	\$48,342.00

## Proffer Summary

The Applicant submitted the following proffers, which would:

- Require the subdivision to be developed in general accordance with the GDP, but would allow for specified modifications in the final site plan;
- Provide a commitment to a general type, character, and quality of architectural design, details and materials of the units, and of an entrance feature, including:
  - Front elevation of 75% of units would be 60% brick, natural stone or cultured stone;
  - Side elevations facing the street on corner lots would have two operable windows;
  - All units would have brick or stone to grade on any side facing the street; and
  - Roofs would be symmetrically sloped no less than 5:12, except porches and attached sheds.
- Require the dedication of 0.84 acre of right-of-way along Winding Creek Road without compensation or credit;
- Require the dedication of 0.78 acre of right-of-way for the relocation of Embrey Mill Road, as an in-kind transportation proffer contribution and without compensation;

- Require the construction of right turn tapers and acceleration lanes off of Winding Creek Road into the southernmost entrance of the project;
- Require construction of road improvements along Winding Creek Road from the northernmost entrance to the intersection of Winding Creek Road and Flatford Drive/Walpole Street. This will include widening and paving the travel lanes to 24 feet, with six-foot graveled shoulders on both sides of the road, and constructing site line improvements at the curve located roughly 530 feet north of the northern limit of the project, or require payment in lieu of the improvements. The Applicant may request the County to condemn the property necessary for improvements, at the applicant's expense;
- Require the construction of an internal sidewalk to Winding Creek Road and a crosswalk connecting the east and west sides of Winding Creek Road;
- Require the preservation of approximately 10.326 acres of land (Open Space Parcel E), which may be used for County recreation purposes, and require dedication to the County upon recordation of the first subdivision section, unless the County does not desire to accept Open Space Parcel E. If not accepted by the County, Open Space Parcel E will be conveyed to the homeowner's association for preservation;
- Require cash proffers of \$14,840.80 per unit for schools, libraries, fire and rescue, and general government (note that \$650,000 of the school proffers shall be set aside for North Stafford High School capital improvements within seven years of the approval of the proffer statement);
- Require the property to be encumbered with conditions, covenants, restrictions, and easements prior to development, and the creation of a property/homeowners' association;
- Offer fire sprinkler systems as an option to purchasers of any dwelling units;
- On lots located within the CRPA buffer, require the installation of any required plant materials prior to the issuance of the certificate of occupancy, installation of a sign identifying the landward limits of the CRPA buffer, and provision of related deed restrictions;
- Require a Phase I Cultural Resource Study to be completed if historical artifacts are discovered during site development and a Phase II study, if required by the Phase I Study;
- Provide cash contribution of \$30,000 to Belmont museum for facility improvements or general museum purposes;
- Provide cash donation of \$500,000 to the County's PDR program;
- Limit the development to 97 single-family dwelling unitS (subject to the approval of the concurrent CUP application);
- Require a 20-foot buffer consisting of a double row of evergreen trees between residential lots, and the Winding Creek Road right-of-way on Open Space Parcels A and D;
- Require a variable width buffer consisting of a double row of evergreen trees between residential parcels and the Winding Creek Road right-of-way on Open Space Parcel C;
- Require foundation landscaping and at least one tree in the rear yard of each lot;
- Require the construction of a "tot lot" and picnic/pavilion area; and
- Require a landscape buffer between Lots 43/44 and the adjacent property owner, consisting of a double row of evergreen trees.

## Architectural Design

The Applicant submitted architectural renderings (Attachment 8) and proffered a commitment to a general type, character, and quality of architectural design, details and materials of the units. The following examples have been included as an attachment to the proffer statement:



Architectural Elevations











Architectural Elevations

## Evaluation Criteria

County Code Sec. 28-206 lists 12 criteria to be considered at each public hearing for reclassification.

- 1. Compliance of the request with the stated requirements of the district or districts involved. *The request is in compliance with the stated requirements of the R-1 Zoning District, if the separate CUP application is approved.*
- 2. The existing use and character of the property and the surrounding property. *The Property is currently vacant. The site contains forested area, wetlands and CRPA. Land surrounding the site is developed for residential uses.*
- 3. The suitability of the property for various uses. *The conditions of the site make it suitable for residential uses; special consideration has been given to avoid the sensitive natural resources that are present on the site, in accordance with the Comprehensive Plan.*
- 4. The trend of growth and development in the surrounding area. *The site can qualify as infill development, surrounded by single-family residential uses.*
- 5. The current and future requirements of the County for land. The proposed residential development takes into account the future upgrades to Winding Creek Road by dedicating the required right-of-way; approximately 10 acres of land is proposed for dedication to the County for recreational purposes, if the County accepts it.
- 6. The transportation requirements of the project and the County, and the impact of the proposed landuse on the County's transportation network. *The applicant has proffered improvements to Winding Creek Road, generally in accordance with the Comprehensive Plan, which identifies a future upgrade to Winding Creek Road between Courthouse Road and Shelton Shop Road to an "urban two-lane major local standard." The proposed improvements do not include sidewalk construction, as specified in the Comprehensive Plan. The road is currently not in the CIP for improvements in the next 10 years. The proposed development would contribute to an increased delay of approximately five seconds, and an additional 13 feet in queuing for the intersection of Eustace Road, Northampton Boulevard, and Hampton Park Road, which will continue to operate at a LOS E.*
- 7. Requirements for schools, parks, recreational lands and facilities, and other public services, potentially generated by the proposed classification. *The proposal would increase the impacts on parks, recreational lands, schools, and other public facilities. The monetary proffers include a per-unit contribution for Fire and Rescue, Libraries, Schools, and General Government. Other proffers include donation of open space lands to the County for park purposes, if desired by the County, and potential cash payment after the 50<sup>th</sup> occupancy permit for capital facilities to be applied at the Board's discretion.*
- 8. The conservation of property values in the surrounding area. The proposed development should not have a negative effect on any property values in the surrounding area. The development is compatible with the surrounding uses and is consistent with the surrounding residential form of development.

- 9. The preservation of natural resources and the impact of the proposed uses on the natural environment. The site contains sensitive natural resources including forested area, wetlands, and CRPA. The proposal takes measures to protect and/or restore a portion of the large amount of tree canopy proposed for removal, and the Applicant proffered to place appropriate signage on lots within the CRPA buffer to further protect that area.
- 10. The most appropriate use of land. The Land Use Plan recommends this as a suburban area. The proposed uses and development pattern meet the intent in the Comprehensive Plan for suburban areas, including the types of dwellings, density, proximity to major existing or planned transportation network, proposed pedestrian interconnectivity, and the amount of open space.
- 11. The timing of the development of utilities and public facilities, and the overall public costs of the development. *The area is served by existing water and sewer utilities. The Applicant would install any required transportation and utility improvements for the project at their expense. The development will generate a need for additional public services, which are partially mitigated through monetary proffers.*
- 12. The consistency, or lack thereof, of the proposed rezoning with the Stafford County Comprehensive Plan as in effect at that time. The proposal is generally consistent with the Comprehensive Plan recommendations regarding the suburban land-use recommendations and future transportation needs. The proposal utilizes the cluster design in order to avoid more than minimal impacts to wetlands, the stream channel and CRPA. A 20-foot buffer between the residential lots and right-of-way along Winding Creek Road would mitigate noise impacts from the two-lane undivided urban collector roadway. The project includes the protection of natural resources, in addition to the fractional restoration of tree canopy through additional landscaping materials, in accordance with the environmental protection policies in the Comprehensive Plan. The proposed project design and configuration meets the criteria for cluster subdivisions with increased density. The Applicant is proposing to upgrade a portion of Winding Creek Road in accordance with the Comprehensive Plan, except for the provision of sidewalk.

## Summary of Positive and Negative Features

Positive:

- 1. The proposal is consistent with the established development pattern in the vicinity.
- 2. The proposed uses and development pattern meet the intent of the Comprehensive Plan, including land use, building design, pedestrian connectivity, and open space recommendations.
- 3. The proposed right-of-way dedication and planned transportation improvements would enhance safety along this section of Winding Creek Road.

## Negative:

- 1. Monetary proffers are below the per-unit amount recommended in the Proffer Guidelines.
- 2. Road improvements are not fully compliant with the Comprehensive Plan recommendations for curb, gutter and sidewalk along Winding Creek Road

## **Recommendation**

Based on concerns from the nearby residents, several community meetings have been held regarding this application. Prior to the Board's January 2017 public hearing, the Applicant met with residents of Berkshire development. In addition, a community meeting with the Berkshire Homeowners' Association was held on December 8, 2016 to discuss issues raised from residents of Berkshire. In attendance were Supervisor Maurer, as well as representatives of the Applicant, and several staff members. On May 24, 2017, a town hall meeting was conducted with Supervisor Maurer and Supervisor Sellers, where nearby residents of the Berkshire and Autumn Ridge neighborhoods were invited to attend.

At its meeting on October 26, 2016, the Planning Commission voted 4-2 (Ms. Vanuch and Mr. Coen voted no, Mr. English abstained) to recommend approval of the application.

Staff is generally supportive of the application, and recommends approval of proposed Ordinance O17-02, which is a reclassification on Tax Map Parcel No. 29-4 from the A-1, Agricultural Zoning District to the R-1, Suburban Residential Zoning District.

#### PROPOSED

## BOARD OF SUPERVISORS COUNTY OF STAFFORD STAFFORD, VIRGINIA

#### **ORDINANCE**

At a regular meeting of the Stafford County Board of Supervisors (the Board) held in the Board Chambers, George L. Gordon, Jr., Government Center, Stafford, Virginia, on the 20<sup>th</sup> day of June, 2017:

\_\_\_\_\_

#### **MEMBERS**:

<u>VOTE</u>:

Paul V. Milde, III, Chairman Meg Bohmke, Vice Chairman Jack R. Cavalier Wendy E. Maurer Laura A. Sellers Gary F. Snellings Robert "Bob" Thomas, Jr.

On motion of , seconded by , which carried by a vote of , the following was adopted:

AN ORDINANCE TO AMEND AND REORDAIN THE STAFFORD COUNTY ZONING ORDINANCE BY AMENDING THE ZONING DISTRICT MAP TO RECLASSIFY FROM THE A-1, AGRICULTURAL ZONING DISTRICT TO THE R-1, SUBURBAN RESIDENTIAL ZONING DISTRICT, TAX MAP PARCEL NO. 29-4, LOCATED WITHIN THE GARRISONVILLE AND ROCK HILL ELECTION DISTRICTS

WHEREAS, Winding Creek Owner, LLC (Applicant), submitted application RC16151333, requesting a reclassification from the A-1, Agricultural Zoning District to the R-1, Suburban Residential Zoning, on Tax Map Parcel No. 29-4, located in the Garrisonville and Rock Hill Election Districts; and

WHEREAS, the Board carefully considered the recommendations of the Planning Commission and staff, and the public testimony, if any, received at the public hearing; and

WHEREAS, the Board finds that the requested zoning amendment is compatible with the surrounding land uses and meets the criteria for a rezoning in Stafford County Code Sec. 28-206; and

WHEREAS, the Board finds that public necessity, convenience, general welfare, and good zoning practice require adoption of this Ordinance to reclassify the subject property;

O17-02 Page 2

NOW, THEREFORE, BE IT ORDAINED by the Stafford County Board of Supervisors on this the 20<sup>th</sup> day of June, 2017, that the Stafford County Zoning Ordinance be and it hereby is amended and reordained by amending the Zoning District Map to reclassify from the A-1, Agricultural Zoning District to the R-1, Suburban Residential Zoning District, Tax Map Parcel No. 29-4, in the location shown on the plat entitled "Boundary Survey of the Lands of John J. Musselman, Trustee of the Earl F. Musselman Trust, Created U/A/D November 28, 2001" prepared by Bowman Consulting, dated April 1, 2014, sealed June 8, 2016, with proffers entitled "Proffer Statement," dated May 24, 2017.

TCF:JAH:kb

Attachment 3 Page 1 of 2

<u>R17-09</u>

#### PROPOSED

## BOARD OF SUPERVISORS COUNTY OF STAFFORD STAFFORD, VIRGINIA

#### **RESOLUTION**

At a regular meeting of the Stafford County Board of Supervisors (the Board) held in the Board Chambers, George L. Gordon, Jr., Government Center, Stafford, Virginia, on the  $20^{th}$  day of June, 2017:

\_\_\_\_\_

#### **MEMBERS**:

<u>VOTE</u>:

Paul V. Milde, III, Chairman Meg Bohmke, Vice Chairman Jack R. Cavalier Wendy E. Maurer Laura A. Sellers Gary F. Snellings Robert "Bob" Thomas, Jr.

On motion of , seconded by , which carried by a vote of , the following was adopted:

A RESOLUTION TO DENY THE REQUEST TO AMEND AND REORDAIN THE STAFFORD COUNTY ZONING ORDINANCE BY AMENDING THE ZONING DISTRICT MAP TO RECLASSIFY FROM THE A-1, AGRICULTURAL ZONING DISTRICT TO THE R-1, SUBURBAN RESIDENTIAL ZONING DISTRICT, TAX MAP PARCEL NO. 29-4, LOCATED WITHIN THE GARRISONVILLE AND ROCK HILL ELECTION DISTRICTS

WHEREAS, Winding Creek Owner, LLC (Applicant), submitted application RC16151333, requesting a reclassification from the A-1, Agricultural Zoning District to the R-1, Suburban Residential Zoning, on aTax Map Parcel No. 29-4, located in the Garrisonville and Rock Hill Election Districts; and

WHEREAS, the Board carefully considered the recommendations of the Planning Commission and staff, and the public testimony, if any, received at the public hearing; and

WHEREAS, the Board finds that the requested zoning amendment is incompatible with the surrounding land uses and does not meet the criteria for a rezoning in Stafford County Code Sec. 28-206;

R17-09

NOW, THEREFORE, BE IT RESOLVED by the Stafford County Board of Supervisors on this the 20<sup>th</sup> day of June, 2017, that application RC16151333 be and it hereby is denied. TCF:JAH:kb

Attachment 4 O17-02 R17-09

## LAND USE ACTION REQUEST

## **BOARD OF SUPERVISORS**

Date: June 20, 2017

[ ] New	[ ] Rev	rised	[X] Unfir	iished
<u>REQUEST</u> :	Reclassification from A-1, Agr consisting of 61.23 acres.	icultural to R-1, Su	burban Resi	dential on Tax Map Parcel No. 29-4,
Conforms with	n the Comprehensive Plan?	[X] Yes [] N	lo	[ ] N/A
CONDITIONS:	See proposed Ordinance 017-0	)2		
<u>APPLICANT</u> :				
Name:	Frank Lackman Winding Creek Owner, LLC			
Address:	1256 Welton Court Centreville, VA 20120			
Agent:	Charles W. Payne, Jr. Hirschler Fleischer			
<u>TAX STATUS:</u>	Paid through December 5, 201	7		
PLANNING CO	OMMISSION RECOMMENDATIO	<u>DN</u> : App	rove [X]	Deny [ ]
At its meeting English abstair	g on October 26, 2016, the Plann ned) to recommend approval of	ning Commission vo Application RC1615	oted 4-2 (Ms 51333.	. Vanuch and Mr. Coen voted no, Mr.
TIMING:				
Application Date June 17, 2016 (submitted); June 30, 2016 (completed)				

Advertisement Date/s	January 10, 2017 and January 17, 2017			
Plan. Comm. Action Date	<u>October 28, 2016</u>	(Required)	January 6, 2017	

Proposed Board Action Date June 20, 2017 (Required) June 29, 2017

## Winding Creek Rezoning Summary of differences between 2014 and 2016 applications

	2014	2016
Tax Parcel Nos.	29-4 and 29-5C	29-4
Acreage	61.23	63.13
Density	1.54 units/acre	1.58 units/acre
Allowable # of units	142	137
<b>Open Space Proposed</b>	35.77 acres (56.6%)	33.29 acres (54.4%)
Proposed Layout	Included a street connection to Fireberry Boulevard	Removes street connection to Fireberry Boulevard, and street now ends in a cul-de-sac
	Future interparcel street connection to Parcel 29-5A	Future interparcel street connection to Wetrock Lane
Proposed Proffers	Included language regarding street connection to Fireberry Boulevard	Removes language regarding street connection to Fireberry Boulevard
	Required building elevations not be repeated within 3 units of each other	Removes language regarding repetition of architectural elevations
	Required architectural shingles on dwellings	Removes language regarding architectural shingles
	Required review for consistency with Neighborhood Development Standards (NDS)	Removes language regarding consistency with NDS (addressed in proffered architectural elevations instead)
		Removes duplicative proffers regarding open space and cultural resources



2016 Generalized Development Plan



2014 Generalized Development Plan

## **STAFFORD COUNTY, VIRGINIA**

**PROFFER STATEMENT** 

Applicant:	Winding Creek Owner LLC (the "Applicant")
Property Owner:	John J Musselman, Trustee of the Earl F. Musselman Trust (the "Owner")
Property:	Tax Parcel 29-4 (the "Property")
Rezoning Request:	From A-1 to R-1
Project Name:	Winding Creek (the "Project")
Date:	May 24, 2017
County File No.	RC 16151330 CUP 16151334

## 1. General Requirements.

(a) The following proffers are being made pursuant to Sections 15.2-2298 and 15.2-2303, et al. of the Code of Virginia (1950), as amended, and Section 28-161, et seq. of the Stafford County Zoning Ordinance. The proffers provided herein are the only proffered conditions offered in this rezoning application, and any prior proffers to which the Property (as generally defined above and shown on the GDP) may be subject to or previously offered with the Applicant's application or otherwise previously proffered are hereby superseded by these proffers, and further said prior proffers are hereby void and of no further force and effect. In addition and notwithstanding the foregoing, the proffers provided hereunder are conditioned upon and become effective only in the event the Applicant's rezoning application No. RC 16151330 and associated conditional use permit application 16151334 are approved (including through applicable appeal periods) by the Stafford County Board of Supervisors (the "County").

(b) Subject to the terms hereunder, the Property will be developed in accordance with that certain generalized development plan entitled "Winding Creek Generalized Development Plan" dated May 2014, as last revised August 29, 2016, with addition of revised sheet 11 dated April 27, 2017, prepared by Bowman Consulting, attached hereto as <u>Exhibit A</u> (the "GDP"), which plan includes a clustered development with a maximum of ninety-seven (97) single family detached units ("Units" or Unit"). The aforesaid number of units are subject to the approval of the Applicant's companion conditional use permit application #16151334.

(c) For purposes of the final site plan, which will supersede the GDP, proposed parcel lines, parcel sizes, building envelopes and footprints, access points, building sizes, building locations, public road locations, private driveway, road and travel way locations, interparcel

connectors, RPAs and wetland areas, utility locations, storm water management facilities, and dimensions of undeveloped areas shown on the GDP may be relocated and/or amended from time-to-time by the Applicant to address final development, engineering, and design requirements and/or compliance with federal or state agency regulations including, but not limited to, VDOT, DEQ, Army Corps of Engineers, etc., and compliance with the requirements of the County's applicable development regulations and design standards manual.

2. <u>Architecture & Materials</u>. For purposes of the proposed development, the architectural design of the Units shall be in general accordance with the renderings attached hereto as <u>Exhibit</u> <u>B</u> (the "Renderings"). The Renderings are illustrative only and do not depict the final elevations for this Project. In this regard, the Renderings depict (i) a commitment to a general type, character, and quality of architectural design, details and materials; and (ii) the general types of architectural and decorative elements and features. In addition, the Units will specifically include the following:

(a) The front elevation of 75% of the Units will consist of a minimum of 60% brick, natural stone, or cultured stone (excluding doors, windows and garages). All homes will include beaded vinyl and Applicant will offer fiber cement siding as an option to buyers.

(b) The side elevation facing the street of a Unit on a corner lot will have at least two operable windows.

(c) All Units will have brick or stone to grade on any side facing a street (including corner lots).

(d) All Units will include pitched roofs symmetrically sloped no less than 5:12, except that porches and attached sheds may be no less than 2:12 and all Units will avoid continuous roof planes on the front side of dwellings by incorporating gables as depicted on the Renderings.

**3.** <u>Entrance Features</u>. The Applicant agrees to construct an entrance monument out of brick or stone utilized in the development. The client has attached a rendering which reflects the general architectural features and materials of the entrance sign.

4. <u>**Transportation**</u>. The Applicant, subject to necessary County and VDOT approvals for the development of the Project, agrees to provide the following in-kind transportation proffers, all as generally shown and noted on the GDP:

(a) The Applicant agrees to dedicate 0.84 acres of right of way along Winding Creek Road to widen the right of way to a width of sixty feet (60'), all in the areas generally shown and noted on the GDP.

(b) The Applicant agrees to dedicate 0.78 acres of right of way for the relocation of Embrey Mill Road, all in the areas generally shown and noted on the GDP.

(c) Subject to the terms and conditions provided herein, the Applicant agrees to provide the following in kind offsite transportation proffers:

(1) the construction of right turn tapers and acceleration lanes off of Winding Creek Road into the southernmost entrance of the Project, all as depicted on the GDP; and

(2) the construction of certain road improvements along Winding Creek Road extending from the end of the northernmost entrance of the Project to the intersection of Winding Creek Road and Flatford and Walpole Streets (approximately 1250 feet), all as generally shown and noted on the GDP (collectively the "Winding Creek Road Improvements"). All Winding Creek Road Improvements shall be designed and constructed in general accordance with the attached GDP and will follow the Virginia Department of Transportation ("VDOT") RRR guidelines (with waivers potentially required for shoulder widths and pavement radii), and further subject to final County and VDOT review and approval of the construction plans and completed under VDOT permit. With the exception of any temporary construction, private or public storm water easements or other similar easements, the Winding Creek Improvements will be constructed and located within dedicated right of way area, including without limitation any improvements that include retaining walls. The Winding Creek Road Improvements are estimated as approximately One Million Dollars (\$1,000,000) in total costs.

In the event the Applicant is unable to obtain easement approvals and/or right of way area(s) dedication from any third party property owner that are necessary for the construction of the Winding Creek Road Improvements, the Applicant shall petition the County to utilize its condemnation authority to obtain necessary public easements and/or right of way areas to construct said improvements. In this event, the Applicant shall provide the following:

- Written request to the County to utilize its condemnation authority to obtain the subject easements and right of way areas;
- The names of the record owners, the property addresses, tax map parcel numbers for each landowner from whom such right-of-way and/or easements are sought.
- Plats, plans and profiles showing the necessary right-of-way and/or easements to be acquired and showing the details of the proposed transportation improvements to be located on each such property.
- An independent appraisal of the value of the right-of-way and easements to be acquired, and any and all damages to the residue of the involved property, said appraisal to be performed by an appraiser licensed in Virginia and approved by the County.

- A 60-year title search of each involved property.
- Documentation demonstrating to the County's satisfaction Applicant's good faith, best efforts to acquire the right-of-way and/or easements, at a cost of at least the appraised value of the involved property interests.
- A letter of credit acceptable to the County, cash or equivalent (from a financial institution acceptable to the County) in an amount equal to the appraised value of the property to be acquired, and all damages to the residue, together with an amount representing the County's estimate of its cost of condemnation proceedings, in a form permitting the County to draw upon the same as necessary to effectuate the purposes hereof.
- An Agreement signed by Applicant's representative and approved by the County Attorney whereby Applicant agrees to pay all costs of the condemnation, including expert witness fees, court costs, exhibit costs, court reporter fees, attorneys' fees for the Office of the County Attorney or attorney retained by the County, and all other costs associated with the litigation, including appeals. The Agreement shall specifically provide that in the event the property owner is awarded in the condemnation suit more than the appraised value estimated by Applicant's appraiser, Applicant shall pay to the County the amount of the award in excess of the amount represented by the letter of credit or cash deposit within fifteen (15) days of the award.

In the event that the County does not secure access to the public easements or right-of-way areas necessary for the Winding Creek Road Improvements within six (6) months of the Applicant providing all of the preceding information, the Applicant shall be relieved from having to construct the Winding Creek Road Improvements, and thereafter agrees to pay One Million Dollars (\$1,000,000) in total transportation cash proffers, which One Million Dollars (\$1,000,000) shall be payable per residential unit of \$10,309.27 prior to the issuance of a certificate of occupancy for each unit.

In the event the Applicant is able to obtain easements and/or right of way areas necessary to complete the Winding Creek Road Improvements, whether by third party agreements or County condemnation, the Applicant agrees to complete the Winding Creek Road Improvements prior to the County's issuance of the 21<sup>st</sup> certificate of occupancy permit for the Project.

(d) The Applicant agrees to construct a sidewalk to Winding Creek Road and a painted crosswalk connecting the east and west sides of Winding Creek Road, all in the areas generally shown and noted on the GDP.

(e) The transportation improvements (not otherwise required for the development) and/or dedications of right of way, as provided above under this Section 4, are an in kind transportation proffers for purposes of this rezoning. The dedications described under Sections 4 (a) and (b) shall be provided as part of the first (final & approved) subdivision plan for the Property.

5. <u>Preservation of Open Space</u>. The 10.326 acres of land shown and labeled as "Open Space Parcel E" on the GDP shall be preserved as open space and not developed or disturbed, except for park purposes in the event the County accepts the dedication of said parcel. In this regard, Open Space Parcel E will be dedicated to the County upon the approval of the first section of the final subdivision plan of the Property. In the event the County does not desire to accept the dedication, Open Space Parcel E will be placed in a conservation easement. Notwithstanding the foregoing, in the event the Applicant is unable to obtain the acceptance of a third party holder for the conservation easement, then Open Space Parcel E will be conveyed to the Project's Homeowners's association (as described below under Section 7) and encumbered by restrictive covenants that will prohibit the development of said parcel. The fair market value of the dedication and preservation of open space is approximately <u>\$913,875.27</u>.

6. <u>Cash Contributions</u>. For purposes of this rezoning and in addition to other proffers described hereunder, the Applicant agrees to pay \$1,439,557.00 or \$14,840.80 per unit in aggregate cash proffers, all as described in more detail below. These cash proffers are also subject to annual increases to be calculated on a yearly basis commencing two (2) years after the date of final County approval of this proffer statement. Such increases shall be calculated by multiplication of the Marshall-Swift Index and not the Consumer Price Index of the Department of Labor Statistics for the current year by the original per unit cash proffer amount. All cash proffers shall be paid by the Applicant upon the issuance of a final certificate of occupancy by the County for each Unit (e.g. 97 single family detached units).

These voluntary cash proffers, paid by the Applicant to the County, shall be allocated based on the following:

- (a) **Schools**: \$1,266,923.00 (\$13,061.06 per Unit). \*
- (b) **<u>Parks & Recreation</u>**: \$0.00
- (c) <u>Transportation</u>:\$0.00
- (d) Libraries: \$57,519.00 (\$593.00 per Unit)
- (e) Fire & Rescue: \$74,151.00 (\$764.44 per Unit)
- (f) General Government: \$40,964.00 (\$422.30 per Unit)

\* Notwithstanding anything to the contrary under this proffer statement, <u>\$650,000.00</u> of the total of the abovementioned "Schools" proffer shall be set-aside for North Stafford High School

capital facility improvements so long as such improvements are approved and funded within seven (7) years of the approval of this proffer statement. If the aforesaid does not occur, these funds may be utilized for general Schools capital facility purposes.

7. <u>Covenants</u>. The Applicant, prior to developing the Property, shall encumber the Property with a declaration of conditions, covenants, restrictions, and easements for the purpose of (a) protecting the value and desirability of the property; (b) facilitating the planning and development of the project in a unified and consistent manner; (c) preserving the Open Space Parcel E; and (d) providing for the installation, maintenance, and repair for all landscaping, onsite amenities, open space, other common areas and applicable offsite improvements described above under Section 4 (c). The Applicant will also create a property or homeowner's association as a non-stock corporation under the laws of Virginia (the "HOA") that will provide and ensure oversight and structure for services provided, quality standards, intercampus relationships, and common area maintenance.

In addition, for all future property owners abutting the VEPCO easement shown on the GDP, the Applicant will provide each buyer a disclosure notice identifying the fact that overhead power lines may be constructed within the VEPCO easement in the future.

8. <u>Fire Sprinklers in Residential Units</u>. The Applicant agrees to offer as an option to purchasers of any of the Units, but not as a requirement, fire sprinkler systems within said Units. In no event shall these fire sprinkler systems be a requirement for purposes of construction and/or permitting, but rather only an option payable by purchasers of the Units.

**9. Environmental Impact Mitigation**. The Applicant proffers the following for any lot depicted on the GDP as being located within a Critical Resource Protection Area ("CRPA"):

- (a) Subsequent to the issuance of a building permit and prior to the issuance of an occupancy permit for the construction of a single-family dwelling on any residential lot or parcel with lot lines within the CRPA, a sign shall be installed by the developer identifying the landward limits of the CRPA and notification will be provided to the County Zoning Administrator after completion. Such signs shall conform to the Critical Resource Protection Area Signage Policy and shall be installed at the expense of the developer in accordance with the Critical Resource Protection Area Signage Policy.
- (b) No certificate of occupancy shall be issued for a single-family dwelling on any residential lot or parcel with lot lines within the CRPA until the installation of any required plant materials is completed and documentation of such is submitted to the County Zoning Administrator.
- (c) The deeds for such lots shall include deed restrictions providing the following:
  - i. The property owner shall be responsible for the maintenance and replacement of all vegetation as may be required by the provisions of the County's Chesapeake Bay Preservation Area Overlay District.

- ii. Plant material within the CRPA shall be tended and maintained in healthy growing condition and free from refuse and debris at all times.
- iii. Diseased plant materials shall be replaced during the next planting season, as may be required by the provisions of the County's Chesapeake Bay Preservation Area Overlay District.
- iv. No certificate of occupancy shall be issued until the installation of any plant materials required by the County's Chesapeake Bay Preservation Area Overlay District is completed and documentation of such is submitted to the County Zoning Administrator.

**10.** <u>**Historic Preservation**</u>. The Applicant agrees to perform a Phase 1 Archeology Study on the Property if historical artifacts are discovered during development of the Property, and to perform a Phase 2 Archeology Study on the Property if required by the said Phase 1 Archeology Study.

11. <u>Belmont Museum</u>. The Applicant agrees to voluntarily donate and gift to the Belmont Museum, upon the approval of the first residential occupancy permit within the Project, the sum of \$30,000.00 for purposes of assisting the museum with any facility improvements or for other general museum purposes.

**12.** <u>Purchase of Development Rights Program</u>. The Applicant will voluntarily donate and gift the aggregate sum of <u>\$500,000.00</u> directly to the Stafford County Purchase of Development Rights Program ("PDR Program"). This sum shall be paid to the Board of Supervisors for the PDR Program pursuant to the following payment schedule: (a) \$50,000 upon the issuance of a certificate of occupancy permit for the 10<sup>th</sup> residential unit; (b) \$50,000 upon the issuance of a certificate of occupancy permit for the 20<sup>th</sup> residential unit; (c) \$50,000 upon the issuance of a certificate of occupancy permit for the 30<sup>th</sup> residential unit; (d) \$50,000 upon the issuance of a certificate of occupancy permit for the 40<sup>th</sup> residential unit; and (e) the remainder amount of \$300,000 upon the issuance of the certificate of occupancy for the 50<sup>th</sup> residential unit (collectively the "PDR Gift Payment"). In the event the Applicant fails to make the PDR Gift Payment, the said payment shall convert to a cash proffer obligation (the "Cash Proffer Conversion") in an amount of \$600,000 payable to the County upon the issuance of the 51<sup>st</sup> certificate of occupancy permit. The Cash Proffer Conversion, pursuant to the sole discretion of the Board of Supervisors, may be applied to public schools, transportation, parks and recreation, fire and rescue and/or other capital facility programs.

13. <u>Miscellaneous.</u> The Applicant agrees to provide the following proffers:

- (a) Proposed development shall be limited to 97 single-family detached dwelling units.
- (b) Open Space Parcels "A" (outside the VEPCO easement) and "D" shall include a 20-foot street buffer, consisting of a double row of evergreen trees, between residential lots and along the Winding Creek Road right-of-way, as shown on the GDP.

- (c) Open Space Parcel "C" shall include a variable width street buffer, consisting of a double row of evergreen trees, between residential lots and along the Winding Creek Road right-of-way, to the maximum extent allowed by the lot configuration generally as shown on the GDP.
- (d) Each lot shall contain foundation landscaping and at least one (1) tree shall be provided in the rear yard, with a 1" caliper or 6-8' tall at planting.
- (e) The Applicant will install and construct a tot lot in the general location as shown on the GDP and a picnic/pavilion area, the availability and location of said picnic/pavilion area to be determined at time of final engineering.
- (f) The Applicant agrees to provide a landscape buffer, consisting of a double row of evergreen trees, between Lot 43 and 44 and the adjacent property owner, as shown on sheet 9 of the GDP.

[AUTHORIZED SIGNATURES TO FOLLOW]

Attachment 6 Page 9 of 12

## **APPLICANT ACKNOWLEDGMENT & CONSENT**

Winding Creek Owner LLC, a Virginia limited liability company By: Name: Title: Nuoy STATE/COMMONWEALTH OF CITY/COUNTY OF to wit: The foregoing instrument was acknowledged before me this the day of April, 2017, by 2017, by company. Motary Public My Commission expires: ALAN SCHACTER Notary Public, State of New York No. 02SC4995531 Qualified in Nassau County Commission Expires April 27, 2018 Notary Registration number:

9

#### Attachment 6 Page 10 of 12

## **OWNERS ACKNOWLEDGMENT & CONSENT**

The Earl F. Musselman Trust created November 28, 2001 Tausta BY: John J. Musselman, Trustee

## COMMONWEALTH OF VIRGINIA, CITY OF FREDERICKSBURG, to wit:

The foregoing instrument was acknowledged before me this  $\underline{\mathfrak{I}}^{\prime\prime}$  day of  $\underline{\mathcal{M}}_{aq}$ 2017, by John J. Musselman, Trustee for The Earl F. Musselman Trust created November 28, 2001.

Notary Public

My Commission expires: <u>10/31/17</u> Notary Registration number: <u>359073</u>



## EXHIBIT A

## Generalized Development Plan

See attached "Winding Creek Generalized Development Plan" dated May 2014, as last revised August 29, 2016, with addition of revised sheet 11 dated April 27, 2017, and prepared by Bowman Consulting.

Attachment 6 Page 12 of 12

## EXHIBIT B

Renderings

8773711-3 039798.00001
## STAFFORD COUNTY, VIRGINIA

## PROFFER STATEMENT

Applicant:	Winding Creek Owner, LLC (the "Applicant")
Property Owner:	John J Musselman, Trustee of the Earl F. Musselman Trust (the "Owner")
Property:	Tax Parcel 29-4 (the "Property")
Rezoning Request:	From A-1 to R-1
Project Name:	Winding Creek (the "Project")
Date:	Originally dated June 15, 2016, and updated as of January 25, May 24, 2017
County File No.	RC 16151330 CUP 16151334

### 1. <u>General Requirements</u>.

(a) The following proffers are being made pursuant to Sections 15.2-2298 and 15.2-2303, et al. of the Code of Virginia (1950), as amended, and Section 28-161, et seq. of the Stafford County Zoning Ordinance. The proffers provided herein are the only proffered conditions offered in this rezoning application, and any prior proffers to which the Property (as generally defined above and shown on the GDP) may be subject to or previously offered with the Applicant's application or otherwise previously proffered are hereby superseded by these proffers, and further said prior proffers are hereby void and of no further force and effect. In addition and notwithstanding the foregoing, the proffers provided hereunder are conditioned upon and become effective only in the event the Applicant's rezoning application No. RC 16151330 and associated conditional use permit application 16151334 are approved (including through applicable appeal periods) by the Stafford County Board of Supervisors (the "County").

(b) Subject to the terms hereunder, the Property will be developed in accordance with that certain generalized development plan entitled "Winding Creek Generalized Development Plan" dated May 2014, as last revised August 29, 2016, with addition of <u>revised</u> sheet 11A dated January 23, April 27, 2017, prepared by Bowman Consulting, attached hereto as <u>Exhibit A</u> (the "GDP"), which plan includes a clustered development with a maximum of ninety-seven (97) single family detached units ("Units" or Unit"). The aforesaid number of units are subject to the approval of the Applicant's companion conditional use permit application #16151334.

(c) For purposes of the final site plan, which will supersede the GDP, proposed parcel lines, parcel sizes, building envelopes and footprints, access points, building sizes, building

locations, public road locations, private driveway, road and travel way locations, interparcel connectors, RPAs and wetland areas, utility locations, storm water management facilities, and dimensions of undeveloped areas shown on the GDP may be relocated and/or amended from time-to-time by the Applicant to address final development, engineering, and design requirements and/or compliance with federal or state agency regulations including, but not limited to, VDOT, DEQ, Army Corps of Engineers, etc., and compliance with the requirements of the County's applicable development regulations and design standards manual.

2. <u>Architecture & Materials</u>. For purposes of the proposed development, the architectural design of the Units shall be in general accordance with the renderings attached hereto as <u>Exhibit B</u> (the "Renderings"). The Renderings are illustrative only and do not depict the final elevations for this Project. In this regard, the Renderings depict (i) a commitment to a general type, character, and quality of architectural design, details and materials; and (ii) the general types of architectural and decorative elements and features. In addition, the Units will specifically include the following:

(a) The front elevation of 75% of the Units will consist of a minimum of 60% brick, natural stone, or cultured stone (excluding doors, windows and garages). All homes will include beaded vinyl and Applicant will offer fiber cement siding as an option to buyers.

(b) The side elevation facing the street of a Unit on a corner lot will have at least two operable windows.

(c) All Units will have brick or stone to grade on any side facing a street (including corner lots).

(d) All Units will include pitched roofs symmetrically sloped no less than 5:12, except that porches and attached sheds may be no less than 2:12 and all Units will avoid continuous roof planes on the front side of dwellings by incorporating gables as depicted on the Renderings.

**3.** <u>Entrance Features</u>. The Applicant agrees to construct an entrance monument out of brick or stone utilized in the development. The client has attached a rendering which reflects the general architectural features and materials of the entrance sign.

**4.** <u>**Transportation**</u>. The Applicant, subject to necessary County and VDOT approvals for the development of the Project, agrees to provide the following in-kind transportation proffers, all as generally shown and noted on the GDP:

(a) The Applicant agrees to dedicate 0.84 acres of right of way along Winding Creek Road to widen the right of way to a width of sixty feet (60'), all in the areas generally shown and noted on the GDP.

(b) The Applicant agrees to dedicate 0.78 acres of right of way for the relocation of Embrey Mill Road, all in the areas generally shown and noted on the GDP.

(c) <u>TheSubject to the terms and conditions provided herein, the</u> Applicant agrees to provide the following in kind offsite transportation proffers:

(1) the construction of a right turn lane at the intersection of Eustace Road and Northampton Boulevardright turn tapers and acceleration lanes off of Winding Creek Road into the southernmost entrance of the Project, all as depicted on the GDP (with an estimated in-kind proffer value of \$150,662.20). The Applicant will undertake all reasonable, and good faith efforts in attempts to obtain the necessary right of way area for the aforesaid improvements; –; and

(2) the construction of a right turn taper and acceleration lane off of Winding Creek Road and into the main entrance of the Project, all as depicted on the GDP (with an estimated in kind proffer value of \$186,974.00); and

(3) clearing, grading and sight line improvements along Winding Creek Road at the sharp curve located roughly 530 feet north of the northern limit of the Project, all as depicted on the GDP<sup>4</sup>. For purposes of this Section 4 (c) (3) proffer, the Applicant has obtained or will soon obtain necessary third party easements to construct the improvements, and pursuant to said easements agrees to be solely responsible for the costs to construct, maintain and repair said improvements; except the Applicant shall not be required, after the final construction of the improvements, to continue to maintain or repair said improvements if the improvements are dedicated to the County and/or VDOT and accepted by the same. Notwithstanding anything to the contrary under this proffer statement, in the event the Applicant has not dedicated the improvements described under this Section 4 (c) (3), and thus remains obligated to repair and maintain the said improvements, but fails to do so, then up to \$100,000 of the cash transportation proffers described under Section 6 (c) shall be utilized to maintain and/or repair said improvements. The improvements described under this Section 4 (c) (3) shall be completed prior to the County's issuance of the Applicant 21<sup>st</sup> certificate of occupancy. (2) the construction of certain road improvements along Winding Creek Road extending from the end of the northernmost entrance of the Project to the intersection of Winding Creek Road and Flatford and Walpole Streets (approximately 1250 feet), all as generally shown and noted on the GDP (collectively the "Winding Creek Road Improvements"). All Winding Creek Road Improvements shall be designed and constructed in general accordance with the attached GDP and will follow the Virginia Department of Transportation ("VDOT") RRR guidelines (with waivers potentially required for shoulder widths and pavement radii), and further subject to final County and VDOT review and approval of the construction plans and completed under VDOT permit. With the exception of any temporary construction, private or public storm water easements or other similar easements, the Winding Creek Improvements will be constructed and located within dedicated right of way area, including without limitation any improvements that include retaining walls. The Winding Creek Road Improvements are estimated as approximately One Million Dollars (\$1,000,000) in total costs.

In the event the Applicant is unable to obtain easement approvals and/or right of way area(s) dedication from any third party property owner that are necessary for the construction of the Winding Creek Road Improvements, the Applicant shall petition the County to utilize its condemnation authority to obtain necessary public easements and/or right of way areas to construct said improvements. In this event, the Applicant shall provide the following:

- Written request to the County to utilize its condemnation authority to obtain the subject easements and right of way areas;
- <u>The names of the record owners, the property addresses, tax map parcel</u> <u>numbers for each landowner from whom such right-of-way and/or</u> <u>easements are sought.</u>
- Plats, plans and profiles showing the necessary right-of-way and/or easements to be acquired and showing the details of the proposed transportation improvements to be located on each such property.
- An independent appraisal of the value of the right-of-way and easements to be acquired, and any and all damages to the residue of the involved property, said appraisal to be performed by an appraiser licensed in Virginia and approved by the County.
- <u>A 60-year title search of each involved property.</u>
- <u>Documentation demonstrating to the County's satisfaction Applicant's</u> good faith, best efforts to acquire the right-of-way and/or easements, at a cost of at least the appraised value of the involved property interests.
- A letter of credit acceptable to the County, cash or equivalent (from a financial institution acceptable to the County) in an amount equal to the appraised value of the property to be acquired, and all damages to the residue, together with an amount representing the County's estimate of its cost of condemnation proceedings, in a form permitting the County to draw upon the same as necessary to effectuate the purposes hereof.
- An Agreement signed by Applicant's representative and approved by the County Attorney whereby Applicant agrees to pay all costs of the condemnation, including expert witness fees, court costs, exhibit costs, court reporter fees, attorneys' fees for the Office of the County Attorney or attorney retained by the County, and all other costs associated with the litigation, including appeals. The Agreement shall specifically provide that in the event the property owner is awarded in the condemnation suit more than the appraised value estimated by Applicant's appraiser, Applicant shall pay to the County the amount of the award in excess of the amount represented by the letter of credit or cash deposit within fifteen (15) days of the award.

In the event that the County does not secure access to the public easements or right-of-way areas necessary for the Winding Creek Road Improvements within six (6) months of the Applicant providing all of the preceding information, the Applicant shall be relieved from having to construct the Winding Creek Road Improvements, and thereafter agrees to pay One Million Dollars (\$1,000,000) in total transportation cash proffers, which One Million Dollars (\$1,000,000) shall be payable per residential unit of \$10,309.27 prior to the issuance of a certificate of occupancy for each unit.

In the event the Applicant is able to obtain easements and/or right of way areas necessary to complete the Winding Creek Road Improvements, whether by third party agreements or County condemnation, the Applicant agrees to complete the Winding Creek Road Improvements prior to the County's issuance of the 21<sup>st</sup> certificate of occupancy permit for the Project.

The total estimated value to design and construct the improvements described under this Section 4 (c) is <u>\$750,098.90</u>.

(d) The Applicant agrees to construct a sidewalk to Winding Creek Road and a painted crosswalk connecting the east and west sides of Winding Creek Road, all in the areas generally shown and noted on the GDP.

(e) The transportation improvements (not otherwise required for the development) and/or dedications of right of way, as provided above under this Section 4, are an in kind transportation proffers for purposes of this rezoning. The dedications described under Sections 4 (a) and (b) shall be provided as part of the first (final & approved) subdivision plan for the Property.

5. <u>Preservation of Open Space</u>. The 10.326 acres of land shown and labeled as "Open Space Parcel E" on the GDP shall be preserved as open space and not developed or disturbed, except for park purposes in the event the County accepts the dedication of said parcel. In this regard, Open Space Parcel E will be dedicated to the County upon the approval of the first section of the final subdivision plan of the Property. In the event the County does not desire to accept the dedication, Open Space Parcel E will be placed in a conservation easement. Notwithstanding the foregoing, in the event the Applicant is unable to obtain the acceptance of a third party holder for the conservation easement, then Open Space Parcel E will be conveyed to the Project's Homeowners's association (as described below under Section 7) and encumbered by restrictive covenants that will prohibit the development of said parcel. The fair market value of the dedication and preservation of open space is approximately <u>\$913,875.27</u>.

6. <u>Cash Contribution Contributions</u>. For purposes of this rezoning and in addition to other proffers described hereunder, the Applicant agrees to pay  $\frac{2,159,459.60}{1,439,557.00 \text{ or}}$ <u>\$14,840.80 per unit</u> in aggregate cash proffers, all as described in more detail below. These cash proffers are also subject to annual increases to be calculated on a yearly basis commencing two (2) years after the date of final County approval of this proffer statement. Such increases shall be calculated by multiplication of the Marshall-Swift Index and not the Consumer Price Index of the Department of Labor Statistics for the current year by the original per unit cash proffer amount. All cash proffers shall be paid by the Applicant upon the issuance of a final certificate of occupancy by the County for each Unit (e.g. 97 single family detached units).

These voluntary cash proffers, paid by the Applicant to the County, shall be allocated based on the following:

- (a) <u>Schools</u>: \$1,616,923.00 (\$16,669.31<u>1,266,923.00 (\$13,061.06</u> per Unit). \*
- (b) <u>Parks & Recreation</u>: \$150,000.00 (\$1,546.39 per Unit)0.00
- (c) <u>Transportation</u>: <u>\$219,901.10 cash (\$2,267.02 per Unit) \*\* </u><u>\$0.00</u>
- (d) <u>Libraries</u>: \$57,519.00 (\$593.00 per Unit)
- (e) <u>Fire & Rescue</u>: \$74,151.00 (\$764.44 per Unit)
- (f) <u>General Government</u>: \$40,964.00 (\$422.31422.30 per Unit)

## Total Cash Proffers are \$2,159,459.60

## Total In-Kind Proffers: \$1,733,006.01

### **Total Cash and In-kind Proffers are** \$3,892,525.60 (\$40,129.13 per Unit)

\* Notwithstanding anything to the contrary under this proffer statement,  $\frac{550,000.00}{650,000.00}$  of the total of the abovementioned "Schools" proffer shall be set-aside for the North Stafford High School Locker Bay Renovation if such renovation is capital facility improvements so long as such improvements are approved and funded within fiveseven (57) years of the approval of this proffer statement. If such renovation the aforesaid does not occur, these funds may be utilized for general Schools capital facility purposes.

### **\*\*** Section 6 (c) is subject to the conditions provided under Section 4(c) (3)

7. <u>Covenants</u>. The Applicant, prior to developing the Property, shall encumber the Property with a declaration of conditions, covenants, restrictions, and easements for the purpose of (a) protecting the value and desirability of the property; (b) facilitating the planning and development of the project in a unified and consistent manner; (c) preserving the Open Space Parcel E; and (d) providing for the installation, maintenance, and repair for all landscaping, on-site amenities, open space, other common areas and applicable offsite improvements <u>described above under Section 4</u> (c). The Applicant will also create a property or homeowner's association as a non-stock corporation under the laws of Virginia (the "HOA") that will provide and ensure oversight and structure for services provided, quality standards, intercampus relationships, and common area

In addition, for all future property owners abutting the VEPCO easement shown on the GDP, the Applicant will provide each buyer a disclosure notice identifying the fact that overhead power lines may be constructed within the VEPCO easement in the future.

Notwithstanding anything to the contrary under this proffer statement, the Applicant shall include within the covenants expressed herein, an obligation of the future HOA to collect adequate assessments and/or reserves to continue the maintenance of the offsite transportation improvements provided above under Section 4 (c) (3) if the Applicant and/or HOA remain obligated to maintain said improvements as provided in this proffer statement.

8. <u>Fire Sprinklers in Residential Units</u>. The Applicant agrees to offer as an option to purchasers of any of the Units, but not as a requirement, fire sprinkler systems within said Units. In no event shall these fire sprinkler systems be a requirement for purposes of construction and/or permitting, but rather only an option payable by purchasers of the Units.

**9.** <u>**Environmental Impact Mitigation**</u>. The Applicant proffers the following for any lot depicted on the GDP as being located within a Critical Resource Protection Area ("CRPA"):

- (a) Subsequent to the issuance of a building permit and prior to the issuance of an occupancy permit for the construction of a single-family dwelling on any residential lot or parcel with lot lines within the CRPA, a sign shall be installed by the developer identifying the landward limits of the CRPA and notification will be provided to the County Zoning Administrator after completion. Such signs shall conform to the Critical Resource Protection Area Signage Policy and shall be installed at the expense of the developer in accordance with the Critical Resource Protection Area Signage Policy.
- (b) No certificate of occupancy shall be issued for a single-family dwelling on any residential lot or parcel with lot lines within the CRPA until the installation of any required plant materials is completed and documentation of such is submitted to the County Zoning Administrator.
- (c) The deeds for such lots shall include deed restrictions providing the following:
  - i. The property owner shall be responsible for the maintenance and replacement of all vegetation as may be required by the provisions of the County's Chesapeake Bay Preservation Area Overlay District.
  - ii. Plant material within the CRPA shall be tended and maintained in healthy growing condition and free from refuse and debris at all times.
  - Diseased plant materials shall be replaced during the next planting season, as may be required by the provisions of the County's Chesapeake Bay Preservation Area Overlay District.
  - No certificate of occupancy shall be issued until the installation of any plant materials required by the County's Chesapeake Bay Preservation Area Overlay District is completed and documentation of such is submitted to the County Zoning Administrator.

**10.** <u>**Historic Preservation**</u>. The Applicant agrees to perform a Phase 1 Archeology Study on the Property if historical artifacts are discovered during development of the Property, and to perform a Phase 2 Archeology Study on the Property if required by the said Phase 1 Archeology Study.

**11**. **Belmont Museum**. The Applicant agrees to **payvoluntarily donate and gift** to the Belmont Museum, upon the approval of the first residential occupancy permit within the Project, the sum of \$30,000.00 for purposes of assisting the museum with any facility improvements or for other general museum purposes.

**12.** Purchase of Development Rights Program. The Applicant will voluntarily donate and gift the aggregate sum of \$500,000.00 directly to the Stafford County Purchase of Development Rights Program ("PDR Program"). This sum shall be paid to the Board of Supervisors for the PDR Program pursuant to the following payment schedule: (a) \$50,000 upon the issuance of a certificate of occupancy permit for the 10<sup>th</sup> residential unit; (b) \$50,000 upon the issuance of a certificate of occupancy permit for the 20<sup>th</sup> residential unit; (c) \$50,000 upon the issuance of a certificate of occupancy permit for the 30<sup>th</sup> residential unit; (d) \$50,000 upon the issuance of a certificate of occupancy permit for the 40<sup>th</sup> residential unit; and (e) the remainder amount of \$300,000 upon the issuance of the certificate of occupancy for the 50<sup>th</sup> residential unit (collectively the "PDR Gift Payment"). In the event the Applicant fails to make the PDR Gift Payment, the said payment shall convert to a cash proffer obligation (the "Cash Proffer Conversion") in an amount of \$600,000 payable to the County upon the issuance of the 51<sup>st</sup> certificate of occupancy permit. The Cash Proffer Conversion, pursuant to the sole discretion of the Board of Supervisors, may be applied to public schools, transportation, parks and recreation, fire and rescue and/or other capital facility programs.

## **<u>13.</u>** <u>**Miscellaneous.**</u> The Applicant agrees to provide the following proffers:

- (a) Proposed development shall be limited to 97 single-family detached dwelling units.
- (b) Open Space Parcels "A" (outside the VEPCO easement) and "D" shall include a 20-foot street buffer, consisting of a double row of evergreen trees, between residential lots and along the Winding Creek Road right-of-way, as shown on the GDP.
- (c) Open Space Parcel "C" shall include a variable width street buffer, consisting of a double row of evergreen trees, between residential lots and along the Winding Creek Road right-of-way, to the maximum extent allowed by the lot configuration generally as shown on the GDP.
- (d) Each lot shall contain foundation landscaping and at least one (1) tree shall be provided in the rear yard, with a 1" caliper or 6-8' tall at planting.

- (e) The Applicant will install and construct a tot lot in the general location as shown on the GDP and a picnic/pavilion area, the availability and location of said picnic/pavilion area to be determined at time of final engineering.
- (f) The Applicant agrees to provide a landscape buffer, consisting of a double row of evergreen trees, between Lot 43 and 44 and the adjacent property owner, as shown on sheet 9 of the GDP.

[AUTHORIZED SIGNATURES TO FOLLOW]

## **APPLICANT ACKNOWLEDGMENT & CONSENT**

Winding Creek Owner<del>,</del> LLC, a Virginia limited liability company

By:	 	
Name: _	 	
Title:		

STATE/COMMONWEALTH OF\_\_\_\_\_, CITY/COUNTY OF \_\_\_\_\_, to wit:

The foregoing instrument was acknowledged before me this \_\_\_\_ day of JanuaryApril, 2017, by \_\_\_\_\_\_, \_\_\_\_\_ of Winding Creek Owner, LLC, on behalf of said company.

\_\_\_\_\_

Notary Public

My Commission expires: \_\_\_\_\_\_ Notary Registration number: \_\_\_\_\_\_

## **OWNERS ACKNOWLEDGMENT & CONSENT**

The Earl F. Musselman Trust created November 28, 2001

BY: \_\_\_\_\_\_ John J. Musselman, Trustee

COMMONWEALTH OF VIRGINIA, CITY/COUNTY OF \_\_\_\_\_FREDERICKSBURG, to wit:

The foregoing instrument was acknowledged before me this \_\_\_\_ day of January\_\_\_\_\_, 2017, by John J. Musselman, Trustee for The Earl F. Musselman Trust created November 28, 2001.

Notary Public

My Commission expires: \_\_\_\_\_ Notary Registration number: \_\_\_\_\_

## EXHIBIT A

## Generalized Development Plan

See attached "Winding Creek Generalized Development Plan" dated May 2014, as last revised August 29, 2016, with addition of <u>revised</u> sheet 11A dated <u>January 23, April 27</u>, 2017, and prepared by Bowman Consulting.

## EXHIBIT B

## **Renderings**

85240378773711-13 039798.00001

Document comparison by Workshare Compare on Friday, May 26, 2017 9:21:45 AM

Input:	
Document 1 ID	interwovenSite://HF_IMAN/IMAN/8524037/1
Description	#8524037v1 <iman> - 1-25-17 WC Proffer Statement</iman>
Document 2 ID	interwovenSite://HF_IMAN/IMAN/8773711/3
Description	#8773711v3 <iman> - 5-24-17 Ver. Winding Creek Owners Proffer Statement</iman>
Rendering set	Standard

_egend:		
<u>Insertion</u>		
<b>Deletion</b>		
Moved from		
Moved to		
Style change		
Format change		
Moved deletion		
Inserted cell		
Deleted cell		
Moved cell		
Split/Merged cell		
Padding cell		

Statistics:		
	Count	
Insertions	50	
Deletions	42	
Moved from	2	
Moved to	2	
Style change	0	
Format changed	0	
Total changes	96	

<sup>&</sup>lt;sup>4</sup> The total estimated value for this improvement is \$412,462.70

Attachment 7 Page 1 of 12

# GENERALIZED DEVELOPMENT PLAN WINDING CREEK GARRISONVILLE/ROCKHILL MAGISTERIAL DISTRICT STAFFORD COUNTY, VIRGINIA



OHN J. MUSSELMAN, TRUSTEE 27 WINDING CREEK ROAD

C/O FRANK LACKMAN 15256 WELTON COURT CENTREVILLE VA 20120 PHONE (703) 463-1808

PLANNING COMMISSION APPROVAL	<b>Ö</b> <b>B</b>
CHAIRMAN STAFFORD COUNTY PLANNING COMMISSION	men Consiling Group, Litt. A News Crea der clanct, Vegnit 2240 der clanct, Vegnit 2240 clant 211-3479 c. (540) 211-3479 c. (540) 211-3479 c. (540) 211-3479 c. (540) 211-3479
SHEET INDEX	882 2 2 1 C
COVER SHEET COVER SHEET COVER SHEET COVER SHEET COVERNMENTAL INFORMETIONS, NOTES AND DETAILS DOYSTING CONDITIONS / SOLIS MAP COVERNLEX DE VISIONTORY FUAN SOLIT DISTINCE PROPLEMENT FUNN SOLIT DISTINCE PROPLES COVERNLEXD LINGSCAPE PUNN OFFSITE IMPROVEMENTS APPENDOX ARCHITECTURAL RENDERINGS (SHEET 1 OF 2) ARCHITECTURAL RENDERINGS (SHEET 2 OF 2) VICINITY SKETCH MAP LEGEND	SHEET CREEK ELOPMENT PLAN
SUBDATISION KEY	
PRIVATE STREET	RC 16151330 COUNTY PROJECT NUMBER
SOHOL LOCATED WITHIN ONE MILE OF THE SITE 	PAR STORES
	DATE     DESCRIPTION       WSP     CVF     WSP       DESCRI     DRIAN     D-RD       SCALE     H     V       JOO NG. S070-05.001     DATE:     MAY 2014       FLE. NG. 3070-0.7-2010     FLE. NG. 3070-0.7-2011

VICINITY MAP

me - P.9370 Musselman Property/9370-03-001 (ENG) - Rezoning/Engineering/Engineering/Plans/9370-D-ZP-001/01-9370-D-ZP 001-CVR.dwo

#### Attachment 7 Page 2 of 12



Cart Ba name : P38370 - Musseiman Property/9370-03-001 (ENG) - Rezoning/Engineering/Engineering Plan/8370-D-ZP-001/02-8370-D-ZP-001-LGD dwg

#### Attachment 7 Page 3 of 12



Cad Be name : P19370 - Musselman Property/9370-03-001 (ENG) - Rezoning/Engineering/Engineering Plans/9370-D-ZP-001/23-9370-D-ZP-001-EXC.deg

#### **Attachment 7** Page 4 of 12

N/A

GRAPHIC SCALE

( IN FEET ) 1 inch = 120 fL

ands (PFO) 1,890

rs of the U.S.

27,004

0.71

DATE DESCRIPTION

SCALE H:

SAG JUF DESIGN DRAWN CHKD

JOB No. 9370-02-002

DATE : June 6, 2016 FILE No. SHEET 4 or 11

31,058

Attach

nt 7 Pa

1 of 11



- sects the western portion of the Project from norm to sock. Enformation was obtained from the UEDA Statifier and Kings George (USDA Natural Resources Conservation Service, Web Soli audiauring nitral.adds gon, Survey Area Data: Version 12, December 13, add in the Solis Summary Table included on the Film.
- An analysis of topographic mapping obtained from the Stafford Co. slopes of 15 to 25 percent, and slopes greater than 25 percent shaded on the Plan. 120E (Effective Date Fe
- According to FEMA Flood Insurance Rate Map No. 510154 2005), a Zone AE foodplain is mapped along Austin Run with E foodplain is mapped all and shown on this Plan.
- reparates and incent to the Feln waters of the ULS of wettind boundaries depicted on this Plan and within definitiated by ISCG based on the requirements of the Copit of En-sition Manual (ESIN) and the Regional Supplement Art for Copit of En-sition Manual (ESIN) and the Regional Supplement Art for Copit of En-sition Manual (ESIN) and the Regional Supplement Art for Copit of En-(5), 2016). The Region Soundaries were confirmed by the ULS Army Co Ensistent M-Mark 2014-00086, dated September 12, 2016), and field vey methods.
- affications (perennial vs. non-perennial, or intern feld assessment by BCG conducted in March and estications (periodial V), non-periodical, or memoriality actuation to the field assessment by ICCS conduction (Match and April 2014 using the A Water County, Alentification Match and April 2014 using the A Water County, Alentification Match and Approved for use by Staffert County, April 25, 2014; Based on the results of the periodial for evaluation, St transition port located approximately 20 feet downlinean from Flags A25 Bream F( Austion Rury within the Project limits should be considered preven-ments located counts within the Project limits should be considered preven-

of the Project was conducted on and Widthe Service (F&WS). DCR), and the Virginia Department 2014). Additionality, a habitat assee I. Federal-listed threatened ama were observed within the Project area used on existing habitat results

Based on a review of the V formation System (V-CRI5) (Mps./k-crit.db/viginiti.g i sates or architectural resources or existing structures confit (Dat Geo-Sc20) (Embryoy-Emglain Centretery) is identifi-t of the Project on Parcel 20-AC, according to the DHR Arc is recommended as not eligible for lating on the Nation /, Accther centery – Gariston Family Centerlary #1 – wait own on this Plan. Adverse impacts to hi ject.

More impacts to environmentally assessive features (wetterskin and atterning are proposed with the development of hereign Convert. There may also which the three three threefolds of the Vorgina Water Insteador (WM) General Permit WM and the States Convert Permit Of 1.5 and Permittening appropriate complematicity intigation will be pro-indicated and the states of the state of the states appropriate complematicity intigation will be pro-indicated and the state of the state of the states appropriate complematicity intigation will be pro-indicated and the states appropriate complematicity intigation will be pro-indicated and the states appropriate complematicity intigation and and the states and the states and the states and the states of the state and the states and the states and approximation of the states and the states

Map Unit	Map Unit Name	Class <sup>1</sup>	Solls List <sup>1</sup>	Component
Ap	Albuvial kand, well	PD	Yes	Allowial land, wet (05%)
AlB	Appling fine sandy loam, 2 to 6 percent slopes	wo	No	NA
AIC2	Appling fine sandy loam, 6 to 15 percent slopes, eroded	WD	No	1654
AsD	Ashiar fine sandy loam. 6 to 15 percent slopes	WD	No	NIA
Beili	Bourne fine sandy loam. 2 to 6 percent slopes	MWD	No.	NA
BesC2	Bourne fine sandy loam, 6 to 10 percent slopes, wroded	MWD	No	NOA
C#82	Carolice fine sandy loarn. 2 to 6 percent alopts. eroded	WD	No	NUA
CeC2	Caroline fine sandy loam. 6.5o 10 percent alopes. eroded	WD	No	NO
CaD2	Caroline fine sandy loam. 10 to 12 percent alopes. eroded	WD	No	NIA
G6D3	Carotine clay loam, 10 to 18 percent slopes, severely ended	WD	No	NEA
Ce .	Cartecay fine sandy loam	SPD	Yes	Carbecay (85%) Alluvial land, wet (5%) Wehadkee (3%)
OrB	Orange loam. 2 to 6 percent slopes	MWD	No	NA
TelB	Tetotum line sandy loam, 2 to 6 percent aloptes	MWD	No	NA

and the instance is a first the Stational and King General Coursess Westing auditabal St

#### Attachment 7 Page 5 of 12



Cad file name : P19370 - Musselman Property/9370-03-001 (ENG) - Rezoning/Engineering/Engin

#### Attachment 7 Page 6 of 12



Cad Baname : P10370 - Musselman Property 0370 03-001 (ENG) - Reconing/Engineering/Engineering Plane/0370-D-ZP-00106-08 9370-D-ZP-001-GDP.dwg

#### Attachment 7 Page 7 of 12



#### Attachment 7 Page 8 of 12



#### Attachment 7 Page 9 of 12







Cad lite name : P:0370 - Musselman Property/5375-03-001 (ENG) - Rezoning/Engineering/Engineering Plans/9370 D-ZP-00110-9370 D-ZP-001-GLP-dwg



Cad tile name : P19370 - Musselman Property/8370-03-001 (ENG) - Rezoning/Engineering/Engineering Plans/9370-D-ZP-001/11-9370-D-ZP-001-GDP-OFFSITE.dwg



Cad Ille name: P:8370 - Musselman Property/9370-03-001 (ENG) - RezonlegiEngIneering/EngIneering/Plans/9370-D-ZP-001/11-9370-D-ZP-001-GDP-OFFSITE-STOCKS.dwg

### Attachment 8 Page 1 of 2















Stafford County, Virginia May 12, 2014

ARCHITECTURAL ELEVATION ILLUSTRATIVE

Winding Creek

#### Attachment 8 Page 2 of 2













Stafford County, Virginia May 12, 2014

ARCHITECTURAL ELEVATION ILLUSTRATIVE

Attachment 9 Page 1 of 113



Traffic Impact Analysis Winding Creek Stafford County, Virginia

**Prepared for:** Winding Creek Owner, LLC

May 9, 2014 Revised June 13, 2016

Attachment 9 Page 2 of 113



# **Traffic Impact Analysis**

# **Winding Creek**

Stafford County, Virginia

June 13, 2016

Prepared for:

Winding Creek Owner, LLC 15256 Welton Court Centreville, Virginia 20120

Prepared by:

Ann Jackson, PE Carlos G. Garcia, PE

Bowman Consulting Group, Ltd. 3951 Westerre Parkway, Suite 150 Richmond, Virginia 23233 Phone: 804.616.3240 Fax: 804.270.2008

Bowman Job # 009370-03-001





## **TABLE OF CONTENTS**

1.	INTRO	DUCTION AND SUMMARY1
	1.1.	Purpose and Study Objectives1
	1.2.	Executive Summary1
2.	BACKG	ROUND INFORMATION
	2.1.	Existing Land Uses and Zoning
	2.2.	Proposed Land Uses and Zoning
	2.3.	Existing Network Roadways10
	2.4.	Other Modes of Transportation11
	2.5.	Future Network Roadways and Improvements
	2.6.	Geographic Scope and Limits of Study Area15
	2.7.	Scenario Scope15
	2.8.	Traffic Analysis Procedure15
	2.9.	Traffic Analysis Software Inputs16
3.	PROJE	CTED 2016 TRAFFIC CONDITIONS17
	3.1.	Projected 2016 Peak Hour Traffic Counts17
	3.2.	Analysis of Projected 2016 Peak Hour Traffic Conditions17
4.	BACKG	ROUND FUTURE TRAFFIC CONDITIONS (2021)
	4.1.	Other Developments
	4.2.	Background Traffic Growth
	4.3.	2021 Background Future Traffic Forecasts (without Development)23
	4.4. Deve	Analysis of 2021 Background Future Peak Hour Traffic Conditions (without opment)
5.	SITE TH	RIP GENERATION – WINDING CREEK
	5.1.	Site Trips
6.	SITE TH	RIP DISTRIBUTION AND ASSIGNMENTS

bowmanconsulting.com

	6.1 Site Trip Distribution and Assignments	
7.	2021 TOTAL FUTURE TRAFFIC CONDITIONS	
	7.1. 2021 Total Future Traffic Forecasts (with Development)	32
	7.2. Analysis of 2021 Total Future Peak Hour Traffic Conditions	32
8.	TURN LANE WARRANT ANALYSIS	
9.	RECOMMENDATIONS AND CONCLUSIONS	



## **LIST OF FIGURES**

<u>Figure</u>	Title	<u>Page</u>
1	Site Location Map - Regional	4
2	Site Location Map – Local	5
3	Subject Parcel and Existing Zoning Map	6
4	Proposed Zoning Map	7
5	Generalized Development Plan	8
6	Stafford County Future Land Use Map	9
7	Existing Lane Use and Traffic Control	12
8	Future Lane Use and Traffic Control (2021)	14
9	Projected 2016 Peak Hour Traffic Counts	18
10	Projected 2016 Peak Hour Levels of Service	. 20
11	Location of Other Developments	22
12	Background Growth (2021)	24
13	Total Background Traffic Forecasts (2021)	25
14	Background (2021) Peak Hour Levels of Service	27
15	Site Generated Site Trip Distributions	30
16	Site Generated Traffic Assignments	31
17	Total Future Traffic Forecasts (2021)	33
18	Total Future Peak Hour Levels of Service (2021)	34

## LIST OF TABLES

Table	Title	Page
1	HCM Level of Service Criteria	. 16
2	Analysis Summary of Peak Hour Conditions	19
3	Site Trip Generation Analysis	28



## LIST OF APPENDICES

- Appendix <u>Title</u>
  - A Scoping Agreement
  - B Raw Traffic Data
  - C Projected 2016 Peak Hour Analysis Worksheets
  - D Historic VDOT Traffic Counts
  - E Other Development Traffic Assignments
  - F Background (2021) Peak Hour Analysis Worksheets
  - G Total Future (2021) Peak Hour Analysis Worksheets
  - H Turn Lane Warrant Analysis



## 1. INTRODUCTION AND SUMMARY

## 1.1. Purpose and Study Objectives

This report summarizes the findings of the revised traffic impact analysis (TIA) that was performed by Bowman Consulting Group (BCG) for the proposed Winding Creek development in Stafford County, Virginia. The purpose of this study is to determine the impact to the surrounding roadway network caused by the traffic generated by the proposed development.

Please note that this revised TIA was completed based on feedback received from the County and local residents. The revision to this TIA include the elimination of the secondary access via an extension of Fireberry Boulevard. The 2014 traffic data was projected to 2016 for analysis purposes.

## 1.2. Executive Summary

The subject property is generally located along both sides of Winding Creek Road (Route 628), north of Courthouse Road (Route 630) and Embrey Mill Road (Route 733), and southwest of Eustace Road in Stafford County, Virginia. The approximately 61.23 acres site is currently zoned Agriculture (A1) and the Applicant, Winding Creek Owner, LLC, is seeking to rezone the property to Residential (R1 Cluster).

The project does not meet thresholds for a Virginia Department of Transportation (VDOT) Chapter 527 traffic study but does meet Stafford County thresholds (1,000 trips per day) for a traffic study. The scope of this study was developed in consultation with VDOT and Stafford County staff at a scoping meeting held on March 25, 2014 and in subsequent correspondence. A copy of the signed scoping documents is included in Appendix A.

1
With the rezoning, the Applicant is proposing to develop the site with 97 single-family residential dwelling units. All residential units would be located on the eastern side of Winding Creek Road with the property on the western side being open space.

Development of the Winding Creek is expected to occur in one phase and was assumed to be complete by 2021. When complete, on an average weekday, the development would generate approximately 78 new trips during the AM peak hour (20 in and 58 out), 102 new trips during the PM peak hour (64 in and 38 out), and 1,021 new daily trips over a 24-hour period.

Access to the site is proposed via two full movement entrances from Winding Creek Road.

Based on the scoping agreement shown in Appendix A, it was determined that the study area should include the following intersections:

- 1. Winding Creek Road/Embrey Mill Road
- 2. Eustace Road/Live Oak Lane/Middle School Entrance
- 3. Eustace Road/Northampton Boulevard/Hampton Park Road
- 4. Winding Creek Road/Site Entrance #1 (North)
- 5. Winding Creek Road/Site Entrance #2 (South)

As agreed upon with VDOT and Stafford County, the Courthouse Road/Winding Creek Road intersection was not analyzed in this report. With the current plans to widen Courthouse Road (Route 630), the intersection would be realigned to include Ramoth Church Road with new turn lanes and a traffic signal and is anticipated to adequately accommodate future traffic conditions.

Analysis indicates that 2021 traffic conditions with the buildout of the Winding Creek would be adequately accommodated at the study intersections with no offsite improvements.

# 2. BACKGROUND INFORMATION

The development is to be located along both sides of Winding Creek Road, north of Courthouse Road and Embrey Mill Road, and southwest of Eustace Road in Stafford County, Virginia as shown on Figures 1 and 2. Figure 1 shows the regional location of the project while Figure 2 shows the local location. The approximately 61.23 acres site (Tax Map Parcel 29-4) is currently zoned Agriculture (A1). The Applicant, Winding Creek Owner, LLC, is seeking to rezone the site to Residential (R1 Cluster). Refer to Figure 3 for a map of the subject parcel including the current zoning and Figure 4 for the proposed zoning.

With the rezoning, the Applicant is proposing to develop the site with 97 single-family residential dwelling units. Figure 5 shows the Generalized Development Plan for the site.

# 2.1. Existing Land Uses and Zoning

The existing land uses in the study area consist primarily of a mix of undeveloped land, single-family residential development, and several schools. The land surrounding the site is predominantly zoned Agriculture (A1) and Residential (R1). Refer to Figure 3 for the existing zoning in the study area.

# 2.2. Proposed Land Uses and Zoning

Stafford County's Future Land Use Plan designates the subject parcel as Suburban as shown on Figure 6. The proposed rezoning and subsequent development would align with the County's designation.



#### Attachment 9 Page 10 of 113



#### Attachment 9 Page 11 of 113



#### Attachment 9 Page 12 of 113



#### Attachment 9 Page 13 of 113









# 2.3. Existing Network Roadways

Regional access to the site would be provided via Courthouse Road (Route 630) and Garrisonville Road (Route 610). Local access would be provided via Winding Creek Road (Route 628) and Eustace Road (Route 751) and Embrey Mill Road (Route 733).

<u>Winding Creek Road (Route 628)</u> is a two lane undivided urban local roadway with a posted speed limit of 35 mph in the vicinity of the site that connects Courthouse Road to the southeast with Shelton Shop Road to the northwest. According to the most recent VDOT data (2012), Winding Creek Road carries approximately 3,900 vehicles per day south of Embrey Mill Road and 2,100 north of Embrey Mill Road.

For purposes of this study, Winding Creek Road was assumed to run north-south through the study area.

<u>Eustace Road</u> is a two lane undivided local street with a posted speed limit of 25 mph that connects Embrey Mill Road to the southwest with Garrisonville Road to the north. According to the most recent VDOT data (2012), Eustace Road carries approximately 3,000 vehicles per day.

For purposes of this study, Eustace Road was assumed to run north-south through the study area.

<u>Embrey Mill Road (Route 733)</u> is a two lane undivided local street with a posted speed limit of 30 mph that provides access to single family residential between Winding Creek Road and Eustace Road. According to the most recent VDOT data (2012), Embrey Mill Road carries approximately 2,400 vehicles per day.

Embrey Mill Road currently terminates east of Eustace Road but the Embrey Mill development has proffered to extend the road east to provide a connection into the Embrey Mill development. As agreed upon in the scoping process, this connection was not assumed to be in place in this study.



For purposes of this study, Embrey Mill Road was assumed to run east-west through the study area.

Existing lane configurations (number of traffic lanes on the intersection approaches), storage lane lengths, and other intersection and roadway information within the study area were collected through field reconnaissance and are shown on Figure 7.

## 2.4. Other Modes of Transportation

This study also reviews the potential for walking, bicycling, and transit trips to and from the area.

<u>Walking Facilities</u> – Currently there are no sidewalks along Winding Creek Road or Embrey Mill Road in the vicinity of the site. There are concrete sidewalks along Eustace Road in the immediate vicinity of H.H. Poole Middle School as well as asphalt pedestrian trails on one or both sides of Eustace Road between Embrey Mill Road and Northampton Boulevard. The Winding Creek concept plan shows sidewalks/trails within the proposed development. However, given the residential nature of the development and the lack of sidewalks on Winding Creek Road to provide pedestrian connections, it is unlikely that a significant number of trips would be made via walking. Therefore, no reductions in site generated trips were taken in this analysis for walking.

Pedestrian counts were taken during both peak hours at the Eustace Road/Live Oak Lane/H.H. Poole Middle School Entrance intersection only. These counts were used strictly for observing traffic trends associated with the Middle School during peak hour conditions.



Attachment 9 Page 18 of 113



<u>Bicycling Facilities</u> – Currently, there are multi-use trails along the east side of Eustace Road, and the south side of Hampton Park Road but not on any other study roadway. While bicycle trips are possible, without existing bicycle facilities on the majority of the roadways, it is unlikely that a significant portion of the site trips would be made via bicycle. Therefore, no reductions in site generated trips were taken in this analysis for bicycling.

<u>Transit Facilities</u> – Fredericksburg Regional Transit (FRED) Route D6 provides bus service along Garrisonville Road, Eustace Road, and Hampton Park Boulevard. However, without sidewalks to connect to the bus stops, it is unlikely that a significant portion of the site trips would be made via transit. Therefore, no reductions in site generated trips were taken in this analysis for transit.

# 2.5. Future Network Roadways and Improvements

At the time of this analysis, there are no known improvements that are currently committed to any of the study intersections within the analysis timeframe of the study.

Refer to Figure 8 for the Future Lane Use and Traffic Control in 2021 with the development of Winding Creek.



Attachment 9 Page 20 of 113



# 2.6. Geographic Scope and Limits of Study Area

Based on the scope of work meeting held with VDOT and Stafford County on March 25, 2014 the scope of the study was agreed upon and is summarized in the signed pre-scope of work forms included in Appendix A.

As a result, the following intersections were identified to be studied in this analysis:

- 1. Winding Creek Road/Embrey Mill Road
- 2. Eustace Road/Live Oak Lane/Middle School Entrance
- 3. Eustace Road/Northampton Boulevard/Hampton Park Road
- 4. Winding Creek Road/Site Entrance #1 (North)
- 5. Winding Creek Road/Site Entrance #2 (South)

# 2.7. Scenario Scope

Based on the scope of work meeting and subsequent correspondence, the following scenarios were identified to be studied with this report:

- Projected 2016 conditions
- 2021 Background Future Conditions
- 2021 Total Future Conditions (includes the Winding Creek)

# 2.8. Traffic Analysis Procedure

The study intersections were analyzed for each scenario using the Highway Capacity Manual (HCM) methodologies and using the computer software package Synchro 8 with SimTraffic. The analysis uses capacity, Level of Service, control delay, and queuing as the criteria for the performance of the intersections.

Capacity, as defined by the HCM, is a measure of the maximum number of vehicles in an hour that can travel through an intersection or section of roadway under typical conditions. Level of Service (LOS) is a marker of the driving conditions and perception of drivers while traveling during the given time period. LOS ranges from LOS "A" which represents free flow conditions, to LOS "F" which represents



breakdown conditions. Table 1 shows the LOS for intersections as defined by the HCM.

Unsignal	ized Intersections	Signalized Intersections					
Level of Service	Average Control Delay (sec/veh)	Level of Service	Average Control Delay (sec/veh)				
А	≤10	А	≤10				
В	>10-15	В	>10-20				
С	>15-25	С	>20-35				
D	>25-35	D	>35-55				
E	>35-50	E	>55-80				
F	≥50	F	≥80				

Table 1 - HCM Level of Service Criteria

Typically, LOS "A" through "D" is considered acceptable, while LOS "E" and "F" are considered failing or unacceptable. Control delay is a measure of the total amount of delay experienced by an individual vehicle and includes delay related to deceleration, queue delay, stopped delay, and acceleration. Table 1 shows the amount of control delay (in seconds per vehicle) that corresponds to the LOS for signalized and unsignalized intersections.

The reported queues, or linear distance of delayed vehicles, in this study are 95<sup>th</sup> percentile queues as reported by SimTraffic. They are reported to ensure that the storage lengths of lanes at intersections are of adequate length and that queued vehicles will not interfere with free flow vehicles or adjacent intersections.

# 2.9. Traffic Analysis Software Inputs

All intersections were analyzed with the default heavy vehicle percentage (2%) and peak hour factor (0.92). All other software defaults remain unchanged.



# 3. PROJECTED 2016 TRAFFIC CONDITIONS

# 3.1. Projected 2016 Peak Hour Traffic Counts

Traffic peak hour turning movement traffic counts were conducted by Bowman Consulting Group (BCG) at the existing study intersections in June, 2013 and April, 2014. The counts were conducted on a typical weekday from 7:00-9:00 AM and 4:00-6:00 PM when public schools were in session.

The raw traffic data is included in Appendix B and is summarized on Figure 9. Estimates of the Average Daily Traffic (ADT) are also included on Figure 9 for select road segments and were obtained from the most recent VDOT data (2012).

Projected 2016 peak hour traffic counts were calculated using the 2014 peak hour traffic counts and a growth factor of 2.5% per year (compounded annually over 2 years). Projected 2016 growth was estimated at 5% for 2016.

# 3.2. Analysis of Projected 2016 Peak Hour Traffic Conditions

The analysis of projected 2016 peak hour traffic conditions was based on the analysis procedures described above, the existing lane use and traffic control shown on Figure 7 and the projected 2016 peak hour traffic counts shown on Figure 9.

The calculation worksheets are included in Appendix C, and the results of the analysis are summarized in Table 2 and are shown graphically on Figure 10. Table 2 also indicates the assumed direction of each roadway at the intersection.

As shown in Table 2, each of the turning movements currently operate at LOS "C" or better during both of the peak hours with the following exception:

 At the Eustace Road/Northampton Boulevard/Hampton Park Road intersection (Study Intersection #5), the westbound through-right movement operates at LOS E during the PM peak hour.

As shown in Table 2, each of the 95<sup>th</sup> percentile queues are contained within the available storage.



Attachment 9 Page 24 of 113



# Table 2 – Analysis Summary of Peak Hour Conditions

						Projected	2016					Background	d 2021					Total Futur	e 2021		
Intersection	Control	Lane Group	Available Storage <sup>1</sup>	<u>AM Peak I</u> Lane LOS <sup>(2)</sup> I	<u>Hour Si</u> Lane Q Delay ec/veh)	imTraffic ueue <sup>(3)</sup> (ft)	<u>PM Peak Hc</u> Lane Lá LOS <sup>(2)</sup> De (sec	<u>bur Sin</u> ane Qu Alay (Veh)	n <u>Traffic</u> Leue <sup>(3)</sup> (ft) L	<u>AM Peak H</u> Lane L .OS <sup>(2)</sup> D) (se	<u>lour Sin</u> ,ane Qu elay (c/veh)	n <u>Traffic</u> Leue <sup>(3)</sup> (ft)	<u>PM Peak Ho</u> Lane LOS <sup>(2)</sup> E (se	<u>ur Sir</u> Lane Qu Delay sc/veh)	n <u>Traffic</u> leue <sup>(3)</sup> (ft) L	<u>AM Peak I</u> -ane .OS <sup>(2)</sup> (s	<u>Hour S</u> Lane G Delay ec/veh)	i <u>im Traffic</u> Queue <sup>(3)</sup> (ft)	<u>PM Peal</u> Lane LOS <sup>(2)</sup>	t <u>Hour</u> Lane Delay (sec/veh)	<u>SimTraffic</u> Queue <sup>(3)</sup> (ft)
<ol> <li>Winding Creek Road (N-S)/ Site Entrance #1 (E-W)</li> </ol>	Stop	SBTL WBLR	2 2	FUTL	JRE SCENAR	Q	FUTUR	E SCENARIC		FUTUR	E SCENARIO		FUTURE	SCENARIO		A A	0.0 9.8	~ 40	A B	7.6 10.0	0 35
<ol> <li>Winding Creek Road (N-S)/ Site Entrance #1 (E-W)</li> </ol>	Stop	SBTL WBLR	2 2	FUIL	JRE SCENAR	Q	FUTUR	E SCENARIC		FUTUR	E SCENARIO		FUTURE	SCENARIO		B	7.5 10.1	~ 110	A B	7.7 10.4	36
<ol> <li>Winding Creek Road (N-S)/ Embrey Mill Road (E-W)</li> </ol>	Stop	SBTL WBLR	2 2	A B	8.0 12.0	26 66	A 8	7.9 2.8	~ 50	A B	7.8 11.3	27 42	A B	7.8 11.6	~ 47	B	7.9 12.8	23 27	A B	7.9 13.4	86
<ol> <li>Eustone Road (N.S)/ Live Oak Lane (E.W)/ Middle School Entrance (E-W)</li> </ol>	Stop Stop	NBLTR SBLTR EBLTR WBLTR		A A O B	8.0 8.1 14.2	23 74 57 33	< < O O	3.5 3.0 8.0 6.7	49 58 37 38	A A O W	7.9 8.0 11.1	~ 21 32 32	< < ט ט	8.5 7.9 17.0 16.5	79 24 38	A A O B	8.0 8.0 12.2	76 83 39	< < ט ט	8.6 8.0 18.0 17.3	38 70 63 43
<ol> <li>Eustapos Road (N-S)/ Northtampton Boulevard (E-W)/ Hampton Park Road (E-W)</li> </ol>	Stop Stop Stop Stop Stop Stop	NBLT NBR SBL SBTR EBL EBL EBL WBL WBTR	~ 175 ~ 125 ~ 175 ~	$\mathbf{v} < \mathbf{v} < \mathbf{v}$	10.8 9.6 9.9 10.2 9.2 11.3	60 55 67 33 33 33 33 33	因 < 因 因 因 因 A 王 	1.7 9.8 0.5 0.6 9.4 8.5 0.0 2.4 8.4 8.4 8.4 8.4 8.4 8.4 8.4 8.4 8.4 8	36 71 92 25 286 286		10.7 9.5 9.4 10.1 10.5 10.7	71 39 65 57 224 72	B < B B B B B B B B B B B B B B B B B B	11.4 9.5 12.4 14.3 11.2 9.8 38.6	43 42 60 94 71 25 280 280	© < < < ∞ ∞ < ∞	11.4 8.0 9.5 10.2 9.1 11.0 11.0	44 55 65 65 47 47 70 70	$\square < \square \bigcirc \square \bigcirc < \square \bigcirc < \square$	12.0 9.7 16.1 10.4 15.7 10.0 43.3	36 58 76 69 132 132
Notes:			1			-						-			-						

Indicates a continuous lare.
 Level of Service based on HCM 2010 criteria as reported by Synchro 8.
 Queues are average 95th percentile queues as reported by SimTraffic after 10 runs of 60 minutes each.

Attachment 9 Page 25 of 113

bowmanconsulting.com

Attachment 9 Page 26 of 113



# 4. BACKGROUND FUTURE TRAFFIC CONDITIONS (2021)

In order to analyze future traffic conditions, without the development of the proposed Winding Creek project, background traffic conditions were forecasted based on the 2014 traffic counts, other approved but unbuilt developments in the area, and historic traffic growth.

# 4.1. Other Developments

There are two other approved but unbuilt developments (Shelton Knolls and Shelton Woods) in the study area that would be complete by 2021.

Shelton Knolls is generally located along the eastern side of Shelton Shop Road (Route 648) north of the intersection with Courthouse Road (Route 630) as shown on Figure 11. Shelton Knolls is expected to be complete by 2021 and would consist of 94 single-family dwelling units. The trips that would be generated by Shelton Knolls were obtained from the Bowman Consulting Group (BCG) TIA dated August 2013 and are included in Appendix D.

Shelton Woods is generally located along the northern side of Courthouse Road, east of Shelton Shop Road and west of Lynhaven Lane as shown on Figure 11. Shelton Woods was assumed to be complete by 2021 and would consist of 95 single-family dwelling units. The trips that would be generated by Shelton Woods were obtained from the BCG TIA dated October 2012 ("The Woods at Augustine") and are included in Appendix D.

As shown in Appendix D, neither of the background developments generate trips that are anticipated to appear on any of the study intersections. Therefore no other development trips were included in the Total Background Traffic Forecasts (2021).



#### Attachment 9 Page 28 of 113



# 4.2. Background Traffic Growth

In order to account for development outside of the study area, background traffic growth rates were estimated for each of the roadways in the study area based on historic VDOT traffic counts. The counts are included in Appendix E and the annual growth rates are shown in Table E.1.

As shown in Appendix E, the roadways in the vicinity of the site have experienced flat to negative growth from 2007-2012. However, this is not expected to continue as the area builds out.

In order to be conservative, and as agreed upon in the scoping agreement, an annual growth rate of 2.5% was applied to all of the study roadways.

In order to determine 2021 traffic conditions, the annual 2.5% growth rate was compounded annually for the seven-year period from the date of the 2014 counts. Background traffic growth was, therefore, estimated at 18.9% for the 2021 scenario. The growth rate was applied to all movements on the roadways and the resulting growth is shown on Figure 12.

# 4.3. 2021 Background Future Traffic Forecasts (without Development)

The background traffic growth shown on Figure 12 was then added to the existing traffic counts shown on Figure 9 to yield the Total Background Traffic Forecasts (2021). These forecasts are shown on Figure 13 and show the AM and PM peak hour forecasts as well as the projected ADT rounded to the nearest 50.



Attachment 9 Page 30 of 113



Attachment 9 Page 31 of 113



# 4.4. Analysis of 2021 Background Future Peak Hour Traffic Conditions (without Development)

The analysis of 2021 Background Future peak hour traffic conditions was based on the analysis procedures described above, the existing lane use and traffic control shown on Figure 7, and the 2021 Background Future Traffic Forecasts shown on Figure 13.

The calculation worksheets are included in Appendix F and the results of the analysis are summarized in Table 2 and shown graphically on Figure 14. Table 2 also indicates the assumed direction of each roadway at the intersection.

As shown in Table 2, under Background 2021 conditions, each of the turning movements would continue to operate at LOS "C" or better during both peak hours with the exception of the westbound through-right movement at the Eustace Road/Northampton Boulevard/Hampton Park Road intersection (Study Intersection #5) which would continue to operate at LOS "E" during the PM peak hour.

As shown in Table 2, under Background 2021 conditions, each of the 95<sup>th</sup> percentile queues would continue to be contained within the available storage.



Attachment 9 Page 33 of 113



# 5. SITE TRIP GENERATION – WINDING CREEK

The Winding Creek development is proposed to consist of 97 single-family residential dwelling units. Primary access to the site is proposed via two full movement entrances from Winding Creek Road.

The average weekday AM and PM peak hour, and weekday and average daily trips that are expected to be generated by the Winding Creek development were estimated using the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 9<sup>th</sup> edition and are shown in Table 3.

						<u>Week</u>	<u>day</u>		
		Land Use	A	M Peak	Hour	PI	M Peak H	lour	Daily
Land Use	Size Units	Code	In	Out	Total	In	Out	Total	Trips
Proposed Winding Creel Development									
By-Right									
Single-Family Detached	21 D U	210	6	18	24	16	10	26	250
	21 0.0.	210	Ū	10	2.	10	10	20	200
Proposed Zoning									
Single-Family Detached	97 D.U.	210	20	58	78	64	38	102	1,021
Difference (Proposed - By-Right)					54			76	771

## Table 3 – Site Trip Generation Analysis

Notes: (1) Based on the Institute of Transportation Engineers Trip Generation, 9th Edition.

# 5.1. Site Trips

As shown in Table 3, the Winding Creek development would generate approximately 78 new trips during the AM peak hour (20 in and 58 out), 102 new trips during the PM peak hour (64 in and 38 out), and 1,021 new daily trips over a 24-hour period. As discussed previously, no reductions were assumed for other modes of transportation.

Table 3 also shows the by-right trip generation should the property be developed under the current A1 zoning (21 single family dwelling units). As shown in Table 3,



the by-right development would generate approximately 24 new trips during the AM peak hour (6 in and 18 out), 26 new trips during the PM peak hour (16 in and 10 out), and 250 new daily trips over a 24-hour period.

The rezoning and subsequent development would result in an additional 54 new AM peak hour trips, 76 new PM peak hour trips, and 771 new daily trips over a 24-hour period.

# 6. SITE TRIP DISTRIBUTION AND ASSIGNMENTS

# 6.1 Site Trip Distribution and Assignments

The overall site trip distributions were based on previously approved traffic studies, the nature of the development, the regional traffic network, and engineering judgment. Generally, the majority of residential traffic in the region travels to the east and north in the morning and back in the evening.

The overall site trip distribution was therefore assumed as follows:

- 50% to/from the East on Courthouse Road
- 40% to/from the North on Eustace Road
- 5% to/from the Northwest on Winding Creek Road
- 5% to/from the South on Ramoth Church Road

The overall distributions were assigned to the local roadway network and site entrances as shown on Figure 15. The site trips shown on Table 3 were then distributed to the study intersections using the percentages shown on Figure 15. The resulting AM peak hour, PM peak hour, and average daily site trip assignments are shown on Figure 16 for the Winding Creek development.



Attachment 9 Page 36 of 113



Attachment 9 Page 37 of 113



# 7. 2021 TOTAL FUTURE TRAFFIC CONDITIONS

# 7.1. 2021 Total Future Traffic Forecasts (with Development)

The Site Generated Traffic Assignments shown on Figure 16 were then added to the Total Background Traffic Forecasts (2021) shown on Figure 13 to yield the Total Future Traffic Forecasts (2021). These forecasts are shown on Figure 17 and show the AM and PM peak hour forecasts as well as the projected ADT rounded to the nearest 50.

# 7.2. Analysis of 2021 Total Future Peak Hour Traffic Conditions

The analysis of the 2021 Total Future peak hour traffic conditions was based on the analysis procedures described above, the future lane use and traffic control shown on Figure 8 and the 2021 Total Future Traffic Forecasts shown on Figure 17.

The calculation worksheets are included in Appendix G and the results of the analysis are summarized in Table 2 and shown graphically on Figure 18. Table 2 also indicates the assumed direction of each roadway at the intersection.

As shown in Table 2, under Total Future 2021 conditions, each of the turning movements is expected to operate at LOS "C" or better with the exceptions noted under background conditions.

As shown in Table 2, under Total Future 2021 conditions, each of the 95<sup>th</sup> percentile queues is expected to continue to be contained within the available storage.



Attachment 9 Page 39 of 113



Attachment 9 Page 40 of 113



# 8. TURN LANE WARRANT ANALYSIS

An analysis was conducted to determine if right and left turn lanes would be warranted at the site entrances on Winding Creek Road.

The turn lane warrant analysis was completed using the Total Future Traffic Forecasts shown on Figure 17, and Figures 3-5 and 3-26 from Appendix F of the VDOT Road Design Manual. The results of the analyses are included in Appendix H.

The analysis indicates that neither northbound right turn lanes nor southbound left turn lanes are warranted at either site entrances on Winding Creek Road.

# 9. **RECOMMENDATIONS AND CONCLUSIONS**

The conclusions of the Traffic Impact Analysis completed for the proposed Winding Creek development indicate that the traffic conditions at buildout of the proposed development are expected to be adequately accommodated at the study intersections with no offsite improvements.



# **APPENDIX A**

# TRAFFIC STUDY SCOPING AGREEMENT





# PRE-SCOPE OF WORK MEETING FORM

Information on the Project Traffic Impact Analysis Base Assumptions

The applicant is responsible for entering the relevant information and submitting the form to VDOT and the locality no less than three (3) business days prior to the meeting. If a form is not received by this deadline, the scope of work meeting may be postponed.

<b>Contact Information</b>								
Consultant Name: Tele: E-mail:	Bowman Consulting - Carlos G. Garcia, PE 804-616-3240 cgarcia@bowmancg.com							
Developer/Owner Name: Tele: E-mail:	Winding Creek Owner, LLC							
<b>Project Information</b>								
Project Name:	Winding Creek         Locality/County:         Stafford County							
Project Location: (Attach regional and site specific location map)	Generally located alo Road and Embrey Mi shown on Figure 1.	ng both sides of Wind ill Road, and southeast lax Map Parcel 29-4.	ing Creek Road, nort of Walpole Street/Fl	h of Courthouse atford Road as				
Submission Type	Comp Plan	Rezoning 🛛	Site Plan	Subd Plat				
Project Description: (Including details on the land use, acreage, phasing, access location, etc. Attach additional sheet if necessary)	The applicant is prop Agriculture (A-1) to l units in one phase. T access is to be provid Road which would se	osing to rezone the app Residential (R-1) to all he site is bifurcated by ed via two full movem erve both the eastern an	proximately 66 acre s ow up to 97 single fa Winding Creek Roa ent entrances from W id western lots.	ite from mily residential d and primary vinding Creek				
Proposed Use(s): (Check all that apply; attach additional pages as necessary)	Residential 🛛 Commercial 🗌 Mixed Use 🗌 Other 🗌							
	Residential Uses(s) Number of Units:	97						
	ITE LU Code(s): Commercial Use(s)	210	<b>Other Use(s)</b> ITE LU Code(s):					
	Square Ft or Other Va	ariable:	Independent Variable	(s):				
Total Peak Hour Trip Projection:	Less than 100	100 – 499 🖂	500 – 999 🔲	1,000 or more 🗌				

It is important for the applicant to provide sufficient information to county and VDOT staff so that questions regarding geographic scope, alternate methodology, or other issues can be answered at the scoping meeting.
Traffic Impact Analy	sis Assumptions					
Study Period	Existing Year: Projected 2016 (Used counts from 2014)	Build-ou	it Yea	ar: 2021		Design Year:
Study Area Boundaries	North: Northampton	Blvd	SOL	th: Courth	iouse Ro	bad
(Attach map)	East: Eustace Road		We	st: Embre	y Mill R	Load
External Factors That Could Affect Project (Planned road improvements, other nearby developments)	Background Develop - Shelton Woods (Tr - Shelton Knolls	nents: affic study su	ıbmit	ited under '	'Woods	at Augustine")
Consistency With Comprehensive Plan (Land use, transportation plan)	Stafford County Futur proposed rezoning is	e Land Use F consistent wit	Plan o th a S	calls for the Suburban de	e parcel esignati	to be Suburban. The on.
Available Traffic Data (Historical, forecasts)	Historic VDOT ADT	counts (2014	)			
Trip Distribution	Road Name: Courtho East 50%	use Road -	Ro	ad Name:	Eustac	e Road - North 40%
(Attach sketch)	Road Name: Winding Road - Northwest 5%	g Creek	Ro 5%	ad Name:	Ramot	h Church Road - South
Annual Vehicle Trip	2.5% Pe	ak Period for eck all that app	or St ly)	udy		м 🛛 РМ 🗌 SAT
Growuri Kate.	Pe	ak Hour of t	he G	ienerator		
	1.Winding Creek Roa Mill Road	l/Embrey	6.			
Study Intersections	2.Eustace Road/Live C Lane/Middle School E	Dak ntrance	7.			
and/or Road Segments (Attach additional sheets as	3.Eustace Road/North	ampton Blvd	8.			
necessary)	4. Winding Creek Roa Entrance	l/Site	9.			
	5.		10	•		
Trip Adjustment Factors	Internal allowance: [ Reduction:% ti	] Yes 🔀 N ips	0	Pass-by a Reduction	illowanc	e: 🔲 Yes 🛛 No _% trips
Software Methodology	Synchro 🗌 HCS	(v.2000/+) [	_ a	aSIDRA	CORS	IM 🗌 Other
Traffic Signal Proposed or Affected (Analysis software to be used, progression speed, cycle length)	None					

It is important for the applicant to provide sufficient information to county and VDOT staff so that questions regarding geographic scope, alternate methodology, or other issues can be answered at the scoping meeting.

Attachment 9 Page 45 of 113

Improvement(s) Assumed or to be Considered	None that would impact the study intersections
Background Traffic Studies Considered	Shelton Woods (TIA called "Woods at Augustine") Shelton Knolls
Plan Submission	Master Development Plan (MDP) Generalized Development Plan (GDP)   Preliminary/Sketch Plan Other Plan type (Final Site, Subd. Plan)
Additional Issues to be Addressed	Queuing analysisActuation/CoordinationWeaving analysisMerge analysisBike/Ped AccommodationsIntersection(s)TDM MeasuresOther Turn lane warrants

NOTES on ASSUMPTIONS: 1. Recently approved developments of Shelton Knolls and Shelton Woods will be discussed in the report but no traffic from those developments would impact the study intersections.

2. Distributions based on Shelton Knolls/Shelton Woods TIAs and assume 90% of traffic is oriented towards I-95.

3. As agreed upon at the scoping meeting, background traffic growth assumed at 2.5% which accounts for all other developments in the study area.

4. Courthouse Road/Winding Creek Road/Realigned Ramoth Church Road to be discussed in the report but not analyzed.

SIGNED:

Applicant or Consultant

PRINT NAME: <u>Carlos G. Garcia, PE</u>

Applicant or Consultant

Administrative Guidelines

April 2013

## SCOPE OF WORK MEETING CONCLUSIONS ADDITIONS TO THE VDOT REQUIRED ELEMENTS, CHANGES TO THE METHODOLOGY OR STANDARD ASSUMPTIONS, AND SIGNATURE PAGE

Any additions to the VDOT Required Elements or changes to the Methodology or Standard Assumptions due to special circumstances that are approved by VDOT:

- Reference to the future extension of Embray Mill Rook as contained within Embray Mill Subfivision proffers.
The applicant will contact VDOT and the locality prior to the preparation of the traffic impact analysis study in the event there are any substantial changes in the existing conditions that will
AGREED:Applicant or Consultant DATE: DATE:
PRINT NAME: <u>Corlos G. Gorcio</u> Applicant or Consultant SIGNED: <u>VDOT Řepresentative</u> DATE: <u>8/16/16</u>
PRINT NAME:
SIGNED: Charles J. Hear DATE: 8/17/16 Local Government Representative
PRINT NAME: Charles J. Hess Local Government Representative



Attachment 9 Page 48 of 113

# APPENDIX B RAW TRAFFIC DATA



Project: Musselman Counted By: Ed Tatum Weather:

Bowman Consulting

3951 Westerre Parkway, Suite 150 Richmond, Virginia 23233 804.616.3240

File Name : Eustace and Live Oak AN Site Code : 00000001 Start Date : 4/4/2014 Page No : 1

		nt. Total	75	2	108	142	205	530		145	77	: [	10	66	378		908			000	000	100	0	
		. Total	20	200	33	22	24	109		10	15		N	17	54		163		18	162	200	001	0	•
		eds App		0	D	Q	ى ى	ъ С		0	0	• •	5	0	0	I	5	 	0.6	L.		3	0	•
ak Lane		eff			01	16	8	45		4	10	, c	<b>°</b> (	D,	26	i	5	9.0	8.	1		3	0	•
Live O	5	Ę	  c	0 0	5	0	0	0	0	0	-	c	5 0	0	-	,	-	.6	.1	-	. 6	3	0	,
	Ĩ		10	2 6	S	9	11	59	c	٥	4	0		x	27	2	۔ م	ω.	5	98		2	0	(
					2	4	ញ	90	-	0	9	0	1 9	2	4		~ ; >	52	5	0			C	0
	1	App. To:		1.0	., .			50	г		~	0	1 -	च	16	ſ	5		40	37	10	2		
oad		reds	0	C	5 1	Ω I	-	12	•	4. 1	0	C	) C	2	4		2 ;	4.5	<b>.</b> 8	16	100	8	C	•
Istace R	401	Len	4	Ľ	1 0	- 1	m	19	ç	о (	N	c		Ŧ	თ	00	0 C	0.	3.1	28	100	2		c
шш	The	ח	5	21		40	69	152	67	5 8	23	22	36	3	148	006		0.10	33	300	100		· د	
	Diah4	lin	2	G	*	- 1	4	23	~	1 -	-	0	C		n	26	, r	- 0	5.9	26	100		2	
	n Total	ipin . di	*	-	• •	- 0	ימ		σ	1 (	1	4	Þ		24	35	3	0	3.9	35	100	c	0	
8	eds Ar	ζ γγ	-	-		> <	5	۷	С	о ц	۰ n	4	~			13	2.72		+.+	13	100	c		
l Entran m East	left F		0	0	C	, c	, ,	o	<del>د</del>	•	- ,	0	-		n	9	171			g	100	c	0 0	
Schoo	hru		0	0	c	> c		>	0		2 0	Ð	0		>	0	è	• c	5	0	0	c	• c	
	iaht		Ç	0	c	o u	2 4	2	œ	~	- c	þ	-	10	2	16	15.7	α,	0.0	9	100	0		
	Total	1	2	42	56		200	5	50	29		מ	38	126	202	340	7	7 4		040	100	0	C	
	S App.		~ •	~	_				~	_		_	~			_	_	°.						
orth	Ped			<u> </u>				•	U				0		,	0	0							,
rom No	Left	ſ	4	4	1	14	31	,	-	0	) <del>.</del>		0	0	1	33	9.7	3.6	200	3	3	0	C	>
IJ Ľ	Thru		- L - c	35	39	70	155		47	23	46	2 (	36	122	1	277	81.5	30.5	770	1 1 7	3	0	C	,
	Right	A	r c	r	9	S	18	2	2	9	c	11	2	12	!	30	8.8	3.3	30	5	3	0	c	•
	start Time	07-00 AM	07:15 AM	MIN CI	07:30 AM	07:45 AM	Total		08:00 AM	08:15 AM	08-30 AM		U8:45 AM	Total		Grand Total	Apprch %	Total %	Inchifted	0/. I Inchifted		Bank 1	% Bank 1	

## Attachment 9 Page 49 of 113

Bowman Consulting 3951 Westerre Parkway, Suite 150 Richmond, Virginia 23233 804.616.3240

Counted By: Ed Tatum Weather:

Project: Musselman

File Name : Eustace and Live Oak AM Site Code : 00000001 Start Date : 4/4/2014 Page No : 2

		1				-															
		ш́ "	Istace R	th			Sci	iool Enti From Ea	rance st			Sun H	stace Ro	h			Live	oak La	a +		
												: -						COAL HIO	-		10
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analy.	sis From	07:00 AN	A to 08-4	5 AM - P	eak 1 of 1												-				
Peak Hour for En	ntire Inters	ection B	edins at t	07:15 AN	1																
07:15 AM	e	35	4	0	42	0	C	C	-	-	u S	54	u	c	00	ç	c		C		
07-30 014	4	00	* *	c	0		•			- (		4	2	2	70	C7	0	0	0	33	108
		2	-	2	00		C	P	0	0	11	41	2	S	64	9	0	16	c	22	142
U/:45 AM	2	70	14	0	89	9	0	n	0	σ	4	69	6	7	20	* *				12	
08:00 AM	2	47		C	50	00	c	-		C	· c	5.7	) (	. •	36	- (	2 1	0 .	Ċ (	74	CU2
Total Volume	16	101	00		200			-			2	10	0	4	9/	٥	Э	4	0	10	145
	2 0	121			107	4	D	4	-	61	23	198	18	16	255	46	0	38	ŋ	68	900
% App. 10tal	Ø.0	80.6	12.7	0		73.7	0	21.1	5.3		o	77.6	7.1	63		517	c	10.7	3	)	
PHF	.667	.682	.536	000	666	438	000	333	250	520	503	747	643	574	000			17.1	0.0		
							????	222	224	242.	540.		040.	1.10.	00/.	200	000.	594	.250	6/4	737

Attachment 9 Page 50 of 113

Project: Musselman Counted By: Ed Tatum Weather:

Bowman Consulting

3951 Westerre Parkway, Suite 150 Richmond, Virginia 23233 804.616.3240

File Name : Eustace and Live Oak PN Site Code : 00000001 Start Date : 4/2/2014 Page No : 1

			Tetel		111	120	120	151	502		140	200	176	106	62B	070	1120	1130			1130	100		) C
			And Takel	App. 10tal	1	21	23	ŋ	56	ç	5	17	16	74		8	110	011	0	10.3	116	100		
	ne	+	0040		0	ო	-	<b>4</b>	S	•	-	0	-			2	0	00	ח ת ס כ	\.n	ø	100		) C
	Oak La	om Wes	401		n,	14	13		31	¢	0	œ	თ	ų G	3.5	5	53		1 u 0 u	0.0	62	100	c	) C
	Live	Ľ	The			0	0	0	0	c	0	0	0	C		•	c	> c	<b>,</b>	-	0	0	c	0
			Rinht	TINGIN I	4	4	ი	ო	20	~	<b>t</b> (	D	g	7	26	)	46	20 4		+	46	100	c	0
			n Total	1000 · · ·	4 .	44	34	60	185	101	1 0	20	67	34	211		306	200	35	200	396	100	0	0
			eds An		<del>1</del> .	4	4	2	19	÷	- 0	N	2	4	6		28	 	- u - c	2.2	87	100	0	0
	Ice Roa	n South	l eft	. (4	0 1	_	9	9	29	t- t-		α	ω	9	33		62	15.7	. u	2.0	20	100	0	0
nk 1	Eusta	Fron	[hn]	27	5	3:	24	4	131	28		0	57	24	164		295	245	5 1 2 1	- 100	CRZ	100	0	0
ted - Ba			tiaht -		<b>&gt;</b> (	יט	Ð	m	9	~	1 0	0	0	0	2		11	28	) <del>-</del>	-	_	100	0	0
Unshif	_		otal	40	2 0	2		12	42	6	, <u>*</u>	= :	12	œ	40	•	82		5.3	2 6	70	8	0	0
Printed-			ADD. To		_							_							1-			-		
Sroups F	trance	ast	Peds		- c				16	9		2 (	Ð		27		43	52.4	60		1	100	0	0
0	nool En	From E	Left	-		1 (	יט	ן מ	11	2	10	10	Ċ,	1	œ		25	30.5	2.2	40	2.4	6	0	0
	Sch		Thru	C		0 0		o e	Э	0		0 0	C	0	0		0	0	C		2	0	0	0
			Right	~	1 6	י נ	40	20	D)	~	~ ~	•	-	0	S		14	17.1	1.2	44	+ 0	200	0	0
			Vpp. Total	47	46	f		14	513	82	104	5 3	0	20	317		536		47.4	536		100	0	0
	ad	_	Peds /	0			<b>&gt;</b> <		þ	0	C	0 0	0	0	0		0	0	0	c		-	0	0
	tace Ro	mont Mont	Left	-	C	) <del>~</del>	- ເ	n u	n	4	÷	- (J	0 (	2	13		18	3.4	1.6	18		2	0	0
	Eus	2 Z	Thru	36	36	38.0	2 4	100	201	63	84		2	51	231		394	73.5	34.9	394		3	0	0
			Right	9	10	ς Γ	2 4		5	15	19	50	11		73		124	23.1	1	124		3	0	0
			Start Time	04:00 PM	04:15 PM	04-30 PM	04-45 PM	Total	IDIO I	05:00 PM	05:15 PM	05-30 DM		MH C4:CO	Total	2	Grand Total	Apprch %	Total %	Unshifted	0/ Ilachiftad		Bank 1	% Bank 1

Attachment 9 Page 51 of 113 Bowman Consulting 3951 Westerre Parkway, Suite 150 Richmond, Virginia 23233 804.616.3240

Counted By: Ed Tatum Project: Musselman

Weather:

File Name : Eustace and Live Oak PM Site Code : 00000001 Start Date : 4/2/2014 Page No : 2

		<u>س</u> ۳	Instace R	rth			Sch	iool Entr <sup>-</sup> rom Ea:	ance st			ű ű	stace Ro	oad th			ů Č	e Oak La	ane		
Start Time	Right	Thn	eft	Pede	Ann Total		The	401	op-od			-		-			:  -   i				
	0	3		222	יקקע	THRM				App. 1 otal	Ngm		τеπ	reds	App. Total	Kight	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analy	<b>'sis From</b>	04:00 PN	VI to 05:4	5 PM - P	eak 1 of 1																
Peak Hour for Er	ntire Inter-	section B	egins at	04:45 PN	V																
04:45 PM	16	55	ۍ ۱	0	74	2	0	3	7	12	~	40	0	-	SO 1	~	c	*		L	i,
05:00 PM	15	63	4	0	82	+-	C		. C	jo		β	2 7		3	<del>،</del> د		- c		n ç	LCL
05:15 PM	19	84	-	0	104		o c	10	<u>ی</u> د	, <del>,</del>	4 6	ם ע ע ע	- °	- c	7 5	4 0	-	οo	- (	51	146
05:30 PM	2	53	9	0	81	-		1 (1	α	- 5	о с	36	0 0	N 0	8	50 (	-	20 (	э ·	11	200
Total Volume	64	255	14		244	-				4		10		Z	10	٥	Э	5	-	16	176
	2		<u>t</u> ,		+		Þ	2	17	44	×	180	37	12	237	22	0	26	ო	51	673
76 App. 10tal	L.12	/4.8	4.1	0		15.9	0	22.7	61.4		3.4	75.9	15.6	5.1		43.1	c	5	5		)
HH	.818	.759	.583	000	.820	.583	000	.833	.844	917	667	789	R41	479	871	611		700	750	750	044
													-		- 		222	771.	nc/.		74X

Attachment 9 Page 52 of 113

# **APPENDIX C**

# **PROJECTED 2016 PEAK HOUR ANALYSIS WORKSHEETS**



3.3

### Intersection

Int Delay, s/veh

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	84	12	76	141	22	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	80	55	69	67	58	82
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	105	22	110	210	38	76

Major/Minor	Minor1		Major1		Major2		
Conflicting Flow All	366	215	0	0	321	0	
Stage 1	215	-	-	-	-	-	
Stage 2	151	-	-	-	-	-	
Critical Hdwy	6.42	6.22	-	-	4.12	-	
Critical Hdwy Stg 1	5.42	-	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	-	
Follow-up Hdwy	3.518	3.318	-	-	2.218	-	
Pot Cap-1 Maneuver	634	825	-	-	1239	-	
Stage 1	821	-	-	-	-	-	
Stage 2	877	-	-	-	-	-	
Platoon blocked, %			-	-		-	
Mov Cap-1 Maneuver	614	825	-	-	1239	-	
Mov Cap-2 Maneuver	614	-	-	-	-	-	
Stage 1	821	-	-	-	-	-	
Stage 2	849	-	-	-	-	-	

Approach	WB	NB	SB	
HCM Control Delay, s	12	0	2.7	
HCM LOS	В			

Minor Lane/Major Mvmt	NBT	NBRW	/BLn1	SBL	SBT	
Capacity (veh/h)	-	-	642	1239	-	
HCM Lane V/C Ratio	-	-	0.198	0.031	-	
HCM Control Delay (s)	-	-	12	8	0	
HCM Lane LOS	-	-	В	А	А	
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-	

4.8

### Intersection

Int Delay, s/veh

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	109	28	98	102	19	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	65	84	73	71	64	66
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	168	33	134	144	30	80

Major/Minor	Minor1		Major1		Major2		
Conflicting Flow All	346	206	0	0	278	0	
Stage 1	206	-	-	-	-	-	
Stage 2	140	-	-	-	-	-	
Critical Hdwy	6.42	6.22	-	-	4.12	-	
Critical Hdwy Stg 1	5.42	-	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	-	
Follow-up Hdwy	3.518	3.318	-	-	2.218	-	
Pot Cap-1 Maneuver	651	835	-	-	1285	-	
Stage 1	829	-	-	-	-	-	
Stage 2	887	-	-	-	-	-	
Platoon blocked, %			-	-		-	
Mov Cap-1 Maneuver	635	835	-	-	1285	-	
Mov Cap-2 Maneuver	635	-	-	-	-	-	
Stage 1	829	-	-	-	-	-	
Stage 2	866	-	-	-	-	-	

Approach	WB	NB	SB	
HCM Control Delay, s	12.8	0	2.1	
HCM LOS	В			

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT	
Capacity (veh/h)	-	- 661	1285	-	
HCM Lane V/C Ratio	-	- 0.304	0.023	-	
HCM Control Delay (s)	-	- 12.8	7.9	0	
HCM Lane LOS	-	- B	А	А	
HCM 95th %tile Q(veh)	-	- 1.3	0.1	-	

5

### Intersection

Int Delay, s/veh

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	40	0	48	4	0	15	19	208	24	30	191	16
Conflicting Peds, #/hr	5	0	21	17	0	1	21	0	17	1	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	59	92	50	33	92	44	64	72	52	54	68	67
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	68	0	96	12	0	34	30	289	46	56	281	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	830	836	335	861	825	334	326	0	0	352	0	0
Stage 1	425	425	-	388	388	-	-	-	-	-	-	-
Stage 2	405	411	-	473	437	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	289	303	707	276	308	708	1234	-	-	1207	-	-
Stage 1	607	586	-	636	609	-	-	-	-	-	-	-
Stage 2	622	595	-	572	579	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	251	268	682	215	273	695	1212	-	-	1202	-	-
Mov Cap-2 Maneuver	251	268	-	215	273	-	-	-	-	-	-	-
Stage 1	578	544	-	608	582	-	-	-	-	-	-	-
Stage 2	571	568	-	456	537	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.2	14.2	0.7	1.3
HCM LOS	С	В		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1\	WBLn1	SBL	SBT	SBR	
Capacity (veh/h)	1212	-	-	399	438	1202	-	-	
HCM Lane V/C Ratio	0.024	-	-	0.411	0.106	0.046	-	-	
HCM Control Delay (s)	8	0	-	20.2	14.2	8.1	0	-	
HCM Lane LOS	А	А	-	С	В	А	А	-	
HCM 95th %tile Q(veh)	0.1	-	-	2	0.4	0.1	-	-	

2.7

### Intersection

Int Delay, s/veh

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	27	0	23	11	0	7	39	189	8	15	268	76
Conflicting Peds, #/hr	3	0	15	39	0	27	15	0	39	27	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	100	61	83	92	58	84	79	67	58	76	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	0	38	13	0	12	46	239	12	26	353	93

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	849	849	453	862	889	311	460	0	0	290	0	0
Stage 1	466	466	-	377	377	-	-	-	-	-	-	-
Stage 2	383	383	-	485	512	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	281	298	607	275	282	729	1101	-	-	1272	-	-
Stage 1	577	562	-	644	616	-	-	-	-	-	-	-
Stage 2	640	612	-	563	536	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	251	263	580	227	249	689	1065	-	-	1243	-	-
Mov Cap-2 Maneuver	251	263	-	227	249	-	-	-	-	-	-	-
Stage 1	541	539	-	592	566	-	-	-	-	-	-	-
Stage 2	584	563	-	495	514	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18	16.7	1.3	0.4
HCM LOS	С	С		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1\	NBLn1	SBL	SBT	SBR	
Capacity (veh/h)	1065	-	-	351	334	1243	-	-	
HCM Lane V/C Ratio	0.044	-	-	0.214	0.076	0.021	-	-	
HCM Control Delay (s)	8.5	0	-	18	16.7	8	0	-	
HCM Lane LOS	А	А	-	С	С	А	А	-	
HCM 95th %tile Q(veh)	0.1	-	-	0.8	0.2	0.1	-	-	

6/9/2016

Attachment 9 Page 58 of 113

## HCM Unsignalized Intersection Capacity Analysis 5: Eustace Road & Hampton Park Road/Northampton Blvd

	≯	-	$\mathbf{r}$	1	-	•	1	1	1	1	Ŧ	-
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	ef 🔰		٦	ef 👘			र्च	1	٦	ef 👘	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	92	141	4	34	109	57	2	129	42	42	57	28
Peak Hour Factor	0.77	0.78	0.33	0.61	0.68	0.79	0.50	0.83	0.75	0.81	0.65	0.70
Hourly flow rate (vph)	119	181	12	56	160	72	4	155	56	52	88	40
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2				
Volume Total (vph)	119	193	56	232	159	56	52	128				
Volume Left (vph)	119	0	56	0	4	0	52	0				
Volume Right (vph)	0	12	0	72	0	56	0	40				
Hadj (s)	0.53	-0.01	0.53	-0.18	0.05	-0.67	0.53	-0.19				
Departure Headway (s)	6.6	6.0	6.6	5.9	6.4	5.7	7.0	6.3				
Degree Utilization, x	0.22	0.32	0.10	0.38	0.29	0.09	0.10	0.22				
Capacity (veh/h)	519	568	515	581	525	581	479	535				
Control Delay (s)	10.2	10.7	9.2	11.3	10.8	8.1	9.6	9.9				
Approach Delay (s)	10.5		10.9		10.1		9.8					
Approach LOS	В		В		В		А					
Intersection Summary												
Delay			10.4									
Level of Service			В									
Intersection Capacity Utilization	on		39.2%	IC	CU Level o	of Service			А			
Analysis Period (min)			15									

## HCM Unsignalized Intersection Capacity Analysis 5: Eustace Road & Hampton Park Road/Northampton Blvd

5: Eustace Road &	Hampto	on Par	k Road	d/North	nampto	on Blvd					6/1	0/2016
	٦	+	*	4	Ļ	•	•	Ť	*	*	Ļ	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	el 🗍		ľ	eî 🗧			÷٩	1	ľ	el 🕴	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	41	193	7	45	305	93	5	67	40	103	121	65
Peak Hour Factor	0.70	0.87	0.58	0.72	0.77	0.74	0.42	0.80	0.68	0.88	0.80	0.86
Hourly flow rate (vph)	59	222	12	62	396	126	12	84	59	117	151	76
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2				
Volume Total (vph)	59	234	63	522	96	59	117	227				
Volume Left (vph)	59	0	63	0	12	0	117	0				
Volume Right (vph)	0	12	0	126	0	59	0	76				
Hadj (s)	0.53	0.00	0.53	-0.13	0.10	-0.67	0.53	-0.20				
Departure Headway (s)	7.6	7.1	7.2	6.5	7.8	7.1	7.9	7.1				
Degree Utilization, x	0.12	0.46	0.12	0.94	0.21	0.12	0.26	0.45				
Capacity (veh/h)	452	490	485	549	438	480	441	488				
Control Delay (s)	10.5	14.8	10.0	49.4	11.7	9.8	12.3	14.6				
Approach Delay (s)	13.9		45.2		11.0		13.9					
Approach LOS	В		E		В		В					
Intersection Summary												
Delay			26.8									
Level of Service			D									
Intersection Capacity Utiliza	ation		47.4%	IC	CU Level o	of Service			А			
Analysis Period (min)			15									

## Intersection: 3: Winding Creek Road & Embrey Mill Road

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	65	31
Average Queue (ft)	39	6
95th Queue (ft)	66	26
Link Distance (ft)	2103	3012
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

## Intersection: 4: Eustace Road & Live Oak Lane/Middle School Ent.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	53	28	26	86
Average Queue (ft)	40	11	5	17
95th Queue (ft)	57	33	23	74
Link Distance (ft)	2047	169	2338	3516
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

## Intersection: 5: Eustace Road & Hampton Park Road/Northampton Blvd

Movement	EB	EB	WB	WB	NB	NB	SB	SB	
Directions Served	L	TR	L	TR	LT	R	L	TR	
Maximum Queue (ft)	64	68	24	89	50	51	27	52	
Average Queue (ft)	44	42	17	48	40	22	16	42	
95th Queue (ft)	67	69	33	93	60	54	37	59	
Link Distance (ft)		1559		1206	617			912	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	150		340			200	250		
Storage Blk Time (%)									
Queuing Penalty (veh)									

6/9/2016

## Intersection: 3: Winding Creek Road & Embrey Mill Road

Movement	WB
Directions Served	LR
Maximum Queue (ft)	45
Average Queue (ft)	30
95th Queue (ft)	50
Link Distance (ft)	2103
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

## Intersection: 4: Eustace Road & Live Oak Lane/Middle School Ent.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	31	28	50	49
Average Queue (ft)	12	16	16	28
95th Queue (ft)	37	38	49	58
Link Distance (ft)	2047	169	2338	3516
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

## Intersection: 5: Eustace Road & Hampton Park Road/Northampton Blvd

Movement	EB	EB	WB	WB	NB	NB	SB	SB	
Directions Served	L	TR	L	TR	LT	R	L	TR	
Maximum Queue (ft)	49	69	24	256	25	29	69	82	
Average Queue (ft)	25	55	24	157	20	22	44	50	
95th Queue (ft)	51	73	25	286	36	40	71	92	
Link Distance (ft)		1559		1206	617			912	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	150		340			200	250		
Storage Blk Time (%)									
Queuing Penalty (veh)									

# APPENDIX D

# OTHER DEVELOPMENT TRAFFIC ASSIGNMENTS



Attachment 9 Page 63 of 113



Attachment 9 Page 64 of 113



Attachment 9 Page 65 of 113

## **APPENDIX E**

**HISTORIC VDOT TRAFFIC COUNTS** 



		AADT by Year											
Link	From/To	2007	2008	2009	2010	2011	2012						
Winding Creek	Embrey Mill to Courthouse	4,500	4,500	4,500	4,500	4,500	3,900						
Courthouse	Shelton Shop to I-95	12,000	13,000	10,000	10,000	10,000	12,000						
Embrey Mill	Winding Creek to End	3,200	3,200	3,200	3,200	3,200	2,400						
Eustace	Embrey Mill to Eustace	3,700	3,700	3,700	3,700	3,700	3,000						

## Table E.1 Historic Traffic Growth Rates

Link	From/To	1 Year Growth Rate (2011- 2012)	2 Year Growth Rate (20010- 2012)	3 Year Growth Rate (2009- 2012)	4 Year Growth Rate (2008- 2012)	5 Year Growth Rate (2007- 2012)
Winding Creek	Embrey Mill to Courthouse	-13.3%	-6.9%	-4.7%	-3.5%	-2.8%
Courthouse	Shelton Shop to I-95	20.0%	0.0%	6.3%	-2.0%	0.0%
Embrey Mill	Winding Creek to End	-25.0%	0.0%	-9.1%	-6.9%	-5.6%
Eustace	Embrey Mill to Eustace	-18.9%	0.0%	-6.8%	-5.1%	-4.1%
Average Rate by	Year	-9.3%	-1.7%	-3.6%	-4.4%	-3.1%

Annual Growth Rate to be used in Study: 2.5%

### Virginia Department of Transportation Traffic Engineering Division 2007 Annual Average Daily Traffic Volume Estimates By Section of Route Stafford Maintenance Area

Route	Length	AADT	QA	4Tire	Bus	2Axle	Tn 3+Axle	ıck 1Trail	2Trail	QC	K Factor	QK	Dir Factor	AAWDT	QW	Year
Statiord County	<u> </u>	From			1	US 1 S, Jef	ferson Dav	is Hwy								
(627) Forbes St	2.08	6100	G	99%	0%	1%	0%	0%	0%	С	0.114	F	0.598	6500	G	2007
<u> </u>		From	0' 11		8	89-624 Mort	ton Rd; Lay	/hill Rd								
627 Mountain View Rd	0.75	6200	G	99%	0%	1%	0%	0%	0%	F	0.108	F	0.72	6300	G	2007
627 Mountain View Rd	2.57	3800	G	99%	0%	1%	9-8900 0%	0%	0%	F	0.115	F	0.595	3900	G	2007
627 Mountain View Rd	2.27	5200 <sup>Free</sup>	G	99%	0%	89-651 K 1%	ellogg Mil 0%	0%	0%	F	0.106	F	0.606	5300	G	2007
627 Mountain View Rd	2.54	3600 <sup>Trom</sup>	G	99%	0%	89-648 N. 1 1%	Shelton Sh 0%	op Rd 0%	0%	F	0.125	F	0.529	3600	G	2007
627 Mountain View Rd	1.76	3500 To	G	99%	0%	89-643 1%	3 Joshua R 0%	1 0%	0%	F	0.122	F	0.547	3500	G	2007
		Fmm	1			89-01	o Popiar Ki	1								
628 Winding Creek Rd	0.14	2300	R			89-048 51	ieiton Shoj	o Ka						NA		09/15/2003
628 Winding Creek Rd	0.13	2300 Fmm	R			89-1282 (	Glenwood	Ave			NA			NA		09/15/2003
628 Winding Creek Rd	0.49	2300	R			89-1284	Oaklawn	۲d			NA			NA		09/15/2003
628 Winding Creek Rd	0.56	2200	R			89-709	Flatford R	d			NA			NA		09/15/2003
628 Winding Creek Rd	0.60	4500	R			89-733 E1	mbrey Mill	Rd						NA		09/15/2003
(628) Ramoth Church Rd	1.76	2400	G	97%	0%	89-630 E, 89-630 W, <b>1%</b>	Courthous Courthous 1%	e Rd e Rd 1%	0%	F	0.119	F	0.720	2500	G	2007
	0.40	From		070/	8	9-651 Acco	keek Furn	ice Rd	0.04	_	<u> </u>					
(628) Ramoin Church Rd	3.10	1600 	G	97%	0%	1% US I Jeffer	1% son Davis	1% Hwy	0%	F	0.107	+	0.515	1600	G	2007
628 Eskimo Hill Rd	1.77	3600	G	97%	0%	1%	1%	1%	0%	F	0.1	F	0.616	3700	G	2007
628 Eskimo Hill Rd	1.20	From: 1600 To:	G	97%	0%	1% 89-608	1% Brooke Ro	1%	0%	С	0.109	F	0.688	1600	G	2007
		From				89-630 C	ourthouse	Rd								
629 Andrew Chapel Rd	0.89	3300 Te:	G	98%	1%	1%	0% Brooke Ro	0%	0%	С	0.12	F	0.513	3400	G	2007
		From				89-648 Sh	elton Shon	84			-					
630 Courthouse Rd	4.00	12000 Tech	G	96%	1%	1%	2%	1%	0%	F	0.112	F	0.663	12000	G	2007
630 Courthouse Rd	0.86	16000	G	94%	1%	Ramp 1%	2%	1%	0%	С	0.090	F	0.583	17000	G	2007
630 Courthouse Rd	0.93	8400	G	96%	1%	US I Jeffer 1%	son Davis 2%	Hwy 1%	0%	F	0.125	F	0.614	8600	G	2007
630 Courthouse Rd	1.70	From 1	G	96%	1%	89-134 1%	5; 89-1557 2%	1%	0%	С	0.098	F	0.532	4800	G	2007
630 Courthouse Rd	0.95	т From: 680	R			89-629 And	lrew Chape	l Rd			NA			NA		09/24/2003
Gan Courthouse Rd	0.65	To: From: 310	R			89-666 Aq	uia Creek	Rd						NA		09/24/2003
		Tr:				Dea	ad End									
		From			U	S 1 S, Jeffe	rson Davis	Hwy								
631) Bells Hill Rd	0.12	2200 Tr. I	R			00 134	70-6-0				NA			NA		09/29/2003
						07-130	n Uak DI				1					

.

.....

#### Virginia Department of Transportation Traffic Engineering Division 2008 Annual Average Daily Traffic Volume Estimates By Section of Route Stafford Maintenance Area

							- •											
	Staff	Route	Length	AADT	QA	4Tire	Bus	2Axle	Tru 3+Axle	ick 1Trail	2Trail	QC	K Factor	QK	Dir Factor	AAWDT	QW	Year
	Statte			From			ι	US I S, Jeff	ferson Dav	s Hwy								
	(627)	Forbes St	2.08	6400	G	99%	0%	1%	0%	0%	0%	С	0.114	F	0.598	6900	G	2008
	$\leq$			Ta			- 8	9-624 Mort	on Rd; Lay	hill Rd								
	627	Mountain View Rd	0.75	6600	G	99%	0%	1%	0%	0%	0%	F	0.108	F	0.72	6700	G	2008
	627	Mountain View Rd	2.57	3900 From	G	99%	0%	1%	9-8900 0%	0%	0%	F	0.115	F	0.595	3900	G	2008
	627	Mountain View Rd	2.27	5300 <sup>From</sup>	G	99%	0%	89-651 K	ellogg Mill 0%	0%	0%	F	0.106	F	0.606	5400	G	2008
	627	Mountain View Rd	2.54	3800 From	G	99%	0%	<u>89-648 N, S</u> 1%	0%	0%	0%	F	0.125	F	0.529	3900	G	2008
	627	Mountain View Rd	1.76	3500 From To	G	99%	0%	89-643 1% 89-616	0% O%	0%	0%	F	0.122	F	0.547	3600	G	2008
				From				90 649 Sh	alton Shor	Dd								
	628	Winding Creek Rd	0.14	2300	R			80, 1282 (	Plannard	Nu						NA		09/15/2003
	628	Winding Creek Rd	0.13	2300 From	R			. 89-1282 (	Jenwood	Ave			NA			NA		09/15/2003
	628	Winding Creek Rd	0.49	2300	R			89-1284	Oaklawn I				NA			NA		09/15/2003
	628	Winding Creek Rd	0.56	5 Emm	R			89-709	Flatford R	1			NA			NA		09/15/2003
>	628	Winding Creek Rd	0.60	4500 To:	R			89-733 Er	nbrey Mill	Rd						NA		09/15/2003
	628)	Ramoth Church Rd	1.76	2500	G	97%	0%	89-630 E, 0 89-630 W, 1%	Courthouse Courthous 1%	Rd Rd 1%	0%	F	0.119	F	0.720	2500	G	2008
	0			Ta				9-651 Accol	keek Furns	ce Rd								
	628	Ramoth Church Rd	3.10	1600 To	F	97%	1%	1%	1%	0%	0%	С	0.109	F	0.579	1700	F	2008
	628	Eskimo Hill Rd	1.77	3800 To:	G	97%	0%	1%	1%	1%	0%	F	0.1	F	0.616	3900	G	2008
	628	Eskimo Hill Rd	1.20	From: 1600 То	G	97%	0%	1% 89-608	1% Brooke Ro	1%	0%	С	0.109	F	0.688	1600	G	2008
				From.	_			89-630 C	ourthouse l	۲d			1					
	629	Andrew Chapel Rd	0.89	3400 ™	G	98%	1%	1% 89-608	0% Brooke Rd	0%	0%	С	0.12	F	0.513	3500	G	2008
•	_			From				89-648 She	elton Shop	Rd								
1	(630)	Courthouse Rd	4.00	13000	G	96%	1%	1%	2%	1%	0%	F	0.112	F	0.663	13000	G	2008
<u></u> .	$\frac{\circ}{\circ}$			To From				Ramp	from I-95				]					
	(630)	Courthouse Rd	0.86	17000	G	94%	1%	1%	2%	1%	0%	С	0.090	F	0.583	18000	G	2008
•	0			To: From.			τ	US 1 Jeffers	son Davis l	łwy			]					
	(630)	Courthouse Rd	0.93	8500	G	96%	1%	1% 	2% 5; 89-1557	1%	0%	F	0.125	F	0.614	8700	G	2008
	630	Courthouse Rd	1.70	4900	G	96%	1%	1% 9-629 And	2% rew Chape	1% I Rd	0%	С	0.098	F	0.532	5000	G	2008
	630	Courthouse Rd	0.95	680 Tel	R			89-666 An	uia Creek	84						NA		09/24/2003
-	630	Courthouse Rd	0.65	570m:L 310 	R			Dea	nd End							NA		09/24/2003
-				From			U	S 1 S, Jeffer	rson Davis	Hwy								
	631)	Bells Hill Rd	0.12	2200 <sup>™</sup>	R			89-130	17 Oak Dr	-						NA	ł	09/29/2003

.

#### Virginia Department of Transportation Traffic Engineering Division 2009 Annual Average Daily Traffic Volume Estimates By Section of Route Stafford Maintenance Area

							amenam	ce Area								
Route	Length	AADT	QA	4Tire	Bus	2Axle	Tn 3+Axle	uck 1Trail	2Trail	QC	K Factor	QK	Dir Factor	AAWDT	QW	Year
Stafford County						_	_					_				
	0.00	Free	Ľ			US 1 S, Jef	ferson Dav	is Hwy								
(627) Fordes St	2.08	5400		99%	0%	0%	0%	0%	0%	С	0.118	F	0.645	5800	F	2009
		From				<u>89-62</u>	4 Morton R	<u>d</u>								
(627) Mountain View Rd	0.75	90	F	99%	0%	0%	0%	0%	0%	F	NA			100	F	2009
<u> </u>		Ta	4			89-8900 (	Centreport	Plan								
(627) Mountain View Rd	2.57	3900	F	99%	0%	0%	0%	0%	0%	F	0.119	F	0.574	4300	F	2009
$\underline{\frown}$		- <u>T.</u>				89-65T K	ellong Mil	Rd				-			·	2000
(627) Mountain View Rd	2.27	4700 From	F	99%	0%	0%	0%	0%	0%	F	0 111	F	0.617	5200	F	2000
						90 649 N	Shalton Sh	on D d				•	0.017	0200	•	2003
(627) Mountain View Rd	2.54	3400	F	99%	0%	0%	0%	0%	0%	F	0 123	F	0 740	3800	F	2000
		Ťa	. —			00.64	11.1 0						0.740	0000		2009
(627) Mountain View Rd	1.76	3700	F	99%	0%	<u>89-64</u>	Joshua Ro	1	0%	E	0 125	E	0.605	4400	_	0000
		To:	<u> </u>		070	89-61	6 Poplar Ro	1	0/0				0.005	4100	F	2009
		From				89-648 51	helton Shor	Rd								
(628) Winding Creek Rd	0.14	2300	R			07-048 31	ienon Sho	Ku						NA		00/15/200
		Ta	. <u> </u>			00 1000	<u></u>									09/13/200
(628) Winding Creek Rd	0.13	2300 Fmm	R			89-1282	Glenwood /	Ave						NA		00/45/200
UZO S S S S S S S S S S S S S S S S S S S														INA		09/15/200
Winding Creek Rd	0.49	2300	L		_	89-1284	Oaklawn F	ld								
	0.40	2000			_					_				NA		09/15/2003
Winding Crock Rd	0.50	Fmm				89-709	Flatford R	1							_	
628) Winding Creek Rd	0.50	2200	<u>к</u>								NA			NA		09/15/2003
A Minding Creak Rd	0.00	From.				89-733 Ei	mbrey Mill	Rd								_
(628) Winding Creek Rd	0.60	45UU 10:1	ĸ			90 (20 5	0. 4	<b>D</b> 1						NA		09/15/2003
		Fmm			-	89-630 E,	Courthouse	Rd	_	_	+					
628) Ramoth Church Rd	1.76	2400	F	97%	1%	1%	0%	0%	0%	F	0.116	F	0.716	2600	F	2009
<u> </u>		ta:			8	9-651 Acco	keek Furna	ce Rd	_							
628) Ramoth Church Rd	3.10	1800	F	97%	1%	1%	1%	0%	0%	С	0.093	F	0.539	1900	F	2009
<u> </u>		Tai				LIS 1 Laffar	ron Davia I				_	-		1000	•	2000
628 Eskimo Hill Rd	1.77	3200	F	97%	1%	1%	0%	0%	0%	F	0 161	F	0 732	3400	F	2000
		ta				00 (30 0				<u> </u>	_	•	0.752	5400	ſ	2009
Eskimo Hill Rd	1.20	1600 From L	F	97%	1%	1%	0%	0%	0%	0	0 221	_	0 905	4700		0000
020		1.			- 70	89-608	Brooke Rd	070	078	0	7	Г	0.005	1700	F	2009
		From:				89-630 C	ourthouse B	d							_	
(629) Andrew Chapel Rd	0.89	4100	F	98%	1%	1%	0%	0%	0%	С	0.119	F	0.514	4400	F	2009
<u> </u>		To:				89-608	Brooke Rd				7				•	2000
-		Fmm				89-648 She	elton Shop	Rd			T				_	
630) Courthouse Rd	4.00	10000	F	99%	0%	1%	0%	0%	0%	F	0.107	F	0.615	11000	F	2009
<u> </u>		Tai		-		Ramp	from 1-95	_								
630 Courthouse Rd	0.86	16000	F	96%	1%	1%	1%	1%	0%	С	0.083	F	0.552	17000	F	2009
<u> </u>			-			IS 1 Jeffer	on Davis L	luni				·				
630 Courthouse Rd	0.93	7700	F	99%	0%	1%	0%	0%	0%	F	0 129	F	0 554	8300	F	2000
		To	_			00 124	00.1007			·			0.004	0000	'	2003
Gan Courthouse Rd	1.70	5200	F	99%	0%	<u>89-1343</u> 1%	0%	0%	0%	~			0.544	5500	_	0000
0.00		·-··				170		0 /0	078			F	0.344	5500	F	2009
Courthouse Rd	0.05	From	ь			39-629 And	rew Chapel	Rd								
630) Codi tilouse i ku	0.55	000	R								NA			NA	(	09/24/2003
and Courthouse Pd	0.65	Free	-			89-666 Aq	uia Creek R	ld			<u>}</u>					
630) Cournouse Rd	0.05	310 76 F	ĸ				1 Feed	-			NA			NA	(	09/24/2003
						Dea	uend								_	
Bells Hill Rd	0 12	2200	R		U	S I S, Jeffer	son Davis l	Hwy		_		_				
	0.12	T. [		_		80 120	7 Oak De			-				NA	0	19/29/2003
						07-130										

,

### Virginia Department of Transportation Traffic Engineering Division 2010 Annual Average Daily Traffic Volume Estimates By Section of Route Stafford Maintenance Area

								an rearran to e									
	Route	Length	AADT	QA	4Tire	Bus	2Axle	Truc 3+Axle	:k 1Trail	2Trail	QC	K Factor	QK	Dir Factor	AAWDT	QW	Year
	Stafford County		From	1			89-607	Deacon Rd									<u> </u>
	626 Leeland Rd	1.55	8900 Ta	G	97%	1%	1%	1%	0%	0%	С	0.111	F	0.729	9800	G	2010
	626 Leeland Rd	0.54	1800	G	97%	1%	1%	1%	0%	0%	F	0.101	F	0.613	1900	G	2010
	626 Potomac Run Rd	2.33	1300 To	G	97%	1%	89-625 1% 89-628 Es	Leeland Rd 1% skimo Hill F	0% 8d	0%	F	0.104	F	0.661	1400	G	2010
			From			I	IS IS Jeffe	erson Davis	Hwy								
	627) Forbes St	2.08	5400 ™	G	99%	0%	0% 89-624	0% Morton Rd	0%	0%	С	0.118	F	0.645	5900	G	2010
	627 Mountain View Rd	0.75	From: 100	G	99%	0%	Cul- 0%	-de-Sac 0%	0%	0%	F				110	G	2010
	627 Mountain View Rd	2.57	3900 Fmm	G	99%	0%	89-8900 Ce 0%	entreport Pk 0%	wy 0%	0%	F	0.119	F	0.574	4300	G	2010
	627 Mountain View Rd	2.27	4800	G	99%	0%	89-651 Ke 0%	ellogg Mill F 0%	<u>84</u> 0%	0%	F	0.111	F	0.617	5300	G	2010
			Fmm			8	9-648 N, SI	helton Shop	Rd								
	(627) Mountain View Rd	2.54	3400	G	99%	0%	0% 89-643	0% Joshua Rd	0%	0%	F	0.123	F	0.740	3800	G	2010
	627 Mountain View Rd	1.76	3700 <sup>To:</sup>	G	99%	0%	0% 89-616	0% Poplar Rd	0%	0%	F	0.125	F	0.605	4100	G	2010
	628 Winding Creek Rd	0.14	Fmm: 2300	R			89-648 She	elton Shop F	Rd			NA			NA		09/15/2003
	628 Winding Creek Rd	0.13	2300	R			89-1282 G	lenwood Av	ve						NA		09/15/2003
	628 Winding Creek Rd	0.49		R			89-1284 (	Oaklawn Rd	l						NA		09/15/2003
	628 Winding Creek Rd	0.56	700 From: 2200	R			89-709 F	Flatford Rd							NA		09/15/2003
5	628 Winding Creek Rd	0.60		R			89-733 Em	ibrey Mill R	d	_					NA		09/15/2003
			From.				89-630 E, C	Courthouse I	Rd								
	628 Ramoth Church Rd	1.76	2500	G	97%	1%	1% -651 Accok	0% cek Furnace	0%	0%	F	0.116	F	0.716	2600	G	2010
	628 Ramoth Church Rd	3.10	1800	G	97%	1%	1%	1%	0%	0%	С	0.093	F	0.539	1900	G	2010
	628 Eskimo Hill Rd	1.77	3200 Trone L	G	97%	1%	1%	0%	0%	0%	F	0.161	F	0.732	3400	G	2010
	628 Eskimo Hill Rd	1.20	<sup>۶</sup> ۳۳۳ ∟ 1600 ™	G	97%	1%	1% 89-608 E	0% Brooke Rd	0%	0%	С	0.221	F	0.805	1700	G	2010
			From				89-630 Co	urthouse Rd									
	629 Andrew Chapel Rd	0.89	4200 <sup>To</sup>	G	98%	1%	1% 89-608 E	0% Brooke Rd	0%	0%	С	0.119	F	0.514	4500	G	2010
	~		From			1	89-648 Shel	lton Shop R	d								
Э.	630 Courthouse Rd	4.02		G	99%	0%	1% Ramp fi	0% (	0%	0%	F	0.107	F	0.615	11000	G	2010
	630 Courthouse Rd	0.84	16000	G	96%	1%	1%	1%	1%	0%	С	0.083	F	0.552	17000	G	2010
	630 Courthouse Rd	0.93	7800	G	99%	0%	1%	0% (	vy D%	0%	F	0.129	F	0.554	8400	G	2010
	630 Courthouse Rd	1.63	5200 To:	G	99%	0%	89-1345; 1%	; 89-1557 0% (	о% С	0%	С	0.104	F	0.544	5600	G	2010
								- or - composition	~10								

.

٠

#### Virginia Department of Transportation Traffic Engineering Division 2011 Annual Average Daily Traffic Volume Estimates By Section of Route Stafford Maintenance Area

									ica							
Rout	e	Length	AADT	QA	4Tire	Bus	 2Axie	Truck 3+Axie 1T	rail 2Trail	QC	K Factor	QK	Dir Factor	AAWDT	QW	/ Year
Statiord Co	ounty		From	-			89-60	7 Deacon Rd								
626 Leela	and Rd	1.55	8700	G	97%	1%	1%	1% 09	% 0%	С	0.111	F	0.729	9600	G	2011
626 Leela	ind Rd	0.54	1700 -	G	97%	1%	1%	1% 0%	% 0%	F	0.101	F	0.613	1800	G	2011
Poto	mac Run Rd	2 22	1200	Ľ	079/	19/	89-62	5 Leeland Rd	/ 09/			_	0.004	4.400		
626 -010		2.33	1300		9770	170	89-628 F	I 70 U7	/0 0%		0.104	-	0.661	1400	G	2011
		_	From	1		1	IS 1 S. Laf	Temon Devis Hu								
(627) Forbe	es St	2.08	5300	G	99%	0%	0%	0% 0%	<u>%</u> 0%	С	0 118	F	0 645	5800	G	2011
<u> </u>		_	To				89-624	4 Morton Rd		_					-	2011
$\frown$			From	Ļ			Cu	al-de-Sac								
(627) Mour	itain View Rd	0.75	90	G	99%	0%	0%	0% 0%	% 0%	F	NA			100	G	2011
			T., From				89-8900 C	Centreport Pkwy								
(627) Mour	itain View Rd	2.57	3800	G	99%	0%	0%	0% 0%	6 0%	F	0.119	F	0.574	4200	G	2011
			To Fmm				89-651 K	ellogg Mill Rd			<b>—</b> —					
(627) Moun	tain View Rd	2.27	4700	G	99%	0%	0%	0% 0%	6 0%	F	0.111	F	0.617	5200	G	2011
$\bigcirc$			To	<u> </u>		8	39-648 N.	Shelton Shop Rd								
(627) Moun	tain View Rd	2.54	3400	G	99%	0%	0%	0% 0%	6 0%	F	0.123	F	0.740	3700	G	2011
0			To	<u> </u>			89.64	3 Joshua Rd								
(627) Moun	tain View Rd	1.76	5000 Front	G	99%	0%	0%	0% 0%	6 0%	F	0.125	F	0.605	4000	G	2011
			Tn				89-61	6 Poplar Rd		<u> </u>		•	0.000	4000	0	2011
			From				89-648 St	helton Shop Rd		_			-			
(628) Wind	ing Creek Rd	0.14	2300	R							I NA			NA		09/15/2003
0			To				80 1292 (	Glamwood Awa								
629 Wind	ina Creek Rd	0.13	2300	R			07-1202	Oleliwood Ave						ΝΔ		00/15/2003
020	<b>J</b>		 T.(											11/1		09/13/2003
Wind	ng Creek Rd	0.40	2300 From:	P			89-1284	Oaklawn Rd						NIA		00/45/0000
020 ****	ing oreckind	0.45	2000											NA		09/15/2003
(	ng Crock Rd	0.56	DODO Francisco				89-709	Flatford Rd								
(628) WINU	ng Creek Ra	0.50	2200	ĸ							NA			NA		09/15/2003
<u> </u>			To: From:	_			89-733 Ei	mbrey Mill Rd								_
(628) Windi	ng Creek Rd	0.60	4500	R							NA			NA		09/15/2003
	-		Fmm			5	89-630 E,	Courthouse Rd			_					
628 Ramo	th Church Rd	1.76	2400	G	97%	1%	1%	0% 0%	0%	F	0.116	F	0 7 1 6	2600	G	2011
<u> </u>			To				(61 6					•	0.1 10	2000	U	2011
Ramo	th Church Rd	3 10	1800	G	97%	1%	-031 Acco 1%	1% nov	0%	<u> </u>	0.002	c	0.520	1000	_	0014
020		0.10		<u> </u>	5170	170	170	170 070		0	0.095	Г	0.559	1900	G	2011
Eskim		1 77	2400		070/	10/	JS I Jeffer	son Davis Hwy	00/			-	0.700			
628) ESKIII		1.77	3100 -	G	97%	1%	1%	0% 0%	0%	F	0.161	F	0.732	3300	G	2011
0.5.11			To: Fmm			8	89-632 Sou	them View Dr								
628 ESKIM	o Hill Rd	1.20	1600	G	97%	1%	1%	0% 0%	0%	С	0.221	F	0.805	1700	G	2011
							89-608	Brooke Rd						_		
Andro	u Chanal Rd	0.90	From:		000/	40/	89-630 C	ourthouse Rd				_			_	
(629) Allule	w Chapel Rd	0.89	4100 To:	6	98%	1%	1%	0% 0%	0%	C	0.119	F	0.514	4300	G	2011
							89-008	Brooke Kd								
Courth	ouse Rd	4 02	10000	6	0.0%		89-648 Sha 19/	elton Shop Rd	09/	-		-	0.645	44000	~	0044
	0036110	4.02		<u> </u>	3370	0 /0	1 70	0% 0%	0%	г 	0.107	F	0.015	11000	G	2011
			Fmm:				Ramp	from 1-95					_	-	_	
	iouse Ra	0.84	16000	G	96%	1%	1%	1% 1%	0%	С	0.083	F	0.552	17000	G	2011
			From:			U	IS 1 Jeffers	son Davis Hwy					_			
630) Courth	iouse Rd	0.93	7700	G	99%	0%	1%	0% 0%	0%	F	0.129	F	0.554	8200	G	2011
			Fmai				89-134	5; 89-1557			]					
(630) Courth	ouse Rd	1.63	5100	G	99%	0%	1%	0% 0%	0%	С	0.104	F	0.544	5500	G	2011
$\underline{\smile}$			Tn			89	9-629 And	rew Chapel Rd								

 $\dot{\pi}$ 

•

### Virginia Department of Transportation Traffic Engineering Division 2012 Annual Average Daily Traffic Volume Estimates By Section of Route Stafford Maintenance Area

_	_																	
_	Route		Length	AADT	QA	4Tire	Bus	2Axle	Tru 3+Axle	ck 1Trail	2Trail	QC	K Factor	QK	Dir Factor	AAWDT	QW	Year
S	tafford Cou	<u>1tv</u>		From	-1 			89-60	7 Deacon R	d			-					<u>.</u>
(	526 Leeland	d Rd	1.55	11000	F	95%	1%	1%	2%	0%	0%	С	0.113	F	0.676	12000	F	2012
(	26 Leeland	d Rd	0.54	1900 <sup>From</sup>	F	95%	1%	1%	2%	0%	0%	F	0.109	F	0.736	2000	F	2012
-			2 22	From 4500	<u>ال</u>	05%	40/	89-625	5 Leeland R	d	09/				0 779	1500		2012
(			2.33	1300		90%	170	1 70 89-628 E	≥ 70 Skimo Hill	Rd	0%	-	0.129	Г	0.770	1500	Г	2012
=				From	1		ı	JS 1 S. Jef	ferson Davi	s Hwy			<u> </u>					
6	Forbes	St	2.08	6100	F	99%	0%	1%	0%	0%	0%	С	0.128	F	0.695	6500	F	2012
_	<u> </u>		,	To				89-624	4 Morton Re	i								
6	Mounta	in View Rd	0.75	50	۳ <u>ل</u> ـــــ	00%	0%	Cu 1%	nl-de-Sac	0%	0%			c	0 501	50	F	2012
6			0.75	50	<u> </u>	3370	070	170	0/8	078	070		0.29	r	0.551	50	Г	2012
6	Mounta	in View Rd	2 57	4600 From	الے۔ F	00%	0%	89-8900 C	Centreport P	kwy 0%	0%		0 1 3 8	E	0.683	4700		2012
6			2.01	4000		3370	078	1 70	078	0 78	0 %	Г	0.130	F	0.003	4700	Г	2012
6		in View Pd	2 27	5000 Fmm	il	00%	0%	89-651 K	ellogg Mill	Rd 0%	0%		0.116	Е	0.61	6100		2012
(6			2.21	3900		9970	0%	170	0%	0%	0%	г	0.110	Г	0.01	6100	Г	2012
6		in Viau Bd	2.54	2700	<u>ل</u>	00%	0%	89-648 N, 3	Shelton She	p Rd	09/	E	0 1 2 7	E	0.792	2800	-	2010
(6	27) WOUTTa		2.04	3700		99%	0%	1%	0%	0%	0%		0.127	r	0.783	3800	F	2012
7		in Minu Dal	4.70	From	<u>ا_</u>	000/	00/	89-64	3 Joshua Rd		00/			-	0 707			
(6	Mounta	in view Ra	1.76	4300		99%	0%	1%	0%	0%	0%	F	0.122	F	0.707	4400	F	2012
=				Fmm	1			07-01		D.J.			1					
6	Winding	Creek Rd	0.14	2500	R			89-048 31	ieiton Shop	Ru						NA		09/12/2012
6	29	y oroen rie	0.11		,											1.47.4		00/12/2012
6	Winding	n Creek Rd	0.13	2600	1	_		89-1282	Jienwood A	ve						ΝΔ		00/12/2012
6	29 1111011	gorearna	0.10	2000												110		03/12/2012
6	Winding	Creek Rd	n 49	2600 From	1			89-1284	Oaklawn R	d						ΝΔ		00/12/2012
6		JOICCKIN	0.43	2000	r											1975		09/12/2012
6	Winding	Creek Rd	0.56	2100	<u>ا</u> ہے۔		_	89-709	Flatford Ro			-				NA		00/12/2012
C	28) Winding	y Oreek i tu	0.50	2100		_										11/23		09/12/2012
6	Winding	Creek Pd	0.60	2000 From	<u> </u>			89-733 Ei	mbrey Mill	Rd						NIA		00/12/2012
6			0.00	3300 Ter				89-630 E.	Courthouse	Rd						INA		09/12/2012
	_	4		From:				89-630 W,	Courthouse	Rd		_						
6	28) Ramoth	Church Rd	1.76	2900	F	97%	1%	1%	0%	0%	0%	F	0.126	F	0.788	2900	F	2012
				From			89	9-651 Acco	keek Furna	ce Rd		-						_
6	28) Ramoth	Church Rd	3.10	1900	F	97%	1%	1%	0%	0%	0%	F	0.108	F	0.758	2000	F	2012
$\sim$	<u> </u>			t. Fmm			1	US 1 Jeffei	son Davis I	łwy								
(6	28) Eskimo	Hill Rd	1.77	3000	F	97%	1%	1%	0%	0%	0%	F	0.102	F	0.613	3000	F	2012
_				To:				89-632 Sou	thern View	Dr			<b>_</b>					
(6	28) Eskimo	Hill Rd	1.20	1600	F	97%	1%	1%	0%	0%	0%	С	0.111	F	0.635	1600	F	2012
<u> </u>				Τα				89-608	Brooke Rd									
	~			From				89-630 C	ourthouse F	d								
(6:	29) Andrew	Chapel Rd	0.89	5100	F	99%	1%	1%	0%	0%	0%	C	0.116	F	0.739	5200	F	2012
_								89-608	Brooke Rd									_
6	Courtho	uso Rd	4 02	<sup>[mai</sup> ]		08%	10/	89-648 Sh	elton Shop	Rd 0%	0%	E		E	0.624	12000	E	2012
6		036110	4.02	- 1	F	30 78	1 70	1 70	0%	076	0%	Г	0.090	Г	0.034	12000	г	2012
~			0.04	Fmm		0.49/	4.07	Ramp	from I-95	00/	001			F	0.540			
6		use Ka	0.84	20000	۳	94%	1%	1%	1%	2%	0%	C	0.072	F	0.546	20000	F	2012
~			0.00	From		0001	101	US 1 Jeffer	son Davis H	lwy	00/			<b>F</b>	0.00	44000		
(6:	30 Courtino	use Ka	0.93	10000	F	98%	1%	1%	0%	0%	0%	-	0.131	F	0.69	11000	F	2012
2	20. "		4.00	From		0.051	4.0.1	89-134	5; 89-1557		00/	-		_				
(6:	30 Courtho	use Kd	1.63	5800	F	98%	1%	1%	0%	0%	0%	С	0.104	F	0.788	6200	F	2012
	-			10			8	9-629 And	irew Chapel	Kd								

4

.....

#### Virginia Department of Transportation Traffic Engineering Division 2007 Annual Average Daily Traffic Volume Estimates By Section of Route Stafford Maintenance Area

					```	Juan			1007406	u							
Route	Length	AADT	QA	4Tire	Bu	s	2Axle	T 3+Axl	ruck e 1Trai	l 2Tr	ail QC	K Facto	r QK	Dir Factor	AAWDT	QW	Year
Stafford County		From															
(727) Monroe Farm Rd	0.70	70	R				D	eau End				NA			NA		08/23/2006
		Τα				8	9-655 H	Iolly Con	ier Rd								
		From					89-611	Widewate	er Rd								
(728)	0.01	140	R									NA			NA		09/24/2003
	4.00	From					0.01 1	MN 89-6	11								0010 1/0000
(728)	1.30	100 To	ĸ				D	ead End							NA		09/24/2003
		From	-			_	89.71	7 Sussex	St								_
(730) Lake Shore Dr	0.17	110	R				07 11	- Bubberr				NA			NA		09/28/2006
<u> </u>		To	· · · · ·				89-713	Federal	Dr								
(730) Lake Shore Dr	0.30	450	R									NA			NA		09/28/2006
		To From					89-11	51 Bell F	٤d								
(730) Lake Shore Dr	0.05	380	R									NA			NA		09/28/2006
<u> </u>		To: From:						39-739									
(730) Lake Shore Dr	0.07	190	R	-				-				NA			NA		09/28/2006
<u> </u>		to From				_	89-7	37 Jay Ro	11								
(730) Lake Shore Dr	0.30	150	R									NA			NA		09/28/2006
		From:					89-731	Hampton	ı Dr								
(730) Lake Shore Dr	0.42	190	R									NA			NA		09/28/2006
		18			8	9-716	6 Kent A	ve; Gree	nwood Dr	r		_					
Hampton Dr	0.07	40					De	ad End							ΝΔ		07/08/2003
(31) Hampter Di	0.07	-10													110		07/00/2003
(721) Hampton Dr	0.08	310 From	R				89-738 (	Carroll Ci	rcle						NA		07/08/2003
	0.00	Te		•••		8	39-730 L	ake Shor	e Dr						1.07.1		01100/2000
		From					De	ad End									
(732) Cedar Lane	0.17	90	R									NA			NA		08/07/2006
<u> </u>		From					0.17 MI	N Dead E	Ind								
(732) Cedar Lane	0.18	280	R									NA			NA		08/07/2006
<u> </u>		Ta				8	9-630 C	ourthous	e Rd								
	0.60	5000	_			89-	-628 Wi	nding Cre	ek Rd:								00/40/0000
(733) Embrey Mill Rd	0.60	3200 To:	ĸ			_	De	ad End							NA		09/16/2003
		From					De	ad End				+					
(734) Eley Rd	1.00	600	R		-										NA		09/16/2003
		Ťa:				t	US 17 W	arrenton	Rd								
-		From		_			De	ad End									
(735) Wyatt Lane	0.31	280	R									NA			NA		09/25/2006
<u> </u>		To: From:					0.31 MN	N Dead E	ind							-	
(735) Wyatt Lane	0.15	630	R									NA			NA		09/25/2006
<u> </u>		To:					89-753	3 Enon R	<u>d</u>								
	0.05	Frem:					89-706	Marsh R	.d						NIA		40/07/2002
(736)	0.05	40 Te:	ĸ			τ	US 17 W	/arrenton	Rd						NA		10/07/2003
		From					De	ad End									_
(737) Jay Rd	0.08	48	R		_		De					NA			NA		10/05/2006
		Te				8	9-730 L	ake Shore	: Dr				_				
~		Fmm.		_		1	89-731 1	Hampton	Dr								
(738) Carroll Circle	0.15	160	R									NA			NA		07/08/2003
<u> </u>		Tex					Cul	-de-Sac									
	0.20	Fmm:	P			8	<u>9-730 La</u>	ake Shore	: Dr						NIA		07/00/2002
(139)	0.20	19U ™[	R				89-791	Heather	P1						NA		07700/2003

->

.

#### Virginia Department of Transportation Traffic Engineering Division 2008 Annual Average Daily Traffic Volume Estimates By Section of Route Stafford Maintenance Area

Route	Length	AADT	QA	4Tire	Bus	2Axle	Tn 3+Axle	uck 1Trail	2Trail	QC	K Factor	QK	Dir Factor	AAWDT	QW	Year
Stafford County		From	n:			D	ead End									
(727) Monroe Farm Rd	0.70	70	R								NA			NA		08/23/2006
<u> </u>		i End	<u> </u>			89-655 H	Iolly Come	r Rd			<u> </u>					
(728)	0.01	140	"L R			89-611	Widewater	Rd						NA		09/24/2003
		т				0.011	MN 80.61	1								
(728)	1.30	100 From	R			0.011	1111 02-01				NA			NA		09/24/2003
$\bigcirc$		Te	Ø.			D	ead End									
	0.47	From				89-71	7 Sussex S	t								
(730) Lake Shore Dr	0.17	110	к 								NA			NA		09/28/2006
and Lake Shore Dr	0.30	450 Fmm	: <u> </u>			89-713	3 Federal D	r						NIA		00/29/2006
(30) Lake online bi	0.00	100												INA		09/20/2000
(730) Lake Shore Dr	0.05	380 Fm	۳ <u>ـــــ</u>		-	89-11	51 Bell Ro							NA		09/28/2006
		Tr					20.730									
(730) Lake Shore Dr	0.07	190 <sup>From</sup>	R			0	59-739				NA			NA		09/28/2006
<u> </u>		To	<u>۱</u>			89-7	37 Jay Rd			-						
(730) Lake Shore Dr	0.30	150	R				or rug tta				NA			NA		09/28/2006
$\bigcirc$	<b>.</b> .	T.o				89-731	Hampton I	Dr		_	<u> </u>					
(730) Lake Shore Dr	0.42	190	R								NA			NA		09/28/2006
<u> </u>		Te	1		89-7	16 Kent A	ve; Green	wood Dr								
Hampton Dr	0.07	From	<u>ل</u>			De	ad End									07/00/0000
731) Hampton Dr	0.07	40	K.								NA			NA		07/08/2003
Hampton Dr	0.08	310				89-738 (	Carroll Cire	cle		-	NA			ΝΔ		07/08/2002
	0.00	Та	<b>N</b>			89-730 L	ake Shore	Dr			Τ̈́			110		07708/2003
		From	1			De	ad End				<u> </u>					
732) Cedar Lane	0.17	90	R								NA			NA		08/07/2006
		 Fram				0.17 MI	N Dead En	d			<b></b>					
732) Cedar Lane	0.18	280	R								NA			NA	1	08/07/2006
<u> </u>		To				89-630 C	ourthouse	Rd		-						
Embroy Mill Pd	0.60	2200			8	9-628 Wit	nding Cree	k Rd	_					NIA		00/46/0000
(33) Embley Will Ad	0.00	5200 To:				De	ad End							NA	1	09/16/2003
		Fmm				De	ad End				<u> </u>					
734) Eley Rd	1.00	600	R								NA			NA	ſ	09/16/2003
<u> </u>		To:				<u>US 17 W</u>	arrenton F	ld								
	0.04	Fmm	Ļ			De	ad End									
735) Wyatt Lane	0.31	280	<u>к</u>								NA 			NA	(	09/25/2006
	0.15	620				0.31 MN	V Dead En	d		_				NIA		00/05/0000
735) Wyall Lane	0.15	030 To:				89-753	Enon Rd	_						NA	(	09/25/2006
		From				89-706	Marsh Rd				+		····			
736)	0.05	40	R	4.488							NA			NA	,	10/07/2003
		to:				US 17 W	arrenton R	.d								
		From:				Dea	ad End									
737) Jay Rd	0.08	<b>48</b> те:	R			90 720 1 -	aka Shom I							NA	1	10/05/2006
		Fmm				90 721 L	Jameston D	<u>, , , , , , , , , , , , , , , , , , , </u>			<u> </u>					-
738) Carroll Circle	0.15	160	R			07-131 1	nampton D	1			 NA			NA	ſ	07/08/2003
	-	To:				Cul-	-de-Sac									
~		Fmm				89-730 La	ake Shore I	Dr								
739)	0.20	190	R								NA			NA	C	07/08/2003
-		167				89-791	Heather Pl				1					

.

### Virginia Department of Transportation Traffic Engineering Division 2009 Annual Average Daily Traffic Volume Estimates By Section of Route Stafford Maintenance Area

Route	Length	AADT	QA	4Tire	Bus	 2Axi	e 3+A	-Truck vde 1Trail	2Trail	QC	K Factor	QK	Dir Factor	AAWDT	QW	Year
Stafford County																
(727) Monroe Farm Rd	0.70	70	°L			1	Dead Er	nd						NA		08/23/2006
		Te				89-655	Holly C	omer Rd								_
		From				89-61	1 Widew	vater Rd								
(728)	0.01	140	R								NA			NA		09/24/2003
		From				0.01	1 MN 89	-611								
(728)	1.30	100 To	R			1	Deed Er							NA		09/24/2003
		Emm	I					ы 								
(720) Lake Shore Dr	0.17	110	R			89-7	/1/ Suss	ex St						NA		09/28/2006
		to				80.7	13 Fede	mt Dr								
(730) Lake Shore Dr	0.30	450 From	R			07-1	15 Feue				NA			NA		09/28/2006
						89-1	1151 Be	ll Rd								
(730) Lake Shore Dr	0.05	380	R				1101 De				NA			NA		09/28/2006
<u> </u>			· · · · ·				89-739				<b>—</b>					
(730) Lake Shore Dr	0.07	190	R								NA			NA		09/28/2006
$\smile$		To				89.	-737 Jay	Rd			<b></b>					
(730) Lake Shore Dr	0.30	150	R						-		NA			NA		09/28/2006
<u> </u>		From				89-73	1 Hamp	ton Dr								
(730) Lake Shore Dr	0.42	190	R					-	-		NA			NA		09/28/2006
<u> </u>		To			89-7	/16 Kent	t Ave; G	reenwood Dr	•							
	0.07	From				]	Dead En	d								07/00/0000
(731) Hampton Dr	0.07	40	к ——								NA			NA		07/08/2003
	0.09		Ļ			89-738	8 Carroll	Circle						NIA		07/08/0002
(731) Hampton Di	0.00	310 To:				89-730	) Lake Si	hore Dr						INA		07/08/2003
		From:					Dead En	d								
(732) Cedar Lane	0.17	90	R				Deud En				NA			NA		08/07/2006
9		Ta				0.17 M	MN Dea	d End						-		
(732) Cedar Lane	0.18	280	R								NA			NA		08/07/2006
0		To:				89-630	Courtho	ouse Rd								
~		Fmm			8	9-628 W	Vinding	Creek Rd						_		
(733) Embrey Mill Rd	0.60	3200	R								NA			NA		09/16/2003
		Ener				L	Jead En	d		_						
Flev Rd	1 00	600	R			L	Jead En	d						NΔ		00/16/2003
(134) 2.09 110	1.00	To:				US 17	Warren	ton Rd						10		03/10/2003
		Fra					Dead En	d			I					
(735) Wyatt Lane	0.31	280	R								NA			NA		09/25/2006
$\smile$						0.31 N	MN Dea	d End			7					
(735) Wyatt Lane	0.15	630	R								NA			NA	,	09/25/2006
<u> </u>		To:				89-7	753 Enor	n Rd								
$\frown$	0.05	From:				89-70	06 Mars	h Rd								
(736)	0.05	<b>4</b> 0 те:	ĸ			US 17	Warrent	on Rd						NA		10/07/2003
		From					Varien	4			+					_
(737) Jay Rd	0.08	48	R				Jeau En	1	-		_J NA			NA		10/05/2006
		Ťø:				89-730	Lake Sh	ore Dr								
		From				89-731	1 Hampt	on Dr								
(738) Carroll Circle	0.15	160	R								NA			NA	ſ	07/08/2003
<u> </u>		To:				<u></u> Cı	ul-de-Sa	c								
	0.20	Fmm:				89-730	Lake Sh	ore Dr						NIA		07/00/0000
(739)	0.20	19U Tel	ĸ			89.79	Heath	er Pi						ΝA	(	07/08/2003

0

٠,

· ·

### Virginia Department of Transportation Traffic Engineering Division 2010 Annual Average Daily Traffic Volume Estimates By Section of Route Stafford Maintenance Area

Route	Length	AADT	QA	4Tire	Bus	 2A		3+A)	Truck de 1Tra	il 2Tra	ail QC	K Factor	QK	Dir Factor	AAWDT	QW	Year
Stafford County																	
(721) Old Concord Rd	1.12	1800	R			1	89-68	7 Норс	Rd						ΝΔ		10/10/2003
		To				_	De	ad End	1						INA.		10/10/2003
		Fmm					De	ad End	1			-					
(722) Paul Hill Rd	0.30	120	R									NA			NA		10/02/2003
		Tn	e			89-6	504 B	elle Pl	ains Rd								
	0.60	From					De	ad End									
(723) Jacobs Larie	0.60	3U To	R I			US	17 W	Varnent	on Rd						NA		10/07/2003
		From	I			03	De	ad End									
(724) Clark Patton Rd	0.95	290	R				50	au Lin				NA			NA		10/07/2003
		To				US	17 W	Varrent	on Rd		_						
		From					De	ad End	l								
(725) Cedar Grove Rd	0.40	30	R									NA			NA		08/28/2006
<u> </u>						US	17 W	arrent	on Rd								
	0.00	From:	Ļ				De	ad End									
(726) Hall Lane	0.30	26U Te:	к Г			80.6	55 140	Jly Co	mer Pd	_					NA		10/09/2003
		Fmm	I I			89-0.	Don CC	niy Co	mer Ku								
(727) Monroe Farm Rd	0.70	70	R				Dea								NA		08/23/2006
		To:				89-6	55 Ho	lly Co	mer Rd			ΞÎ.			TW/ Y		00/20/2000
		From				89-6	511 W	/idewa	ter Rd				-				
(728)	0.01	140	R									NA			NA		09/24/2003
$\smile$		To				0	.01 M	1N 89-0	511								
(728)	1.30	100	R				1					NA			NA		09/24/2003
$\bigcirc$		To:					Dea	ad End									
		From:				89	9-717	Susse	ι St								
(730) Lake Shore Dr	0.17	110	R									NA			NA		09/28/2006
		To: From:				89	-713	Federa	l Dr								
(730) Lake Shore Dr	0.30	450	R									NA			NA		09/28/2006
		To: From				8	9-115	I Bell	Rd								
(730) Lake Shore Dr	0.05	380	R									NA			NA		09/28/2006
		To: From:					89	-739									
(730) Lake Shore Dr	0.07	190	R									NA			NA		09/28/2006
		To: From				1	89-73	7 Jay R	d								
(730) Lake Shore Dr	0.30	150	R									NA			NA		09/28/2006
		To: Fram			_	89-	731 H	lampto	n Dr		*-*						
(730) Lake Shore Dr	0.42	190	R									NA			NA	4	09/28/2006
					89-7	16 Ke	ent Av	ve; Gre	enwood Dr								
Hampton Dr	0.07	<sup>™™</sup> [	P				Dea	id End							NIA		07/00/2002
(131) Hampion Br	0.07	-10													INA	,	07700/2003
Hampton Dr.	0.08	STO From	p			89-7	/38 Ca	arroll C	lircle						NIA		2000/2002
	0.00	To:				89-7	30 La	ke Sho	re Dr						1975	,	57700/2003
		Fma					Dea	d End				<u> </u>					
(732) Cedar Lane	0.17	90	R				Deu	d Lind				NA			NA	(	08/07/2006
0	_					0.15	7 MN	Dead	End								
(732) Cedar Lane	0.18	280 From L	R			0.11		Dead				NA			NA	(	08/07/2006
<u> </u>	<u> </u>	To				89-63	30 Co	urthou	se Rd								
~		From	_		8	9-628	Winc	ding Cr	eek Rd								
(733) Embrey Mill Rd	0.60	3200	R									NA			NA	C	09/16/2003
		<del>۳</del>					Dead	d End									
	4.00	Free					Dead	d End		_							
(734) Elley Ru	1.00	000	ĸ			110 1	7 11/2		. D.d						NA	(	9/16/2003

6

۶.

.

### Virginia Department of Transportation Traffic Engineering Division 2011 Annual Average Daily Traffic Volume Estimates By Section of Route Stafford Maintenance Area

Route	Length	AADT	QA	4Tire	Bus	True 2Axle 3+Axle	ck 1Trail 2	Trail QC	K Factor	QK	Dir Factor	AAWDT	QW	Year
(733) Embrey Mill Rd	0.60	Бтт 3200 т	"  R			89-628 Winding Creel	k Rd		NA			NA	<u> </u>	09/16/2003
(734) Eley Rd	1.00	Fm 600	R			Dead End	d					NA		09/16/2003
(735) Wyatt Lane	0.31	<sup>Fm,</sup>	R			Dead End						NA		09/25/2006
(735) Wyatt Lane	0.15	630	R			0.31 MN Dead End	1					NA	<u> </u>	09/25/2006
(736)	0.05	40	' R			89-706 Marsh Rd						NA		10/07/2003
(737) Jay Rd	0.08	48	* R			Dead End	d					NA		10/05/2006
(738) Carroll Circle	0.15	Tr From 160	R			89-730 Lake Shore I 89-731 Hampton D	r					NA		07/08/2003
(739)	0.20	Free 190	R			Cul-de-Sac 89-730 Lake Shore D	Dr			<u>.</u>		NA		07/08/2003
740 Maple St	0.15	From 90	R			89-791 Heather Pl 89-744 Rumford Rd	 l				•	NA		09/26/2006
741) Wood Rd	0.30	From 150	R		5	89-627 Mountain View	Rd					NA		09/16/2003
(742)	0.27	From 90 To	R			US 1 Jefferson Davis H	lwy					NA		10/20/2003
743 Mimosa St	0.13	From. 190 Te	R			89-744 Rumford Rd 89-680 Leonard St						NA		09/26/2006
744) Rumford Rd	0.06	From.	R			89-743 Mimosa St						NA		09/26/2006
744) Rumford Rd	0.06	150 From	R			89-686 May St			NA			NA	(	09/26/2006
744 Rumford Rd	0.06	170 <sup>Fmm</sup>	R			89-740 Maple St						NA	(	09/26/2006
744 Rumford Rd	0.09	150 To:	R			SR 3 Kings Hwy						NA	(	09/26/2006
745 Old Mount Rd	0.10	From: 9 To:	R			89-637 Telegraph Rd Dead End						NA	(	09/11/2006
746 Ravenwood Dr	0.13	From: 120 To:	R		8	9-627 Mountain View Dead End	Rd					NA	1	10/28/2003
747) Beauregard Dr	0.15	From: 30 To:	R			89-753 Enon Rd						NA		09/25/2006
748) Jack Ellington Dr	0.22	From 300	R			Dead End						NA	1	0/07/2003

.

ь <sup>1</sup>

#### Virginia Department of Transportation Traffic Engineering Division 2012 Annual Average Daily Traffic Volume Estimates By Section of Route Stafford Maintenance Area

	Route	Length	AADT	QA	4Tire	Bus	 2Axle 3+,	Truck Axle 1Trail	2Trail QC	K Factor	QK	Dir Factor	AAWDT	QW	Year
	Stafford County														
	(722) Embrey Mill Rd	0.60	2400	۲ R			89-628 Windin	g Creek Rd					ΝΔ		08/28/2012
5		0.00	<b>2400</b>				Dead E	nd					INA		00/20/2012
			From	-			Dead F	nd		<u> </u>					
	(734) Eley Rd	1.00	650	R						NA			NA		09/05/2012
	$\smile$		Te	<b>5</b> :			US 17 Warre	nton Rd							
	~		From	s			Dead E	nd							
	(735) Wyatt Lane	0.31	400	R						NA			NA		11/14/2012
			Te From	÷			0.31 MN De	ad End							
	(735) Wyatt Lane	0.15	780	R						NA			NA		11/14/2012
:			Ta				89-753 En	on Rd							
		0.05	From	۲ <u>ل</u>			89-706 Ma	sh Rd							
	(736) Warsh Ru	0.05	90 To	R R			LIS 17 Warm	nton P.d					NA		09/11/2012
:			Fmm			_	0317 Walle					·			
	(727) Jay Rd	0.08	50	R			Dead E	nd					NIA		00/42/2042
	(13) 04) 14	0.00	To				89-730 Lake	Shore Dr					no.		09/12/2012
			From	1			89-731 Ham	nton Dr							
	(738) Carroll Circle	0.15	100	R			or ror man	NOIL DI					NA		09/12/2012
			То				Cul-de-S	ac							
-			From				89-730 Lake S	hore Dr							
	(739) Holly Circle	0.20	200	R						NA			NA		09/20/2012
	<u> </u>		То				89-791 Heat	her Pl							
	<u></u>		From				89-744 Rumi	ord Rd							
	(740) Maple St	0.15	90	R						NA			NA		09/26/2006
1						_	89-680 Leor	ard St							
	Wood Rd	0.30	190	L			89-627 Mountai	n View Rd					NIA		00/00/0040
	(141) WOOD ING	0.50	Tou				Dead Fr						INA		06/06/2012
-			From	1			IS 1 lefferson [	avie Huar		_					
	(742) Jumping Branch Rd	0.27	100	R			05 T Jeneison L	avis i i wy					NA		08/08/2012
			To				Dead Er	id							
-			From				89-744 Rumf	ord Rd							
	(743) Mimosa St	0.13	190	R						NA			NA		09/26/2006
-	<u> </u>		To				89-680 Leon	ard St							
			From				89-743 Mim	osa St							
(	(744) Rumford Rd	0.06	90	R						NA			NA		09/06/2012
-	~		To From				89-686 Ma	y St							_
1	(744) Rumford Rd	0.06	120	R						NA			NA		09/06/2012
-			To- Fram	$\mathbf{h}_{i} = \mathbf{h}_{i}$			89-708 Pollo	ck St							
(	(744) Rumford Rd	0.06	250	R						NA			NA		09/06/2012
-	<u> </u>	-	T Fmm				89-740 Map	le St							
(	(744) Rumford Rd	0.09	90	R						NA			NA	(	09/06/2012
-	<u> </u>		To	_			SR 3 Kings	Hwy							_
		0.40	From	_			89-637 Telegr	aph Rd							
(		0.10	2 Ta	R			Deed Fe						NA	(	07/30/2012
-							Deau En								
	Ravenwood Dr	0.13	20	R		8	9-627 Mountain	View Rd					NIA		11/1/2012
(	140)	0.10	To	-			Dead En								11/14/2012
-		-	From:				89-753 Eno	n Rd		-	-				
(	747) Beauregard Dr	0.15	40	R						NA			NA		11/05/2012
_	$\smile$		To				Cul-de-Sa	IC							
-			From				Dead En	1							
(	748) Jack Ellington Dr	0.22	270	R						NA			NA	(	07/19/2012
	$\sim$		To:			8	9-752 Richards	Ferry Rd		1					

9/6/2013

ή

÷ •

### Virginia Department of Transportation Traffic Engineering Division 2007 Annual Average Daily Traffic Volume Estimates By Section of Route Stafford Maintenance Area

Route	Length	AADT	QA	4Tire	Bus	2A)	de 3-	Tru +Axle	ck 1Trail	2Trail	QC	K Factor	QK	Dir Factor	AAWDT	QW	Year
Stafford County							1 4 2 2	00.1600									
(1907) Grace Ct	0.12	140	L			89	-1433;	89-1602							NA		10/28/2003
	0=	Tn					Cul-de	-Sac				Т. П					10/20/2000
		From					Cul-de	e-Sac									
(1604) Whitestone Dr	0.32	1200	R									NA			NA		10/28/2003
<u> </u>		Tn:				89-642	Barret	t Height	s Rd								
	0.00	From				89-148	36 Aust	in Ridge	Dr 🚽								4440/0000
(1605) Francis Ct	0.30	09U	ĸ				Cul-de	-Sac							NA		11/13/2003
<u></u>		From				90	1605 E	munoic C	•								
(1606) Morrissev Stone Ct	0.18	180	R			07-	10051		1						NA		11/13/2003
(1000)		Ťn					Cul-de	-Sac									
·····		From				89-	1605 F	rancis C	t								
(1607) Brush Everbard Ct	0.15	220	R									NA			NA		11/13/2003
$\smile$		Ta				89-1	790 La	favette S	St								
(1607) Brush Everbard Ct	0.84	730	R									NA			NA		11/13/2003
$\smile$		To:	2				Cul-de	-Sac									
-		From					Cul-de	-Sac									
(1608) Newport Ct	0.08	110	R									NA			NA		11/13/2003
		Ťα				89-	-1607; 8	89-1609		-							_
	0.45	From:				89-	-1607; 8	89-1608		- 11							
(1609) Barlow House Ct	0.15	160 ™	R	-	_	_	Culda	<b>C</b>							NA		11/13/2003
		Emer	_			00 ( 10	Cui-ae	-580									
Ridgewood Dr	0.30	220	R	_		89-642	Barrett	Heights	Kđ						NΔ		11/13/2003
(1610) Hudgewood Di	0.00	To:				89	-1202 (	Dak Rd	-						11/1		11/13/2003
		From:				89-16	10 Ride	boows	Dr								
(1611) Glendale Dr	0.14	110	R			0/ 10	10 144					NA			NA		07/26/2006
		To:					Cul-de	-Sac									
_		From.					Cul-de	-Sac									
(1612) Nassau Ct	0.11	90	R						<i>.</i>			NA			NA		08/03/2006
<u> </u>		To:			8	9-1607	Brush	Everbar	d Ct								_
0		From				89	-1202 (	Dak Rd									
(1614) Rocky Stone Rd	0.15	140													NA		07/26/2006
		P					Cui-de-	-Sac									
Christopher Way	0.41	1200	R		-		Cul-de-	-Sac							ΝΔ		07/20/2006
(1615) Chinistophier Way	0.41	1200	<u></u>		89	9-1482	Northh	amnton	Blvd			Π			IN/N		0772072000
		Fmm		-			Cul-de.	Sac				<u> </u>					
(1616) Legal Ct	0.15	150	R		-		cur uc	040				NA			NA		07/20/2006
		τn				89-	1618; 8	9-1617									
		Fmm	_			89-	1618; 8	9-1616		_							_
(1617) Queens Mill Ct	0.14	820	R									NA			NA		07/20/2006
$\smile$		Ter	_		_		Cul-de-	-Sac			_						
		From		_	_	89-733	Embre	y Mill I	۲d								
(1618) Eustace Rd	1.31	3700	R									NA			NA		07/20/2006
<u> </u>		10.		_		89-7	51 Eus	tace Rd									
$\bigcirc$	0.20	Fmm				(	Cul-de-	Sac							<b>N1</b> 0		07/4 4/0002
(1619)	0.20	130 ™[	ĸ			80-1	1620 \$	em Dr							NA		07/14/2003
		Fran			00	1141 7	020 31	d Court	n/ D-								
(1620) Sierra Dr	0.19	320	R		07-	11011	ownan	ia Coun	IY DE						NA		10/10/2006
						90.175	11 77	- De d D									
Sierra Dr	0.18	510	R		_	89-162	21 1 1781	IS ENG R	.a						NΔ		07/14/2003
	0.10	Te:				(	Cul-de-	Sac	_			٦ <sup>°°</sup>					0111-12000

 $\rightarrow$ 

.
# Virginia Department of Transportation Traffic Engineering Division 2008 Annual Average Daily Traffic Volume Estimates By Section of Route Stafford Maintenance Area

Route	Length	AADT	QA	4Tire	Bus	2Axle	Tru 3+Axle	ck 1Trail	2Trail	QC	K Factor	QK	Dir Factor	AAWDT	QW	Year
Stafford County																
Nassau Ct	0.11	90				Cu	l-de-Sac							ΝΔ		08/03/2006
	0.11	Ta			8	9-1607 Br	ush Everba	ard Ct			Τ			11/5		00/03/2000
		From				89-12	02 Oak Rd									_
(1614) Rocky Stone Rd	0.15	140	R								NA			NA		07/26/2006
		To				Cul	l-de-Sac				7					
~		From				Cul	I-de-Sac									
(1615) Christopher Way	0.41	1200	R								NA			NA		07/20/2006
<u> </u>		To:			8	9-1482 Not	rthhamptor	ı Blvd	• •		1					
	0.45	From:	L			Cul	l-de-Sac									
(1616) Legal Ct	0.15	150	ĸ			90 161	9, 90 1617	,						NA		07/20/2006
		From				89-101	8; 89-101									
Queens Mill Ct	0 14	820	R			89-161	8; 89-1616	)						NIA		07/20/2006
	0.14	To				Cul	-de-Sac							1974		07/20/2000
		From.				80-733 Er	nbrey Mill	Þd								
(1618) Eustace Rd	1.31	3700	R			07-755 EI	norcy with	Ku		_				NA		07/20/2006
		To				89-751	Eustace Re	1		-						0112012000
		Fmm				Cul	-de-Sac									
1619	0.20	130	R								NA			NA		07/14/2003
$\bigcirc$		To:				89-162	0 Sierra Di									
~		From			89-	1161 Town	n and Cou	try Dr								
1620) Sierra Dr	0.19	320	R								NA			NA		10/10/2006
~		To: From.				89-1621 7	Trails End	Rd								
1620) Sierra Dr	0.18	510	R								NA			NA		07/14/2003
<u> </u>		To:				Cul	-de-Sac			_	1					
		From:				Cul	-de-Sac	_								
1621) Trails End Rd	0.09	400	R								NA			NA	1	07/14/2003
<u> </u>		To: Fram:				89-1620	) Sierra Dr				]					
1621) Trails End Rd	0.07	240	R								NA			NA		10/10/2006
<u> </u>						89-1162	Meadow D	r	-							
	0.44	From	0			89-1162	Meadow E	r	_							
	0.14	170 Tel	R			Cul	de Sac							NA	I	07/14/2003
		From	_			Cul	de See			_						
Barbara Ann Dr	0 27	750	R			Cui-	-ac-sac							ΝΔ		10/28/2003
1623)	0.27	Tn:			8	9-628 Win	ding Creek	Rd		-	Т <sup>°</sup>			na Na		10/20/2003
		From:				89-1623	3: 89-1625									
1624) Craig Ct	0.05	50	R								-J NA			NA		10/28/2003
		Tn:				Cul-	de-Sac									
		From	_			Cul-	de-Sac	-					-			
1625) Theresa Dr	0.25	440	R								NA			NA		10/28/2003
<u> </u>		To:				89-1623	3; <u>89-162</u> 4									
		From:				89-1625	Theresa D	r								
1626) Tom Ct	0.04	40	R				_				NA			NA	1	10/28/2003
		101				Cul-	de-Sac									
	0.04	From				Cul-	de-Sac									
1627) Frank Ct	0.04	0C Te:	ĸ			80 1636	Thomas D							NA	1	10/28/2003
						37-1023	a c					-				
Keith Ct	0.04	47	R			Cul-	de-Sac							NA	A	10/28/2002
	0.04	To:	13			89-1623	: 89-1629							IN/A	1	0/20/2003
		Fmm				80,1622	. 80_1679				+					
1629) Cory Ct	0.05	60 L	R			07-1023	, 07-1020				-J NA			NA	1	0/28/2003
		To:				Cul-c	de-Sac				٦					

41

#### Virginia Department of Transportation Traffic Engineering Division 2009 Annual Average Daily Traffic Volume Estimates By Section of Route Stafford Maintenance Area

								-									
Route	Length	AADT	QA	4Tire	Bus	 2Ax		Truck Axle 1Tr	rail 21	Trail	C F	K Factor	QK	Dir Factor	AAWDT	QW	Year
Stafford County					•					Treat				1 20101			
Morrissev Stone Ct	0 18	fma 180	R			89-	1605 Fra	uncis Ct							NA		11/13/2003
	0.10	Ta					Cul-de-	Sac				Ĵ			1963		11/10/2003
		From				89-1	1605 Fr	ancis Ct				T					
(1607) Brush Everbard Ct	0.15	220	R									NA			NA		11/13/2003
		From				89-1	790 Laf	ayette St				]—					
(1607) Brush Everbard Ct	0.84	730	R									NA			NA		11/13/2003
<u> </u>		То					Cul-de-	Sac									
	0.00	Fmm	Ļ				Cul-de-	Sac				]					44/40/0000
(1608) Newport Ct	0.08	TIU	ĸ			89.	1607-8	9-1609							NA		11/13/2003
		From				89_	1607.8	9-1608				<u> </u>					
(1609) Barlow House Ct	0.15	160	R			0)-	1007, 0	-1000				NA			NA		11/13/2003
		Ta					Cul-de-	Sac				1					
		Fmm				89-642	Barrett I	leights Rd		_							
(1610) Ridgewood Dr	0.30	220	R									NA			NA		11/13/2003
<u> </u>		Ta	<u> </u>			89-	-1202 O	ak Rd									
	0.44	From:	Ļ			89-161	10 Ridge	wood Dr				]					07/00/0000
(1611) Gieridale Dr	0.14	11U Te:	ĸ				Cul-de-	Sac							NA		07/26/2006
		From					Cul de	Sac				1					-
(1612) Nassau Ct	0.11	90	R				Lui-de-2	Jac				J NA			NA		08/03/2006
		To				89-1607	Brush F	verbard Ct				7					00.00.2000
		From				89-	1202 O	ak Rđ									_
(1614) Rocky Stone Rd	0.15	140	R					_				NA			NA		07/26/2006
<u> </u>		To:				(	Cul-de-S	lac									
		From				(	Cul-de-S	lac									- Contra
(1615) Christopher Way	0.41	1200 To	R			0 1403 1		D1	1			NA T			NA		07/20/2006
					8	9-1482 1	Norunna		3			<u> </u>					
Legal Ct	0 15	150	R	-			Jul-de-S	ac							NΔ		07/20/2006
(1616) Logar Or	0.10	Ta:				89-1	1618: 89	-1617				1			110		0112012000
		From				89-1	1618: 89	-1616				1		_			_
(1617) Queens Mill Ct	0.14	820	R									NA			NA		07/20/2006
<u> </u>		To:				(	Cul-de-S	ac				1					
~		Fmm				89-733	Embrey	/ Mill Rd				]					
(1618) Eustace Rd	1.31	3700	R									NA			NA		07/20/2006
		10.				89-7	51 Eusta	ice Rd									
	0.20	120	D			(	<u>Cul-de-S</u>	ac							NA		07/14/2002
(1619)	0.20	100	ĸ			89-1	620 Sie	ma Dr				1			N/A		07714/2003
-		From			80	-1161 T	own and	Country D	)r			<u> </u>					
(1620) Sierra Dr	0.19	320	R			-1101 11	Julian	county D				J NA			NA		10/10/2006
		Ťo				89-162	1 Trails	End Rd				1					
(1620) Sierra Dr	0.18	510 From: L	R			07/102	1 Trans	Lind ited				NA			NA		07/14/2003
		To:				C	Jul-de-S	ac				]					1.1.1.1
		From:				C	Jul-de-S	ac									7
(1621) Trails End Rd	0.09	400	R								I	NA			NA		07/14/2003
~		From				89-1	620 Sie	rra Dr				<b> </b>					
(1621) Trails End Rd	0.07	240	R								1	NA			NA		10/10/2006
<u> </u>		To:				89-11	62 Mea	low Dr									
	0.44	From	0			89-11	62 Mea	low Dr									07/4 4/0000
(1622) Failing water Ct	0.14	ט <i>ו</i> ר הר	ĸ				ul de S				1	NA I			NA	I	07/14/2003

)

.

. -

# Virginia Department of Transportation Traffic Engineering Division 2010 Annual Average Daily Traffic Volume Estimates By Section of Route

Stafford	Maintenance Area	

Route	Length	AADT	QA	4Tire	Bus	Tr 2Axle 3+Axle	uck	2Trail	QC	K Factor	QK	Dir Factor	AAWDT	QW	Year
Stafford County															
locoph Ct	0.16	260	۴L			Cul-de-Sac							<b>N1</b> A		40/00/000
(1602) JUSEPH CT	0.10	200		··· *		89-1433: 89-16	)3						NA		10/28/200
		From	•			89-1433-89-16				- <u>-</u>					
(1603) Grace Ct	0.12	140	R			07-1455, 07-10	12			NA			NA		10/28/200
<u> </u>		- Te	e 🗌			Cul-de-Sac			- -						
~		From				Cul-de-Sac									
(1604) Whitestone Dr	0.32	1200	R							NA			NA		10/28/200
		Te			89	-642 Barrett Heig	nts Rd						_		
	0.20	Free			8	9-1486 Austin Rid	ge Dr								44/40/000
(1605) Francis Ct	0.30	090	- <u>-</u> -			Cul-de-Sac							NA		11/13/200
·····		From				90 1605 Empire	C+		- · · · ·	+			-		_
(1606) Morrissev Stone Ct	0.18	180	R			69-1005 Flancis							NA		11/13/200
		To				Cul-de-Sac				Т.					11/10/200
		From				89-1605 Francis	Ct		_						
(1607) Brush Everbard Ct	0.15	220	R							NA			NA		11/13/200
$\smile$		T.	<u> </u>			89-1790 Lafavette	St								
(1607) Brush Everbard Ct	0.84	730	R							NA			NA		11/13/200
$\smile$		To				Cul-de-Sac									
		From				Cul-de-Sac				1	_				
(1608) Newport Ct	0.08	110	R							NA			NA		11/13/200
<u> </u>		To				89-1607; 89-160	9								_
	0.45	From	Ļ			89-1607; 89-160	8								
(1609) Barlow House Ct	0.15	160	<u>к</u>			Cul de See							NA		11/13/200
		Fran			80	Cul-ue-Sac	(- D.)			+					
Ridgewood Dr	0.30	220	R		89	-042 Вапел неідг	IS KO						ΝΔ		11/13/200
(1810) - adgeneed Br	0.00	Te:				89-1202 Oak Ro				Ϋ́ Γ					11/13/200
		From			8	9-1610 Ridgewoo	1 Dr			1					
(1611) Glendale Dr	0.14	110	R							NA			NA	(	07/26/2000
$\bigcirc$		Ťø				Cul-de-Sac									
		From.				Cul-de-Sac									
(1612) Nassau Ct	0.11	90	R							ŇA			NA	(	08/03/2006
<u> </u>		To:			89-	1607 Brush Everb	ard Ct								
	0.45	From				89-1202 Oak Ro									
(1614) ROCKY Stone Rd	0.15	14U Te	ĸ			Cul da Saa							NA	(	07/26/2006
						Cui-de-Sac									_
Christopher Way	0.41	1200	R			Cul-de-Sac							ΝΔ		000000
	0.11	т.			89-1	482 Northhampto	1 Blvd						11/1		5/720/2000
		Fmm				Cul-de-Sac									
(1616) Legal Ct	0.15	150	R			cur de oue				NA			NA	C	07/20/2006
		То				89-1618; 89-161	7	-							
		From:				89-1618; 89-1610	;;								
(1617) Queens Mill Ct	0.14	820	R							NA			NA	0	07/20/2006
<u> </u>		Tn		_		Cul-de-Sac									
		From			89	-733 Embrey Mill	Rd								101
(1618) Eustace Rd	1.31	3700	R							NA			NA	C	7/20/2006
		Tn				89-751 Eustace R	d								
	0.00	From				Cul-de-Sac									
(1619)	0.20	ר - ד~ו	к			90 1/20 01							NA	C	07/14/2003
		I				69-1020 Sierra D									_
Sierra Dr	0.10	320	P		89-11	61 Town and Cou	try Dr						NIA		0/10/2002
10201 01011 01	0.13	5£0 ™[	IX.			-1621 Trails End	Pd			איז ד			NA	1	0/10/2006

٣

#### Virginia Department of Transportation Traffic Engineering Division 2011 Annual Average Daily Traffic Volume Estimates By Section of Route Stafford Maintenance Area

	Route	Length	AADT	QA	4Tire	Bus	 2Ax	le 3+A	-Truck xle 1Tr	ail 2Tr	rail	SC	K Factor	QK	Dir Factor	AAWDT	QW	Year
	Stafford County																	
		0.15	460	▫└				Cul-de-S	ac			_						07/00/0000
	(1616) Legal Cl	0.15	150				89.	1618-89	1617							NA		07/20/2006
			Free				80	1619.90	1616				+					
	(1617) Queens Mill Ct	0.14	820	R			69-	1016; 69-	1010							NA		07/20/2006
			т	o:			(	Cul-de-S	ac				Π <sup>°</sup>					0112012000
			Free	n.			89-733	Embrey	Mill Rd									
~	(1618) Eustace Rd	1.31	3700	R									NA			NA		07/20/2006
$\supset$			T	0.			89-7	51 Eusta	ce Rd									
	~		Fro	n			(	Cul-de-Sa	ac									
	(1619)	0.20	130	R									NA			NA		07/14/2003
				* <b></b>			89-1	620 Sier	ra Dr									
		0.40	From	Ľ		89	9-1161 T	own and	Country D	)r								
	(1620) Sierra Dr	0.19	320										NA			NA		10/10/2006
			From				89-162	21 Trails	End Rd				]					
	(1620) Sierra Dr	0.18	510	. <mark>к</mark>				Tul de Ce				_				NA		07/14/2003
			Form	1				ui-de-Sa	ic				+					
	Trails End Rd	0.00	400	۲ <u>ــــــــــــــــــــــــــــــــــــ</u>			(	Cul-de-Sa	IC							NIA		07/44/2002
		0.00														11/1		07714/2003
		0.07	240 From				89-1	620 Sien	ra Dr							NIA		40/40/0000
	(1621) Trails Lind Rd	0.07	<b>240</b>				89-11	67 Mead	ow Dr							NA		10/10/2006
			From				80.11	62 Mead	ow Dr			_						
	(1622) Falling Water Ct	0.14	170	R			07-11	UZ IVICAU	UW DI							NA		07/14/2003
			Te				(	Cul-de-Sa	с				Т.					0111 112000
			From				(	Cul-de-Sa	c				Т					
	(1623) Barbara Ann Dr	0.27	750	R									NA			NA		10/28/2003
	$\smile$		To			1	89-628 V	Vinding (	Creek Rd									
	~		From				89-1	623; 89-	1625								- 10.00	
	(1624) Craig Ct	0.05	50										NA			NA		10/28/2003
	<u> </u>		To			_		lul-de-Sa	c									
		0.05	From	Ļ			C	Cul-de-Sa	с									
	(1625) Theresa Dr	0.25	440	R R			80.1	(22, 00)	(24							NA		10/28/2003
			r	<u> </u>			89-1	023; 89-1	-									
	Tom Ct	0.04	40	Ļ			89-16	25 There	sa Dr							NA		10/20/2002
	1626) 1011 01	0.04	To					'ul-de-Sa								IN/A		10/20/2003
			From					ul-de-Sa	~			-	+					
	(1627) Frank Ct	0.04	50	R				ur-uc-ba	<u>.</u>				NA			NA		10/28/2003
			To	[			89-16	25 There	sa Dr				7					
	_		From				Ċ	ul-de-Sa	•									
	(1628) Keith Ct	0.04	47	R									NA			NA		10/28/2003
			Ta:				89-1	623; 89-1	629									
	~		From				89-1	623; 89-1	628				]					
	(1629) Cory Ct	0.05	60	R									NA			NA		10/28/2003
:	<u> </u>	_	10:				<u> </u>	ul-de-Sac	:		_							
		0.40	From				89-6	06 Ferry	Rd				Ţ					
	1630 LOIG Pairlax Dr	U.4Z	JJU To:	ĸ			80,1629	Comun	Ilie Dr				אא ר			NA		10/02/2006
:			From				07-1030	Lawin	nus Dr				+					
	John Jay Rd	0.19	80	R			07-1020	Lord Fai	nax Dr							NA		10/02/2006
		0.10	To				89-163	6 Braddo	ck Dr				j			1974		0/02/2000
			From				89-1630	Lord Fai	rfax Dr				<u> </u>					
	(1632) Wolcott Rd	0.19	50	R									NA			NA	1	10/02/2006
	$\bigcirc$		Tn	-			89-163	6 Braddo	ck Dr				<b>-</b> -					

٠

۰ ۰

#### Virginia Department of Transportation Traffic Engineering Division 2012 Annual Average Daily Traffic Volume Estimates By Section of Route Stafford Maintenance Area

						Stafford Maintenance Area							
	Route	Length	AADT	QA	4Tire	Bus 2Axle 3+Axle 1Trail	Q 2Trail	C K Factor	QK	Dir Factor	AAWDT	QW	Year
	Stafford County												
		0.15	150	۳L		Cul-de-Sac							07/00/0000
	(1616) Legal Ot	0.15	130			89-1618: 89-1617					NA		07/20/2006
	· ····		From	1		90 1618, 80 1616		[					
	(1617) Queens Mill Ct	0.14	750	R		09-1018, 89-1010					NA		07/23/2012
			Te	•		Cul-de-Sac							0112012012
			From	·		89-733 Embrey Mill Rd							
1	(1618) Eustace Rd	1.31	3000	R				NA			NA		08/14/2012
_	$\smile$		Te			89-751 Eustace Rd							
	~		Free	r 📃		Cul-de-Sac							
	(1619) Rapids Way	0.20	180					NA			NA		09/17/2012
			Te	"		89-1620 Sierra Dr					· · · · · ·		
			From			89-1161 Town and Country Dr					**		
	(1620) Sierra Dr	0.19	320	R				NA			NA		10/10/2006
	<u> </u>		From		•	89-1621 Trails End Rd							
	(1620) Sierra Dr	0.18	300	_ <u>R</u>				NA			NA		09/17/2012
:	<u> </u>		To			Cul-de-Sac							
	<b>—</b> • • • • • •		Fmm			Cul-de-Sac							
	(1621) Trails End Rd	0.09	70	R				NA			NA		09/17/2012
	<u> </u>		From			89-1620 Sierra Dr							
	(1621) Trails End Rd	0.07	260	R				NA			NA		09/12/2012
:	<u> </u>		Ta			89-1162 Meadow Dr					<u> </u>		
	<u></u>		From			89-1162 Meadow Dr							
	(1622) Falling Water Ct	0.14	120					NA			NA		09/17/2012
:	<u> </u>		To:	1		Cul-de-Sac							
		0.07	From.	L		Cul-de-Sac							
	(1623) Barbara Ann Dr	0.27	500	<u> </u>				NA			NA		08/02/2012
:						89-628 Winding Creek Rd							
		0.05	70			89-1623; 89-1625							
	1624 Craig Ct	0.05	7 U To:			Cul-de-Sac					NA		08/02/2012
			Fma	1	_	Cul de Sac							
	Theresa Dr	0.25	410	R		Cul-de-Sac					ΝΔ		08/02/2012
	1625	0.20	To:			89-1623: 89-1624					IN/A	'	00/02/2012
-			Fmm			80-1625 Theress Dr.							
	Tom Ct	0.04	40	R		67-1025 Theresa Di		NA			NA	,	08/02/2012
			Ţa:			Cul-de-Sac							OUIDEDIE
			From			Cul-de-Sac							
	1627) Frank Ct	0.04	46	R				NA			NA	1	08/02/2012
	<u> </u>		To:			89-1625 Theresa Dr							
-	-		From:		-	Cul-de-Sac							
ł	1628 Keith Ct	0.04	60	R				NA			NA	(	08/02/2012
-	$\smile$		Tn			89-1623; 89-1629							
	<u>^</u>		From			89-1623; 89-1628							
(	1629) Cory Ct	0.05	60	R				NA			NA	(	08/02/2012
-	<u> </u>		Ťo:			Cul-de-Sac							
			From			89-606 Ferry Rd							
(	1630 Lord Fairfax Dr	0.42	720	R				NA			NA	(	08/16/2012
=			10:			89-1638 Comwallis Dr							
		0.40	Fra	-		89-1630 Lord Fairfax Dr							
(	1631) John Jay Ko	0.19	00 <sub>1.</sub> ۲	ĸ		00 1/2/ 0-11 1 0					NA	1	10/02/2006
=						89-1030 Braddock Dr							
		0.10	50 From:	D		89-1630 Lord Fairfax Dr							0/00/0000
(		0.19		<u></u>		89, 1636 Braddonk Dr					NA	1	0/02/2006
						07-1030 Distunk K LIF							

, " · · ·

Attachment 9 Page 85 of 113

# APPENDIX F BACKGROUND (2021) PEAK HOUR ANALYSIS WORKSHEETS



#### Intersection

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	95	13	86	159	25	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	103	14	93	173	27	76

Major/Minor	Minor1		Major1		Major2		
Conflicting Flow All	310	180	0	0	266	0	
Stage 1	180	-	-	-	-	-	
Stage 2	130	-	-	-	-	-	
Critical Hdwy	6.42	6.22	-	-	4.12	-	
Critical Hdwy Stg 1	5.42	-	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	-	
Follow-up Hdwy	3.518	3.318	-	-	2.218	-	
Pot Cap-1 Maneuver	682	863	-	-	1298	-	
Stage 1	851	-	-	-	-	-	
Stage 2	896	-	-	-	-	-	
Platoon blocked, %			-	-		-	
Mov Cap-1 Maneuver	667	863	-	-	1298	-	
Mov Cap-2 Maneuver	667	-	-	-	-	-	
Stage 1	851	-	-	-	-	-	
Stage 2	876	-	-	-	-	-	

Approach	WB	NB	SB	
HCM Control Delay, s	11.3	0	2.1	
HCM LOS	В			

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT	
Capacity (veh/h)	-	- 686	1298	-	
HCM Lane V/C Ratio	-	- 0.171	0.021	-	
HCM Control Delay (s)	-	- 11.3	7.8	0	
HCM Lane LOS	-	- B	А	А	
HCM 95th %tile Q(veh)	-	- 0.6	0.1	-	

#### Intersection

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	124	32	111	115	21	59
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	135	35	121	125	23	64

Major/Minor	Minor1		Major1		Major2		
Conflicting Flow All	293	183	0	0	246	0	
Stage 1	183	-	-	-	-	-	
Stage 2	110	-	-	-	-	-	
Critical Hdwy	6.42	6.22	-	-	4.12	-	
Critical Hdwy Stg 1	5.42	-	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	-	
Follow-up Hdwy	3.518	3.318	-	-	2.218	-	
Pot Cap-1 Maneuver	698	859	-	-	1320	-	
Stage 1	848	-	-	-	-	-	
Stage 2	915	-	-	-	-	-	
Platoon blocked, %			-	-		-	
Mov Cap-1 Maneuver	685	859	-	-	1320	-	
Mov Cap-2 Maneuver	685	-	-	-	-	-	
Stage 1	848	-	-	-	-	-	
Stage 2	899	-	-	-	-	-	

Approach	WB	NB	SB	
HCM Control Delay, s	11.6	0	2	
HCM LOS	В			

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT	
Capacity (veh/h)	-	- 715	1320	-	
HCM Lane V/C Ratio	-	- 0.237	0.017	-	
HCM Control Delay (s)	-	- 11.6	7.8	0	I
HCM Lane LOS	-	- B	А	А	
HCM 95th %tile Q(veh)	-	- 0.9	0.1	-	

#### Intersection

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	45	0	55	5	0	17	21	235	27	36	227	19
Conflicting Peds, #/hr	5	0	21	17	0	1	21	0	17	1	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	0	60	5	0	18	23	255	29	39	247	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	698	703	299	719	700	292	288	0	0	302	0	0
Stage 1	356	356	-	333	333	-	-	-	-	-	-	-
Stage 2	342	347	-	386	367	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	355	362	741	344	363	747	1274	-	-	1259	-	-
Stage 1	661	629	-	681	644	-	-	-	-	-	-	-
Stage 2	673	635	-	637	622	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	324	330	715	292	331	733	1252	-	-	1254	-	-
Mov Cap-2 Maneuver	324	330	-	292	331	-	-	-	-	-	-	-
Stage 1	635	595	-	657	621	-	-	-	-	-	-	-
Stage 2	639	612	-	552	589	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.1	11.9	0.6	1
HCM LOS	С	В		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1\	WBLn1	SBL	SBT	SBR	
Capacity (veh/h)	1252	-	-	463	546	1254	-	-	
HCM Lane V/C Ratio	0.018	-	-	0.235	0.044	0.031	-	-	
HCM Control Delay (s)	7.9	0	-	15.1	11.9	8	0	-	
HCM Lane LOS	А	А	-	С	В	А	А	-	
HCM 95th %tile Q(veh)	0.1	-	-	0.9	0.1	0.1	-	-	

#### Intersection

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	31	0	26	12	0	8	44	214	10	17	303	86
Conflicting Peds, #/hr	3	0	15	39	0	27	15	0	39	27	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	34	0	28	13	0	9	48	233	11	18	329	93

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	805	806	430	815	848	304	438	0	0	282	0	0
Stage 1	428	428	-	373	373	-	-	-	-	-	-	-
Stage 2	377	378	-	442	475	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	301	316	625	296	298	736	1122	-	-	1280	-	-
Stage 1	605	585	-	648	618	-	-	-	-	-	-	-
Stage 2	644	615	-	594	557	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	272	281	597	250	265	696	1086	-	-	1251	-	-
Mov Cap-2 Maneuver	272	281	-	250	265	-	-	-	-	-	-	-
Stage 1	567	567	-	595	567	-	-	-	-	-	-	-
Stage 2	590	565	-	537	540	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17	16.5	1.4	0.3
HCM LOS	С	С		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1V	VBLn1	SBL	SBT	SBR	
Capacity (veh/h)	1086	-	-	362	336	1251	-	-	
HCM Lane V/C Ratio	0.044	-	-	0.171	0.065	0.015	-	-	
HCM Control Delay (s)	8.5	0	-	17	16.5	7.9	0	-	
HCM Lane LOS	А	А	-	С	С	А	А	-	
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.2	0	-	-	

Attachment 9 Page 90 of 113

## HCM Unsignalized Intersection Capacity Analysis 5: Eustace Road & Hampton Park Road/Northampton Blvd

	≯	-	$\mathbf{r}$	1	←	*	٩.	1	1	1	Ŧ	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	el el		ľ	el 🕴			Ę	1	ľ	eî 🗧	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	109	168	5	40	130	68	2	153	50	50	68	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	118	183	5	43	141	74	2	166	54	54	74	36
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2				
Volume Total (vph)	118	188	43	215	168	54	54	110				
Volume Left (vph)	118	0	43	0	2	0	54	0				
Volume Right (vph)	0	5	0	74	0	54	0	36				
Hadj (s)	0.53	0.01	0.53	-0.21	0.04	-0.67	0.53	-0.19				
Departure Headway (s)	6.5	6.0	6.6	5.8	6.3	5.6	6.9	6.2				
Degree Utilization, x	0.21	0.31	0.08	0.35	0.30	0.08	0.10	0.19				
Capacity (veh/h)	526	575	518	587	538	596	486	543				
Control Delay (s)	10.1	10.5	8.9	10.7	10.7	7.9	9.5	9.4				
Approach Delay (s)	10.3		10.4		10.1		9.4					
Approach LOS	В		В		В		А					
Intersection Summary												
Delay			10.1									
Level of Service			В									
Intersection Capacity Utilization			44.1%	IC	CU Level o	of Service			А			
Analysis Period (min)			15									

Attachment 9 Page 91 of 113

## HCM Unsignalized Intersection Capacity Analysis 5: Eustace Road & Hampton Park Road/Northampton Blvd

	≯	-	$\mathbf{r}$	1	-	•	٩.	1	1	1	Ŧ	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ľ	¢Î		ľ	el el			Ę	1	ľ	eî 🗧	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	46	219	8	51	345	106	6	76	45	116	137	74
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	238	9	55	375	115	7	83	49	126	149	80
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2				
Volume Total (vph)	50	247	55	490	89	49	126	229				
Volume Left (vph)	50	0	55	0	7	0	126	0				
Volume Right (vph)	0	9	0	115	0	49	0	80				
Hadj (s)	0.53	0.01	0.53	-0.13	0.07	-0.67	0.53	-0.21				
Departure Headway (s)	7.5	7.0	7.1	6.5	7.7	7.0	7.7	7.0				
Degree Utilization, x	0.10	0.48	0.11	0.88	0.19	0.10	0.27	0.44				
Capacity (veh/h)	454	495	486	548	438	478	443	480				
Control Delay (s)	10.2	15.0	9.8	38.6	11.4	9.5	12.4	14.3				
Approach Delay (s)	14.2		35.7		10.7		13.6					
Approach LOS	В		E		В		В					
Intersection Summary												
Delay			22.5									
Level of Service			С									
Intersection Capacity Utilizatio	n		51.0%	IC	CU Level o	of Service			А			
Analysis Period (min)			15									

6/9/2016

Intersection: 3: Winding Creek Road & Embrey Mill Road

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	44	32
Average Queue (ft)	23	6
95th Queue (ft)	42	27
Link Distance (ft)	2103	3012
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Oueuing Penalty (veh)		

#### Intersection: 4: Eustace Road & Live Oak Lane/Middle School Ent.

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	72	28	24
Average Queue (ft)	48	11	5
95th Queue (ft)	74	32	21
Link Distance (ft)	2047	169	3516
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

#### Intersection: 5: Eustace Road & Hampton Park Road/Northampton Blvd

Movement	EB	EB	WB	WB	NB	NB	SB	SB	
Directions Served	L	TR	L	TR	LT	R	L	TR	
Maximum Queue (ft)	50	49	24	66	70	29	47	57	
Average Queue (ft)	36	38	24	46	47	17	34	45	
95th Queue (ft)	54	57	24	72	71	39	47	65	
Link Distance (ft)		1559		1206	617			912	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	150		340			200	250		
Storage Blk Time (%)									
Queuing Penalty (veh)									

6/9/2016

Intersection: 3: Winding Creek Road & Embrey Mill Road

Movement	WB
Directions Served	LR
Maximum Queue (ft)	44
Average Queue (ft)	30
95th Queue (ft)	47
Link Distance (ft)	2103
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Oueuing Penalty (veh)	

#### Intersection: 4: Eustace Road & Live Oak Lane/Middle School Ent.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	31	28	71	25
Average Queue (ft)	18	16	40	8
95th Queue (ft)	43	38	79	24
Link Distance (ft)	2047	169	2338	3516
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

#### Intersection: 5: Eustace Road & Hampton Park Road/Northampton Blvd

Movement	EB	EB	WB	WB	NB	NB	SB	SB	
Directions Served	L	TR	L	TR	LT	R	L	TR	
Maximum Queue (ft)	69	112	24	266	46	29	52	93	
Average Queue (ft)	45	64	24	171	29	23	45	60	
95th Queue (ft)	71	105	25	280	43	42	60	94	
Link Distance (ft)		1559		1206	617			912	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	150		340			200	250		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Attachment 9 Page 94 of 113

# APPENDIX G TOTAL FUTURE (2021) PEAK HOUR ANALYSIS WORKSHEETS



1

## Intersection

AND SHALL DON TANK	-10-1-1		12			and a state of	- Salar
Movement	WBL	WBR	1 33	NBT	NBR	SBL	SBT
Vol, veh/h	21	1		101	7	0	96
Conflicting Peds, #/hr	0	0		0	0	0	0
Sign Control	Stop	Stop		Free	Free	Free	Free
RT Channelized		None		-	None	-	None
Storage Length	0	-		-	-	-	-
Veh in Median Storage, #	0	-	V	0	•	-	0
Grade, %	0	-		0	-	-	0
Peak Hour Factor	92	92		92	92	92	92
Heavy Vehicles, %	2	2		2	2	2	2
Mvmt Flow	23	1	_	110	8	0	104
Matal Black	Minord		and the second second	Mojort	Concernant of the	Major?	-
	I TUTIN	444	and the lot of the	Majort	0	Majul/2	0
Connicung FIOW All	218	114		U	U	117	U
Stage 1	114			-	-	-	-
Stage 2	104	-		- 1.5		-	-
Critical Howy	6.42	6.22		-	-	4.12	•
Critical Hdwy Stg 1	5.42	-			-	-	
Critical Hdwy Stg 2	5.42	-		-		-	-
Follow-up Hdwy	3.518	3.318	1 1 H 7 1	-		2.218	
Pot Cap-1 Maneuver	770	939		-	•	1471	-
Stage 1	911			이번 실전문	-		-
Stage 2	920	-		-	-	-	-
Platoon blocked, %	RE_L	- statement of	202	11 U 0000-	-	274 LWS 3	
Mov Cap-1 Maneuver	770	939		•	-	1471	
Mov Cap-2 Maneuver	770	-	-	-		-	-
Stage 1	911	-		120.00	-	-	-
Stage 2	920	-		-	-	-	-
Approach	WB		10	NB		SB	18
HCM Control Delay, s	9.8		- 11. A.	0		0	
HCM LOS	A				1.00		1,2, 3
Minor Lane/Maior Mymt	NET	NBRWBLn1	SBL	SBT	A.		191 215
Canacity (veh/h)		- 776	1471	_			
HCM Lana V/C Ratio		- 0.031	-		New Contraction	101/1 (Str.)	100 8
11014 Cantal Dalay (a)		0,001	^	ALL ADDRESS CONTRACT	1.0		

FICM Lane V/C Ralio			0.031			
HCM Control Delay (s)	•	-	9.8	0	-	
HCM Lane LOS	-		Α	Α		
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

## Intersection

١

	- interior in	the same said		AF 33 8	100	1231 3 3	Distant State
Movement	WBL	WBR	12.67	NBT	NBR	SBL	SBT
Vol, veh/h	14	1		144	24	1	83
Conflicting Peds, #/hr	0	0		0	0	0	0
Sign Control	Stop	Stop		Free	Free	Free	Free
RT Channelized	•	None			None		None
Storage Length	0	-		-	-	-	-
Veh in Median Storage, #	0			0			0
Grade, %	0	- 10 - 10 - 10 - 10 - 10 - 10 - 10 - 10		0	-	-	0
Peak Hour Factor	92	92		92	92	92	92
Heavy Vehicles, %	2	2	1	2	2	2	2
Mvmt Flow	15	1		157	26	1	90
	ALC: NO			See Still No.	2011	MASSAL, DAS	
Major/Minor	Minor	SALE AND	N PAG	Major1		Major2	Dal V
Conflicting Flow All	262	170		0	0	183	0
Stage 1	170				-	-	-
Stage 2	92	1.4.9.9.7.2.	Size	-			-
Critical Hdwy	6.42	6.22		-	-	4.12	-
Critical Hdwy Stg 1	5.42	- 10	1.6%	-	-	-	-
Critical Hdwy Stg 2	5.42	-			-	-	-
Follow-up Hdwy	3.518	3.318		-		2.218	-
Pot Cap-1 Maneuver	727	874				1392	-
Stage 1	860	11 V	1.36		-		-
Stage 2	932				•		•
Platoon blocked, %	1.282	States	A LAN	-		816 <u>.</u>	-
Mov Cap-1 Maneuver	726	874		-	-	1392	-
Mov Cap-2 Maneuver	726	-	N.	-	-	41. Sec	-
Stage 1	860	-			-	-	-
Stage 2	931	-	192 <u>-2</u> 29	-	-	-	-
No. The second se					1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.		
Approach	WB	通知時の相比にの	1963	NB	11.0	SB	1-1-1-51
HCM Control Delay, s	10			0		0.1	
HCM LOS	В	- In instead					
Minos Lane/Major Mymt	NBT	NBRWBLn1	SBL	SBT	311112	21. 2002 150	
Canacity (veh/h)		- 734	1392				
		0.000	0.004				121111

HCM Lane V/C Ratio		-	0.022	0.001	-	
HCM Control Delay (s)	•	•	10	7.6	0	
HCM Lane LOS		-	В	Α	Α	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

#### Intersection 1.4

Int Delay,	s/ven
------------	-------

	0.01		and the state of the	13.C				_
Movement	WBL	WBR	NBT	NBR	SBL	SBT		1999
Vol, veh/h	34	2	106	12	1	117		
Conflicting Peds, #/hr	0	0	0	0	0	0		
Sign Control	Stop	Stop	Free	Free	Free	Free		
RT Channelized	-	None		None	-	None		12-51
Storage Length	0	-	-	-	-	-		
Veh in Median Storage, #	0	-	0	-	-	0		
Grade, %	0	-	0		-	0	In the manufacture of the second	
Peak Hour Factor	92	92	92	92	92	92		
Heavy Vehicles, %	2	2	2	2	2	2		S.L.S.
Mvmt Flow	37	2	115	13	1	127		1.111-11
the second se								

Major/Minor	Minor1		Majori	Alex MA	Major2	N. Barris	Contraction of the second
Conflicting Flow All	251	122	0	0	128	0	
Stage 1	122	-	•		-	-	
Stage 2	129	-	-	-	-		
Critical Hdwy	6.42	6.22		-	4.12	-	
Critical Hdwy Stg 1	5.42	-	-	-	-	-	
Critical Hdwy Stg 2	5.42	•	-		-	-	
Follow-up Hdwy	3.518	3.318	27 I S S S S S S	-	2.218	-	
Pot Cap-1 Maneuver	738	929		-	1458	-	
Stage 1	903		811 (D.) E. 2+1	-		-	And the second second
Stage 2	897	-	•	-	-	•	
Platoon blocked, %	10.18. V.S		-	-		. <b>-</b> 10	
Mov Cap-1 Maneuver	737	929		-	1458	-	
Mov Cap-2 Maneuver	737	-	-	-	-	-	
Stage 1	903	-		- 10	-	-	
Stage 2	896	-		-	The second	-	

Approach	WB	NB	SB	
HCM Control Delay, s	10.1	0	0.1	
HCM LOS	В			I See Land Land Sector Se

Minor Lane/Major Mvmt	NBT	NBRV	VBLn1	SBL	SBT	
Capacity (veh/h)		•	746	1458	-	
HCM Lane V/C Ratio	-	-	0.052	0.001	-	NAS TRANSPORTATION AND A DESCRIPTION OF A D
HCM Control Delay (s)	-	-	10.1	7.5	0	
HCM Lane LOS	-	-	В	Α	Α	
HCM 95th %tile Q(veh)		•	0.2	0		

Attachment 9

Intersection	
Int Delay, s/veh	0.8

		and the	ALL STREET		AND AND AND	- 38 M M	
Movement	WBL	WBR	NBT	NBR	SBL	SBT	10 8 16 B
Vol, veh/h	22	1	167	37	2	97	38. E N.)
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None		None		None	
Storage Length	0	-	-		-	-	
Veh in Median Storage, #	0	-	0	-	-	0	
Grade, %	0	The state	0	-	-	0	
Peak Hour Factor	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	24	1	182	40	2	105	
Major/Minor	Minora		Major1		Major2	125,603	No.
Conflicting Flow All	312	202	0	0	222	0	
Stage 1	202		-	-	= 17.		
Stage 2	110	Service 1	-	-	-	-	
Critical Hdwy	6.42	6.22	-	<u>a</u>	4.12	-	
Critical Hdwy Stg 1	5.42	-	San Anna		-	-	
Critical Hdwy Stg 2	5.42	-	-			•	
Follow-up Hdwy	3.518	3.318		-	2.218	-	A CONTRACT
Pot Cap-1 Maneuver	681	839		-	1347	-	
Stage 1	832		- 1000	- 60	-		

Otage I	002						
Stage 2	915		•		-	-	
Platoon blocked, %			-	-		). <b>#</b> (0=)	
Mov Cap-1 Maneuver	680	839	-		1347		
Mov Cap-2 Maneuver	680	-	-		-	-	
Stage 1	832	-	-	-	-	-	
Stage 2	913	-	-	-	-	-	

Approach	WB	NB	SB	
HCM Control Delay, s	10.4	0	0.2	
HCM LOS	В	MAD STREET		

Minor Lane/Major Mvmt	NBT	NBR	<b>NBLn1</b>	SBL	SBT	
Capacity (veh/h)	•	-	686	1347	-	
HCM Lane V/C Ratio	-	-	0.036	0.002		
HCM Control Delay (s)		•	10.4	7.7	0	
HCM Lane LOS		-	В	Α	Α	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Intersection	1-350 EEG #			and and the				A NUMBER OF STREET, ST	120 126
Int Delay, s/veh	3.4								
		and the second	2.23	100 A.M.	100	- Charles Carden	all and the second		
Movement	WBL	WBR		NBT	NBR	SBL	SBT	the second second	1
Vol veh/h	95	21	-	97	159	49	131		
Conflicting Peds #/hr	0	0		0	0	0	0		
Sian Control	Stop	Stop		Free	Free	Free	Free		
RT Channelized	-	None		-	None		None		All Property in the second
Storage Length	0	-		-	-	-	-	OTA	
Veh in Median Storage, #	0	-		0	-	-	0		
Grade. %	0			0	-	-	0	CHICK CONTRACTOR PRODUCTION	
Peak Hour Factor	92	92		92	92	92	92		and the second
Heavy Vehicles. %	2	2	-	2	2	2	2		X 12 1
Mymt Flow	103	23		105	173	53	142		
			100			1		A REAL PROPERTY.	130 80
MalaidMinon	Man			Materi	-	Maior2			
Major/Minor	IVIIIOFI	400		Majori	0	1712 070	0		-
Conflicting Flow All	441	192	a stand	U	U	2/8	U		
Stage 1	192	-	_	-	-		-		10 S.I. (0)
Stage 2	249	-		•	-	-	-		SHSH43
Critical Howy	0.42	6.22		-	-	4.12	-		
Critical Howy Stg 1	0.42		al and a second	-	-	-	-		10.00-2010
Critical Howy Stg 2	0.42	-			-	-	-		
Follow-up Hdwy	3,518	3.318		-	•	2.218	-		and the second s
Pot Cap-1 Maneuver	5/4	850		-	-	1285	•		
Stage 1	841	- 10 - 10 - <b>-</b>	193 - L.	-	-	-	•		
Stage 2	792				•	-	•		
Platoon blocked, %			· •		-	1000	-	and the second second	Chick C And
Mov Cap-1 Maneuver	548	850			-	1285	-		
Mov Cap-2 Maneuver	548		1000	-	-	1.12.5	-		Sector States
Stage 1	841	-		-	-	-	-		
Stage 2	756	-		and the stand of	-		-		
A	14.075			ND		00	Contra Contra		
Approach	WB		563-11	NB		38	St. Art.	and the second second	
HCM Control Delay, s	12.8			U		2.2	in .		
HCM LOS	8	and the second			- ner			Constant instant of Sec. 2	
Minor Lane/Major Mumt	NRT	NBRWBI n1	SBI	SBT	SEN AN		No. Contra		100 M 100 M 100
Canacity (veh/h)	116/1	586	1285		-				
HCM Lana V/C Datio	-	- 0.016	0.041		the state		- Vice		
HCM Control Delay (e)	and the second se	- 0.210	7.0	0					
HCM Lang LOS	-	- 12.0	1.5	Δ	The second	1. C. S. C.	-		
	A REAL PROPERTY AND IN THE REAL PROPERTY AND INTERPOPERTY AND INTE	- D	A	~					

HCM 95th %tile Q(veh)

-

-

0.8

0.1

•

Attachment 9

#### Intersection Int Delay, s/veh 4.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT	States and the states of the s
Vol, veh/h	124	58	146	115	37	119	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None		None	-	None	
Storage Length	0	-	-		-	-	
Veh in Median Storage, #	0	-	0	-	-	0	
Grade, %	0	-	0	-	-	0	Sec. 2.
Peak Hour Factor	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	14 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Mymt Flow	135	63	159	125	40	129	

Major/Minor	Minor1		Major1		Major2	(	TRACE AND DESIGNATION	THE
Conflicting Flow All	431	221	0	0	284	0		
Stage 1	221	-	-	-	-	-		
Stage 2	210		-	-	-	-		-
Critical Hdwy	6.42	6.22	•	-	4.12	•		
Critical Hdwy Stg 1	5.42	-	-	-	-	-		1000
Critical Hdwy Stg 2	5.42		•	-	-	•		
Follow-up Hdwy	3.518	3.318	-		2.218	-	A CHARLEN WAR	1
Pot Cap-1 Maneuver	581	819		-	1278			
Stage 1	816	-	(117) C (23 <b>-</b>	-		-		
Stage 2	825	•		-	-	-		
Platoon blocked, %	1		-	-		-	and the second	10 %
Mov Cap-1 Maneuver	561	819	-	-	1278			
Mov Cap-2 Maneuver	561	-			-	=		1
Stage 1	816	•	-	-	-	-		
Stage 2	797	-	-	-		) <b>-</b> 191	Contraction of the second	200

Approach	WB	NB	SB	
HCM Control Delay, s	13.4	0	1.9	
HCM LOS	В			

Minor Lane/Major Mvmt	NBT	NBRW	/BLn1	SBL	SBT	
Capacity (veh/h)	-	-	624	1278	-	43.574792 44 -
HCM Lane V/C Ratio	-	-	0.317	0.031		
HCM Control Delay (s)	-	-	13.4	7.9	0	
HCM Lane LOS		-	В	Α	Α	
HCM 95th %tile Q(veh)		•	1.4	0.1	-	

SBR

Free - None

. ---\_ ---. -. -

.

19

5

1

-

-

92

2

21

0

and the second in	10010	1- 3/12	State San San	and the second	and the state	a chest and the	Lotte L	a state of the	State of the state of the	10000
3.2	100				- 1/	1			- 25172	20.2
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
45	0	55	5	0	17	21	259	27	36	235
5	0	21	17	0	1	21	0	17	1	0
Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free
		None		-	None		-	None	-	-
-	-	-	-	-	-	-	-			-
¢ -	0	-	-	0	-	-	0	-		0
	0		-	0	-	-	0			0
92	92	92	92	92	92	92	92	92	92	92
2	2	2	2	2	2	2	2	2	2	2
49	0	60	5	0	18	23	282	29	39	255
Minor2	Na Oli	NUESIO	Minor1		CONTRACTOR OF	Major1	2501	N 71 79 1244	Majpr2	02121
733	739	308	754	734	318	297	0	0	328	0
365	365	-	359	359	-	-	-		-	-
368	374	-	395	375		-	-	-	-	-
7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-
6.12	5.52	-	6.12	5.52	-	-	-	-	-	-
6.12	5.52	-	6.12	5.52	-		-	-	•	-
3.518	4.018	3.318	3.518	4.018	3.318	2.218	-		2.218	-
336	345	732	326	347	723	1264	•	· · ·	1232	•
654	623	-	659	627	-	-	-	-	-	-
652	618		630	617	-			-		-
							-	-		-
306	314	707	276	316	710	1242	-	-	1227	-
306	314	-	276	316		-	-	-	-	-
628	589	•	635	605	-	-	-	1.787	10000	-
	3.2 EBL 45 5 Stop - - - - - - - - - - - - - - - - - - -	3.2 EBL EBT 45 0 5 0 Stop Stop        -	3.2    EBL  EBT  EBR    45  0  55    5  0  21    Stop  Stop  Stop    -  -  None    -  -  None    -  0  -    92  92  92    2  2  2    49  0  60    Minor2	3.2    EBL  EBT  EBR  WBL    45  0  55  5    5  0  21  17    Stop  Stop  Stop  Stop    -  -  -  -    -  0  -  -    -  0  -  -    92  92  92  92    2  2  2  2    49  0  60  5    Minor2  Minor1  Minor1    733  739  308  754    365  365  -  359    368  374  -  395    7.12  6.52  6.22  7.12    6.12  5.52  -  6.12    3.518  4.018  3.318  3.518    336  345  732  326    654  623  -  659    652  618  -  630    306  314  707  276    306  314 <td< td=""><td>3.2      EBL    EBT    EBR    WBL    WBT      45    0    55    5    0      5    0    21    17    0      Stop    Stop    Stop    Stop    Stop      -    -    -    -    -      -    -    -    -    -      -    0    -    -    0      -    0    -    -    0      92    92    92    92    92    92      2    2    2    2    2    2    2      49    0    60    5    0      Minor1    Xiai    Xiai    Xiai    Xiai      733    739    308    754    734      365    365    359    359    359      368    374    -    395    375      7.12    6.52    6.22    7.12    6.52      6.12&lt;</td><td>3.2      EBL    EBT    EBR    WBL    WBT    WBR      45    0    55    5    0    17      5    0    21    17    0    1      Stop    Stop    Stop    Stop    Stop    Stop      -    -    -    -    -    None      -    -    -    -    -    None      -    -    -    -    0    -      -    0    -    -    0    -      -    0    -    -    0    -      -    0    -    -    0    -      -    0    -    -    0    -      -    0    60    5    0    18      Minor1    -    -    -    -    -      733    739    308    754    734    318      365    365    -</td><td>3.2    EBL    EBT    EBR    WBL    WBT    WBR    NBL      45    0    55    5    0    17    21      5    0    21    17    0    1    21      Stop    Stop    Stop    Stop    Stop    Stop    Free      -    -    -    -    -    0    -    -      -    0    -    -    0    -    -    -      92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92</td><td>3.2      EBL    EBT    EBR    WBL    WBT    WBR    NBL    NBT      45    0    55    5    0    17    21    259      5    0    21    17    0    1    21    0      Stop    Stop    Stop    Stop    Stop    Stop    Free    Free      -    -    -    -    -    -    -    -      -    0    -    -    0    -    -    0      -    0    -    -    0    -    -    0      -    0    -    -    0    -    -    0      -    0    -    -    0    -    -    0      -    0    -    -    0    -    -    0      -    0    60    5    0    18    23    282      Minor1    Minor1</td><td>3.2      EBL    EBT    EBR    WBL    WBT    WBR    NBL    NBT    NBR      45    0    55    5    0    17    21    259    27      5    0    21    17    0    1    21    0    17      Stop    <t< td=""><td>3.2    EBL    EBT    EBR    WBL    WBT    WBR    NBL    NBT    NBR    SBL      45    0    55    5    0    17    21    259    27    36      5    0    21    17    0    1    21    0    17    1      Stop    Stop    Stop    Stop    Stop    Stop    Free    F</td></t<></td></td<>	3.2      EBL    EBT    EBR    WBL    WBT      45    0    55    5    0      5    0    21    17    0      Stop    Stop    Stop    Stop    Stop      -    -    -    -    -      -    -    -    -    -      -    0    -    -    0      -    0    -    -    0      92    92    92    92    92    92      2    2    2    2    2    2    2      49    0    60    5    0      Minor1    Xiai    Xiai    Xiai    Xiai      733    739    308    754    734      365    365    359    359    359      368    374    -    395    375      7.12    6.52    6.22    7.12    6.52      6.12<	3.2      EBL    EBT    EBR    WBL    WBT    WBR      45    0    55    5    0    17      5    0    21    17    0    1      Stop    Stop    Stop    Stop    Stop    Stop      -    -    -    -    -    None      -    -    -    -    -    None      -    -    -    -    0    -      -    0    -    -    0    -      -    0    -    -    0    -      -    0    -    -    0    -      -    0    -    -    0    -      -    0    60    5    0    18      Minor1    -    -    -    -    -      733    739    308    754    734    318      365    365    -	3.2    EBL    EBT    EBR    WBL    WBT    WBR    NBL      45    0    55    5    0    17    21      5    0    21    17    0    1    21      Stop    Stop    Stop    Stop    Stop    Stop    Free      -    -    -    -    -    0    -    -      -    0    -    -    0    -    -    -      92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92    92	3.2      EBL    EBT    EBR    WBL    WBT    WBR    NBL    NBT      45    0    55    5    0    17    21    259      5    0    21    17    0    1    21    0      Stop    Stop    Stop    Stop    Stop    Stop    Free    Free      -    -    -    -    -    -    -    -      -    0    -    -    0    -    -    0      -    0    -    -    0    -    -    0      -    0    -    -    0    -    -    0      -    0    -    -    0    -    -    0      -    0    -    -    0    -    -    0      -    0    60    5    0    18    23    282      Minor1    Minor1	3.2      EBL    EBT    EBR    WBL    WBT    WBR    NBL    NBT    NBR      45    0    55    5    0    17    21    259    27      5    0    21    17    0    1    21    0    17      Stop    Stop <t< td=""><td>3.2    EBL    EBT    EBR    WBL    WBT    WBR    NBL    NBT    NBR    SBL      45    0    55    5    0    17    21    259    27    36      5    0    21    17    0    1    21    0    17    1      Stop    Stop    Stop    Stop    Stop    Stop    Free    F</td></t<>	3.2    EBL    EBT    EBR    WBL    WBT    WBR    NBL    NBT    NBR    SBL      45    0    55    5    0    17    21    259    27    36      5    0    21    17    0    1    21    0    17    1      Stop    Stop    Stop    Stop    Stop    Stop    Free    F

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.7	12.2	0.5	1
HCM LOS	C	В		

583

.

-

.

545

Minor Lane/Major Mymt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR	
Capacity (veh/h)	1242	-	-	445	523	1227	-	-	34 <sub>72</sub>
HCM Lane V/C Ratio	0.018	-		0.244	0.046	0.032	-	-	
HCM Control Delay (s)	8	0		15.7	12.2	8	0	-	
HCM Lane LOS	A	A	-	С	В	Α	A	104	
HCM 95th %tile Q(veh)	0.1	-		0.9	0.1	0.1	-	-	

618

596

.

Stage 2

2roj # 009370-03-001 6/13/2016

Intersection	passed - us			123-233	1000	at he will	The second		11 2-	S. States	12, 12, 18,	1. C. L.	200
Int Delay, s/veh	2.4												
Mauamant	EDI	COT	EDD		14/201	WRT	WED	NBI	NBT	NRR	SBI	SBT	SBD
Movement	24		200	a property	19DL 40	0	0	1100	220	10	17	320	86
Vol, venin Confliction Dade #the	31	0	20		20	0	0	44	230	20	07	329	00
Connicung Peas, #/nr	Cion	Clan	Cian		Cion	Stop	Stop	Eree	Eree	Eree	Eroo	Froo	Eree
Sign Control	Stop	Stoh	None		Stop	Stop	None	1100	1100	None	1100	1100	None
RT Grannenzeu Storogo Lopoth			NULLE				INUTIC			NUNC		-	TNUTIC
Voh in Median Storage #		-				0			Ð	-		0	
Grado %		0	and the second s	52.65		0 0	-		0		172.124	0	
Book Hour Easter	02	02	02		02	92	92	92	92	92	92	92	92
Hogar Vehicles %	52	32	2		2	2	2	2	2	2	2	2	2
Mymt Flow	34	0	28	1.15-5411 1-	13	0	9	48	250	11	18	358	93
			1			(SAL)		11-1-4	-		Mainto		-
Major/Minor	Minor2			a depict	MINOFI			Majori	2		Majprz		
Conflicting Flow All	850	852	458		860	893	321	466	0	0	300	0	0
Stage 1	456	456	-		390	390	-	-	-	-			-
Stage 2	394	396	-		470	503	-	-	-	-	-	and an a	
Critical Hdwy	7.12	6.52	6.22		7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	26.5	6.12	5.52	-	-	-	-		•	-
Critical Hdwy Stg 2	6.12	5.52	-		6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	4.1	3.518	4.018	3.318	2.218	-	-	2,218	-	-
Pot Cap-1 Maneuver	280	297	603		276	281	720	1095		-	1261		-
Stage 1	584	568	-		634	608	-	-	-			-	
Stage 2	631	604	-		5/4	541	-	-	-		-		-
Platoon blocked, %				12120		0.40	004	4050	-		4000	-	-
Mov Cap-1 Maneuver	252	263	576		232	249	681	1059	-		1233	•	
Mov Cap-2 Maneuver	252	263		1998 B. C.	232	249	-		111 3 20	-	•	•	-
Stage 1	546	550	-		581	557	-	-	•	000 <b>-</b> 000		-	
Stage 2	577	553	-		518	524	-	-	-	-		•	
Approach	EB		STR. N	Series 1	WB		Sing -	NB			SB		
HCM Control Delay, s	18				17.3			1.3			0.3		
HCM LOS	C			1	С			TREES IS THE			14 Walt		
Minor Lane/Mainr Mymt	NBI	NBT	NBR	EBL n1	NBL nfl	SBI	SBT	SBR	Second Second		an Isenna	S. MIN LO	
Capacity (yeh/h)	1050	a - 4 0er : 1		330	315	1233							
HCM Lane V/C Ratio	0.015	33.2		0 183	0.069	0.015		-	1 with	a large and the		1.0	2352620
HCM Control Delay (e)	8.8	0	-	18	17.3	8	0	-	the other states	and the second second			and the second second
HCM Lane LOS	Δ	Δ		C	C.	Δ	Δ	-	Transla.	ny and a star	1000 C	- 25-	
HCM 95th %tile O(veh)	01	-		0.7	0.2	0	-	-			the summer of the later.		
crom sour sourced active	0.1	-		0.1	<b>U.L</b>	•							

Attachment 9 Page 103 of 113

# HCM Unsignalized Intersection Capacity Analysis 5: Eustace Road & Hampton Park Road/Northampton Blvd

	≯	>	$\rightarrow$	-	4		1	1	1	1	↓ .	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	4Î		ሻ	4			र्स	7	ሻ	4	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	46	219	8	51	345	106	6	92	45	116	163	74
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	238	9	55	375	115	7	100	49	126	177	80
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	S. College	a capacita	S. Mark	2-3
Volume Total (vph)	50	247	55	490	107	49	126	258				
Volume Left (vph)	50	0	55	0	7	0	126	0		2100.252.06		AND
Volume Right (vph)	0	9	0	115	0	49	0	80				
Hadi (s)	0.53	0.01	0.53	-0.13	0.06	-0.67	0.53	-0.18				
Departure Headway (s)	7.7	7.2	7.3	6.6	7.9	7.1	7.8	7.1				S
Degree Utilization, x	0.11	0.49	0.11	0.90	0.23	0.10	0.27	0.51				1 diate
Capacity (veh/h)	443	472	475	535	434	472	440	486				
Control Delay (s)	10.4	15.7	10.0	43.3	12.0	9.7	12.6	16.1				
Approach Delay (s)	14.8		39.9		11.3		14.9					
Approach LOS	В		E	10.00	В		В			College i	The second	
Intersection Summary	N VALSING				1.	Carly 1	2019-1-1-	No. M. NELO	T.YPANT	13923-	S. 2. 2. 6	
Delay			24.4	8 34	5.5				N. Har			
Level of Service			С									
Intersection Capacity Utilization			51.0%	Ю	U Level o	of Service		22-34N	Α			
Analysis Period (min)			15			-1898) - 10 - 1998 - 10						and the local division of

Attachment 9 Page 104 of 113

### HCM Unsignalized Intersection Capacity Analysis 5: Eustace Road & Hampton Park Road/Northampton Blvd

	٦	-	$\mathbf{r}$	4	-	×.	-	1	1	1	Ļ	-
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	1		٢	<b>₽</b>			र्भ	1	۲	ĥ	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	109	168	5	40	130	68	2	175	50	50	76	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	118	183	5	43	141	74	2	190	54	54	83	36
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	<b>SB</b> 1	SB 2	138. V.A.	2.XC3		1221
Volume Total (vph)	118	188	43	215	192	54	54	118				
Volume Left (vph)	118	0	43	0	2	0	54	0	100 Barris		Marie at	1
Volume Right (vph)	0	5	0	74	0	54	0	36				
Hadj (s)	0.53	0.01	0.53	-0.21	0.04	-0.67	0.53	-0.18	ALCONTRACT.			Sector Sector
Departure Headway (s)	6.6	6.1	6.7	6.0	6.4	5.6	7.0	6.2				
Degree Utilization, x	0.22	0.32	0.08	0.36	0.34	0.09	0.11	0.21				1012
Capacity (veh/h)	515	562	507	574	536	593	481	536				
Control Delay (s)	10.2	10.7	9.1	11.0	11.4	8.0	9.6	9.7				
Approach Delay (s)	10.5		10.7		10.6		9,6					
Approach LOS	В		В	1.2.	В	28 S 2	Α	11.14		Sa has		
Intersection Summary		and the second		12.3.4/12	12 11	1000				1.5.3	130.55	
Delay	VAUS N.	23 115	10.4						1. 19			- 56
Level of Service			В									
Intersection Capacity Utilizati	on		45.7%	IC	U Level o	of Service			A	7.0 H.S.		
Analysis Period (min)	-		15									

#### Intersection: 1: Winding Creek Road & Site Entrance

Movement	WB	and a summary state of the second
Directions Served	LR	
Maximum Queue (ft)	29	
Average Queue (ft)	17	
95th Queue (ft)	40	
Link Distance (ft)	1263	
Upstream Blk Time (%)	and the second second	
Queuing Penalty (veh)		
Storage Bay Dist (ft)	The second s	
Storage Blk Time (%)		
Queuing Penalty (veh)	States and the	

#### Intersection: 2: Winding Creek Road & Site Entrance 2

Movement	WB	
Directions Served	LR	
Maximum Queue (ft)	100	
Average Queue (ft)	52	
95th Queue (ft)	110	
Link Distance (ft)	340	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)	and the second	

#### Intersection: 3: Winding Creek Road & Embrey Mill Road

Movement	WB	SB	
Directions Served	LR	LT	
Maximum Queue (ft)	22	32	
Average Queue (ft)	22	6	
95th Queue (ft)	23	27	
Link Distance (ft)	2104	277	
Upstream Blk Time (%)	DESIDENS		
Queuing Penalty (veh)			
Storage Bay Dist (ft)		11010	
Storage Blk Time (%)	and the part of the second second		
Queuing Penalty (veh)			

6/13/2016

#### Intersection: 4: Eustace Road & Live Oak Lane/Middle School Ent.

Movement	EB	WB	NB	
Directions Served	LTR	LTR	LTR	
Maximum Queue (ft)	78	28	67	
Average Queue (ft)	52	16	25	
95th Queue (ft)	83	39	76	
Link Distance (ft)	2047	169	2338	
Upstream Blk Time (%)	- 1. J N/			
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)		The second	12-1-10	

#### Intersection: 5: Eustace Road & Hampton Park Road/Northampton Blvd

Movement	EB	ÆB	WB	WB	NB	NB	SB	SB		-
Directions Served	L	TR	L	TR	LT	R	L	TR		
Maximum Queue (ft)	50	48	24	66	47	53	27	71	Non-Asia	Survey 1
Average Queue (ft)	32	34	19	53	29	22	16	38		
95th Queue (ft)	47	52	35	70	44	55	38	65	1.2	111100
Link Distance (ft)		1559		1206	617			912		
Upstream Blk Time (%)			1	P. S. S. S.	1.1.2.3	Trans.		2 - L. A.L.		
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150		340			200	250			
Storage Blk Time (%)										
Queuing Penalty (veh)	12/1/2	1000.00		1. 21 35	MB Lab	- ALCONT	100			

#### Zone Summary

Zone wide Queuing Penalty: 0

#### Intersection: 1: Winding Creek Road & Site Entrance

Movement	WB		and the second	a series and the series of the				ARRAY BASSAR
Directions Served	LR		1					
Maximum Queue (ft)	25	and the second second			-341	-ST 183		
Average Queue (ft)	15			11 N				
95th Queue (ft)	35					'yên lît	The second se	
Link Distance (ft)	1435							
Upstream Blk Time (%)			1.8			IN STATE	- C	
Queuing Penalty (veh)				 				
Storage Bay Dist (ft)							- 10 S.	
Storage Blk Time (%)						The street		
Queuing Penalty (veh)	and the second	- La portes	and the second	्र मध्यम् ।	11211194	10000		C CALLER S S

#### Intersection: 2: Winding Creek Road & Site Entrance 2

Movement	WB	
Directions Served	LR	
Maximum Queue (ft)	30	
Average Queue (ft)	12	
95th Queue (ft)	36	
Link Distance (ft)	251	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

# Intersection: 3: Winding Creek Road & Embrey Mill Road

Movement	WB	
Directions Served	LR	
Maximum Queue (ft)	88	
Average Queue (ft)	58	
95th Queue (ft)	86	
Link Distance (ft)	2104	
Upstream Blk Time (%)	the specific	
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

#### Intersection: 4: Eustace Road & Live Oak Lane/Middle School Ent.

Movement	EB	WB	NB	SB	
Directions Served	LTR	LTR	LTR	LTR	
Maximum Queue (ft)	55	50	27	68	
Average Queue (ft)	45	10	16	27	
95th Queue (ft)	63	43	38	70	
Link Distance (ft)	2047	169	2338	3516	
Upstream Blk Time (%)	3 11722	12. S.		10-10	
Queuing Penalty (veh)					
Storage Bay Dist (ft)			2013.0	2282	
Storage Blk Time (%)					
Queuing Penalty (veh)	Here The				

#### Intersection: 5: Eustace Road & Hampton Park Road/Northampton Blvd

Movement	EB	EB	WB	WB	NB	NB	SB	SB	
Directions Served	L	TR	L	TR	LT	R	L	TR	
Maximum Queue (ft)	27	73	24	125	25	69	49	73	
Average Queue (ft)	16	53	24	92	20	35	44	62	
95th Queue (ft)	38	69	24	132	36	73	58	76	State of the state
Link Distance (ft)		1559		1206	617			912	
Upstream Blk Time (%)	The Sty	Lamb		12, 22			and the second		
Queuing Penalty (veh)		The second contract							
Storage Bay Dist (ft)	150		340	an Treas		200	250		
Storage Blk Time (%)									
Queuing Penalty (veh)	1000	e nar	TINE		in strady			1000	Sale States

#### Zone Summary

Zone wide Queuing Penalty: 0

# APPENDIX H TURN LANE WARRANT ANALYSIS





Intersection:Winding Creek Road/Site Entrance #1 (Study Intersection #1)Approach:Northbound RightScenario:Total Future 2021Speed Limit:35 mph

	AM Peak Hour	PM Peak Hour
Approaching Volume	118	204
Right Turns	12	37
Right Turn Adjustment:	No	No
Adjusted Right Turns:	N/A	N/A

WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAYS



Intersection: Winding Creek Road/Site Entrance #1 (Study Intersection #1) Approach: Southbound Left Scenario: Total Future 2021

	AM Peak Hour	PM Peak Hour
VO, Opposing Volume	108	168
VA, Advancing Volume	96	84
VL, Left Turning Volume	0	1
Percent Left Turns	0.0%	1.2%
Symbol		•



Intersection:Winding Creek Road/Site Entrance #2 (Study Intersection #2)Approach:Northbound RightScenario:Total Future 2021Speed Limit:35 mph

	AM Peak Hour	PM Peak Hour
Approaching Volume	119	207
Right Turns	14	45
Right Turn Adjustment:	No	Yes
Adjusted Right Turns:	N/A	25

# WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAYS



Intersection: Winding Creek Road/Site Entrance #2 (Study Intersection #2) Approach: Southbound Left Scenario: Total Future 2021

	AM Peak Hour	PM Peak Hour
VO, Opposing Volume	118	204
VA, Advancing Volume	113	94
VL, Left Turning Volume	1	2
Percent Left Turns	0.9%	2.1%
Symbol		•

Attachment 10 Page 1 of 34

Market and Fiscal Impacts Analyses Winding Creek Subdivision Stafford, Virginia

**Prepared for:** 

Mr. Frank X. Lackman Winding Creek Owners, LLC

May, 2014

S. Patz and Associates, Inc. 46175 Westlake Drive, Suite 400 Potomac Falls, Virginia 20165



May 13, 2014

Mr. Frank X. Lackman, Member Winding Creek Owners, LLC 15256 Welton Court Centreville, Virginia 20120

Dear Mr. Lackman:

This will set forth our market study and fiscal impacts analysis of the proposed 97-lot subdivision, Winding Creek, to be built on a vacant and fully wooded parcel located on Winding Creek Road, just north of Embrey Mills Road and along the evolving housing market area along the Courthouse Road corridor. The subdivision is expected to have finished lots available for home construction by late-2016 or early-2017. Homes are expected to average \$525,000 per contract price.

The following chart summarizes the net fiscal benefit to the County at project build out. The net fiscal benefit includes total on-site and off-site projected revenues minus the costs calculated for the County to serve the 97 new families and true public school children that will be generated from the new homes.

Total Fiscal Impacts	<u>On-site</u>	Off-site	<u>Total</u>
Total Tax Revenue	\$754,890	\$421,280	\$1,176,170
Tax-supportable Costs	<u>-\$669,770</u>	<u>-\$149,010</u>	<u>-\$818,780</u>
Net Fiscal Benefit	\$85,120	\$272,270	\$357,390

The net fiscal benefit shown above is based on an expected pupil generation ratio of 1.06 public students per household. The report conclusions also show alternative fiscal impacts with two other per household pupil totals. Two of the three alternative calculations generate sizable net benefits for the County. One is a more "break even" scenario.

The detailed market and financial data prepared for this analysis are presented in the attached report. Please call if additional data or clarification are needed.

46175 Westlake Drive = Suite 400 = Potomac Falls, Virginia 20165 = 703.421.8101 = 703.421.8109 fax = spatzec@comcast.net
Attachment 10 Page 3 of 34

Mr. Frank X. Lackman May 13, 2014

Sincerely,

Ceaus Mat at  $\triangleleft$ 

Stuart M. Patz President

SMP/mes

## TABLE OF CONTENTS

# PAGE

Introduction Site Description Site Setting General Development Plan	5 8 10
Overview Market Analysis	12
Projected Single Family Home Sales	13
Market Analysis Conclusions	17
Detailed Fiscal and Economic Impact Analysis	18
Summary of Fiscal Impacts	18
On-Site Impacts: Tax Revenues	19
Real Property Tax	19
Personal Property Taxes	20
Consumer Utility Taxes	22
Motor Vehicle License Fees	23
Recordation Tax	23
Summary of Tax Revenues	23
On-Site Costs to Stafford County	23
County Budgeting Expenditures	24
Tax-Supported County Costs	25
Per Capita County Costs	26
On-Site Costs to the County	27
Net Fiscal Impact On-Site	28
Off-Site Impacts: Economic and Fiscal	29
Business Receipts	30
Employment and Earnings	30
Off-Site Fiscal Impacts	30
Total Fiscal Impacts Alternative Fiscal Impacts	32 33

### **Introduction**

Following is our overview market study and fiscal impacts analysis for the 97-lot subdivision proposal, Winding Creek, which is located off of Courthouse Road (Route 630) in the Mountain View section of Stafford County, which is west of I-95 and along the developing Courthouse Road corridor. The site is located along Winding Creek Road, north of Route 630, and just north of the intersection of Winding Creek Road and Embrey Mill Road. (see Map A).



Map A - Winding Creek Site Setting

The site is vacant and heavily wooded. It is located along an undeveloped section of Winding Creek, a two-lane rural roadway, but has excellent access to I-95 via Winding Creek Road south and Courthouse Road east. To the north, Winding Creek Road intersects with Shelton Shop Road; Shelton Shop Road runs northeast to Route 610, Garrisonville Road, which is also a intersecting arterial road with I-95. Garrisonville Road is also the commercial corridor in Stafford County with several shopping centers, medical office space, and big box retail stores. Access, via Route 641 north (Orville Road) off of Garrisonville Road is a direct entrance into Quantico Marine Corp Base.

The following aerial shows the site with frontage along Winding Creek Road. The property is north of the Vepco right-of-way. To the west, off of Walpole Street, is the relatively new subdivision of The Greens at Amyclae, with homes priced from the low \$500,000's. The Colonies and Autumn Ridge communities are to the east, off of Embrey Mill Road. The immediate area becomes more dense to the north and east of the Winding Creek site, as the area to the north is Garrisonville which has considerable development dating back to the 1980's.



Following are two photos of the property. Both are views into the site from Winding Creek Road. The site includes a small area on the west side of Winding Creek Road, but the main portion of the site is on the east side. Both photos show the fully treed site.





View of Site on East Side of Winding Creek Road

View of Site on West Side of Winding Creek Road

As noted prior, the site is located in a pastoral section along Winding Creek Road. The photo on the left "looks" south on Winding Creek Road. Winding Creek Road is a two-lane country road. The adjacent parcels are vacant rolling meadowland. On the right, the photo is a view north along Winding Creek Road. This section of Winding Creek Road is fully wooded, also undeveloped, and is treed up to the intersection of Winding Creek Road, Walpole Street and Flatford Road.



View of South Along Winding Creek Road



View North Along Winding Creek Road

## Site Description

The Winding Creek site is a irregular shaped rectangular parcel, as shown below. It is 63.13 (gross) acres in size and zoned A-1 currently. The proposal is to rezone the site to R1 cluster, which will allow 97 single family lots of just under 10,000 square feet per lot and a development density of 1.54 units per acre. Only 20.2 acres of the site is to be developed, with 36.7 acres dedicated to open space.



Site Location - (generalized)

## Site Setting

In addition to the site's excellent highway access, there are two other key issues shown on Map B. First, the Winding Creek site is located in close proximity to three schools. Winding Creek Elementary School is located on Winding Creek Road at its intersection with Courthouse Road. H.H. Poole Middle School is nearby and adjacent to the Autumn Ridge subdivision. Colonial Forge High School fronts on Courthouse Road, a short distance east of Winding Creek Road.

Each number on Map B denotes the location of an active or planned subdivisions. Number two is the location of two adjacent planned subdivisions – Shelton Woods and Shelton Knolls. Shelton Woods is expected to be started later in 2014. The adjacent site, Shelton Knolls, will be started approximately one year later. Number 4 is the location of Liberty Knolls I and II. The first subdivision has started. The second is 1+ years away. Three is Colonial Forest which is active with three single family home builders and Number 5 is the location of the large Embrey Mills, a mixeduse development with multiple home builders. These communities will be described below.

The area along Courthouse Road has no sizable commercial areas. Commercial services are located along Route 610 to the east of the area shown on Map B. Public services are located along Courthouse Road east of I-95. Overall, the Courthouse Road corridor has evolved into an active and successful area for new housing development. The Winding Creek site is equally competitive with all of the current and planned subdivisions.



Map B - Winding Creek Subdivision Setting

## **General Development Plan**

Next shown is the General Development Plan (GDP) for the site. There will be two entrances to the subdivision from Winding Creek Road and the property will be developed with a north-south interior street, which cul-de-sacs on the north and has two other interior streets extending east from the primary development street. One interior road will connect with Fireberry Boulevard into the adjacent The Colonies subdivision. Fireberry Boulevard intersects with Parkway Boulevard. Parkway Boulevard runs north to Garrisonville Road, which is the best alternative route to Route 610 from the site under study. All other interior roads are cul-de-sacs.

None of the proposed 97 homes will front along Winding Creek Road. All have tree buffers along the roadway. The GDP also shows the extensive amount of open space in the plan. There are several locations where a storm water management area could be located. Of note, and shown by a "star", is the area to the west of Winding Creek Road which will not be developed.

Public water is available at the site by a 12" line that runs along Winding Creek Road in front of the property. Public sewer will be provided by a 12" line that exists in an easement that runs across the northern portion of the property.





The sponsor, Winding Creek Owners, LLC, intends to develop the 97 lots and sell finished lots to area home builders. It is likely that one or more of the active home builders, in the County, will be selected and the home prices at Winding Creek will be in line with current sale prices, as described below.

### **Overview Market Analysis**

This part of the report presents an overview market analysis of the active new home market along the Courthouse Road corridor of Stafford County, with the market findings, in terms of home prices and new home sales pace, used for the preparation of the fiscal impacts analysis.

Currently, the Courthouse Road corridor is the County's one primary development area for new home communities. To a lesser extent, new homes have been built along Telegraph Road on the northeast corner of the County, near Aquia Harbour. This area now has one active subdivision and one in active planning. Thus, the market area under study, defined as the Courthouse Road corridor, extending from I-95 on the east to Shelton Shop Road on the west, is the <u>one</u> primary area in Stafford County with multiple new subdivisions.

Within the market area, and including Winding Creek, there are seven active and planned new subdivisions. The analysis to follow will show that all will compete for the expanding for-sale home market in this section of Stafford County. Each is priced comparatively. Data on the seven competitive properties are summarized in Table 1 and are described in more detail in the paragraphs following Table 1.

Table 1 lists the seven subdivisions that are being developed currently or will be placed on the market over the next few years. These communities will add over 800 new single family homes in time (plus towns and condos). Only single family homes are listed in Table 1, as Colonial Forge and Embrey Mills have new towns and condos (at Colonial Forge) for sale. The two larger communities, Colonial Forge and Embrey Mills, are being built in phases and with multiple home builders.

Two of the area subdivisions have been open for one or more years and are actively selling homes. Colonial Forge has 270 <u>single family</u> homes planned out of a total 578 for the planned community. To date, approximately 90 homes are sold there among three homebuilders. Single family home sales started at Colonial Forge in January, 2012. There are also towns and condos being built and marketed at Colonial Forge. Embrey Mills has 298 single family homes planned, but only a part of the lots are available for development at this time. Home sales started at Embrey Mills in Fall, 2013; to date, there are approximately 40 sales among six single family home builders in the community. However, not all home builders started sales in 2013. The Embrey Mills community also has new townhomes for sale.

Thus, of the 800 homes in planning, 130± are now sold. Home construction at Liberty Knolls I has just started. Ryan Homes, the one home builder, has 7 sales to date in two months after opening their model home. Home sales at Shelton Woods, Shelton Knolls, Liberty Knolls II, and at the Fitzhugh site will not start until mid-2015 and after.

**Projected Single Family Home Sales.** The new home sales market within the section of Stafford County under study has "only" been active for less than a two-year period. Colonial Forge, with three home builders, was the first to open. Drees Homes and Beazer Homes opened in early-2012 and each has 25 to nearly 40 home sales to date. Augustine Homes started somewhat after. There are 90 single family home sales at Colonial Forge over approximately 2.0 years. Embrey Mills opened in Fall, 2013 with half of their six single family home builders. Within the past year, over 40 homes have been sold. There has also been considerable townhome sales at Embrey Mills and Colonial Forge over the past few years.

In 2015 and after, the market area should have up to 14 active home builders. This is compared with 10 now. With increased subdivisions and home builders, the annual sales pace for single family homes should increase to 150 to 200 homes per year by 2016. The 150 to 200 annual sales equals about 15 sales per home builder. That is compared with a 12-unit per year sales pace per home builder during the past 1.5 years.

In terms of market support for the 97 homes at Winding Creek, we expect home sales to increase to 100+ per year for the mid-2014 to 2016 period with more active home builders. That will add 250 home sales to the current total of 130. Thus, by 2017, at least half of the 800 lots at active and planned subdivisions would be sold and developed by the time that lots at Winding Creek are delivered. The addition of Winding Creek and the establishment of sales at Liberty Knolls II, Shelton Woods, Shelton Knolls, the Fitzhugh property and Winding Creek should generate a higher new home sales pace by 2017 and after.

The new home market is clearly dependent on low interest rates and has been somewhat cyclical over the past year or so. Otherwise, new home sales along the Courthouse Road corridor would have been larger than the current number. However, the current sales level was 130 home sales in 1.5 years. In 2015 and 2016, three new subdivisions will open and Liberty Knolls I is now "on the market". An increase in annual sales with four new subdivisions will generate an evolving market.

The 800± planned homes shown in Table 1 includes 250 lots at Embrey Mills. To date, and within one year, 30 homes were sold. Richmond American opened in January, 2014 and one or two other homes builders there also just started. It's likely that a larger sales pace will occur with more homes available.

Table 1 also shows the base home price of single family homes being realized at the three active subdivisions and the proposed one's. These are base prices which are typically increased by \$50,000 to \$100,000 for add-ons and upgrades.

Table 1Characteristics of Active and Planned Subdivisions, Courthouse Road West Corridor, May, 2014				
	Number of	<b>Base Sales</b>	Development	
	Homes	Price Range	<u>Status</u>	
Shelton Woods	95	\$500,000-\$550,000	Open Mid-2015	
Shelton Knolls	94	\$500,000-\$550,000	Open Mid-2016	
Liberty Knolls	91	\$460,000-\$550,000	Actively Selling	
Liberty Knolls II	56	\$450,000±	Open Early-2017	
Colonial Forge	170	\$400,000-\$565,000	Actively Selling	
Embry Mills	250	\$400,000-\$600,000	Actively Selling	
Fitzhugh Property	<u>57</u>	\$525,000	Open Mid-2016	
Total	813			
Source: S. Patz & Assoc	Source: S. Patz & Associates Field and Telephone Survey			

Following are brief descriptions of the current active and planned new home market along the Courthouse Road corridor. These descriptions are number-keyed to Map B.

- Shelton Woods (2) is located at the northeast intersection of Courthouse Road and Shelton Shop Road. Richmond American is the designated homebuilder. Land development is expected to start by Summer, 2014 and home sales and construction could start by early-2015. Richmond American has homes priced at \$600,000 at Embrey Mills, as the average contract price for homes with a base price of \$475,000. This is likely the product to be built at Shelton Woods.
- Shelton Knolls (2) is located next to Shelton Woods on the north. Shelton Woods will be accessed from Courthouse Road, but will also be accessed from Shelton Shop Road, via a connecting road into Shelton Woods. Start of home sales at Shelton Knolls is about one-year behind Shelton Woods. No home builder has been identified, but home prices should be similar to Shelton Woods.
- At Liberty Knolls I (4) a model home is now open (see below), and since March, 2014, when the model home was built, seven homes have been sold at prices of \$459,000 to \$700,000, with a \$50,000 to \$100,000 upgrade from the lower base priced homes. All of the site work is finished in the entire community. This property is located on the north side of Courthouse Road across from Colonial Forge High School. Ryan Homes is the homebuilder for the 91 lots planned. The following two photos show the completed site work in the subdivision and the model home being built.



Interior Road – Liberty Knolls I



Model Home - Liberty Knolls I

- On the immediate west of Liberty Knolls is <u>Liberty Knolls II</u> (4). It will be connected to Liberty Knolls I via Penn Charter Lane which is an east-west street running through the two subdivisions. Penn Charter Lane will run through both subdivisions and intersect on Courthouse Road, just to the west of Woodcutter Road. Ryan could be the homebuilder at this property also. If so, development will likely start once the initial phase of home development is well underway. In constant 2014 dollars, the home prices should be similar.
- Home builders at <u>Colonial Forge</u> (3)have been actively marketing new homes for about 2.0 years. There are three home builders for single family homes at this community Augustine Homes, Drees Homes and Beazer Homes. There are 578 homes planned at Colonial Forge with 278 of these homes being single family. The current phase has 170 single family homes. This phase is over 50 percent sold out. It should be fully sold out by year-end 2016 at the current sales pace at the community. Phase II may not start until after 2016, as no site work has been started on the next phase. There are also 200 townhomes and 100 condominium homes currently being marketed at Colonial Forge. Considerable sales have been realized for these units.



Model Homes at Colonial Forge

Embrey Mills (5) is a very new community located north of Route 630 along Austin Ridge Road. It is a 831-acre, master planned site that will have 1,827 homes at completion. These homes will include a mix of single family detached homes and townhomes. Sales at the community started in late-September or early-October of 2013 for some of the home builders.

There are six home builders in the community – Brookfield, Integrity, Richmond American, K Hovnanian, Atlantic Builders, and Miller and Smith. All but Miller and Smith are building singles. The current phase includes about 250 single family lots, with 40± sales to date. The community does have considerable home sales for townhomes. Phase I build-out will likely require several years.

### Market Analysis Conclusions

The two active large subdivisions under study have base home prices that range from \$400,000 to \$600,000, not including add-ons for upgrades. Ryan Homes at Liberty Knolls I has seven sales with a contract average of \$600,000. Liberty Knolls I is a good comp for Winding Creek.

We used an average contract sales price for new homes at Winding Creek of \$525,000 for our fiscal impacts analysis. This may be conservative.

In terms of market support for the 97 new homes to be built at Winding Creek, our analysis shows that current plans for active and planned subdivisions have a total of 800+ single family lots. Of these, 130± have been sold over the past two years. With four new communities to be added to the market in 2015 and 2016, plus sales in the second half of 2014, another 350 to 400 homes are expected to be sold prior to the delivery of lots at Winding Creek. By that time, Colonial Forge will likely be sold out of single family home lots in their initial phase and Embrey Mills will be a fully established community with all home builders fully established. Currently, some home builders at Embrey Mills are just getting started with home sales.

Winding Creek will be priced competitively with the evolving market and is well located. The selected home builder will be fully competitive to capture part of the 150+ annual new home sales in the market area by 2017.

### **Detailed Fiscal and Economic Impact Analysis**

Fiscal and economic impacts for the Winding Creek subdivisions will be treated in two ways: first, those impacts which occur directly from activities on-site at the property; and, second, those impacts which occur off-site due to the multiplier, spin-off or ripple effect of resident expenditures. The off-site impacts will be explained further on in this report; the present section deals with the on-site impacts. These include taxes generated by the development on-site to accrue to the County, such as the real property and personal property taxes.

The fiscal impacts analysis also projects the public service and facility costs to be incurred by Stafford County by development on-site and for off-site spin-off effects. The results of the fiscal impacts analysis will be to compare the tax revenues generated by the property with the tax-supported costs incurred by the County to determine the net fiscal impacts in terms of a revenue surplus or deficit over costs. This is done for both on-site and off-site impacts. Total annual impacts for the property are projected at complete buildout of this phase of the project. Results are given in constant year 2014 dollars, rounded to the nearest ten dollars.

### **Summary of Fiscal Impacts**

The following chart summarizes the on-site and off-site (spin-off) effects that will accrue to Stafford County once the Winding Creek property has been fully built out. The chart shows an eleven percent revenue surplus of \$85,000 in on-site impacts (real estate taxes, population and education costs, etc.) and a net revenue surplus of \$272,000 for off-site spin-off effects (note: see note on chart below). The smaller on-site surplus results from the high cost of educating pupils living in new homes in the County. Overall, this gives a net revenue surplus of \$357,000 annually for the County. The remainder of this report will give the derivation of these figures.

	<u>On Site</u> Impacts	<u>Off-site</u> <u>Impacts</u>	<u>Total</u> <u>Impacts</u>
Total Tax Revenues	\$754,890	\$421,280	\$1,176,170
Less: Tax-supported Costs 1/	<u>-\$669,770</u>	<u>-\$149,010</u>	<u>-\$818,780</u>
Net Fiscal Benefit	\$85,120	\$272,270	\$357,390
Note: 1/ Based on school pupil ge	eneration dates	provided by C	ounty
Commissioner of Reven	ue.		

## **On-site Impacts: Tax Revenues**

Г

The revenues to be considered in this report are taxes collected by Stafford County for General Fund use. These include the property taxes, utility tax, and other smaller taxes. The paragraphs to follow document the derivation of the tax amounts for the on-site development at the property.

**Real Property Tax**. This is a tax on the assessed value of real estate. Homes on the Winding Creek property will average \$525,000, reported in constant 2014 dollars. This average includes the base home price of \$472,500 and add-on options averaging \$52,500. For 97 homes at this price, taxed at the rate of \$1.07 per \$100 of valuation, the total real property tax at the site would be nearly \$545,000 each year, as data in Table 2 shows.

Table 2.Real Estate Taxes for the Winding Creek Property Development at Buildout (constant \$2014)			
	<u>Amount</u>		
Number of Homes	97		
Average Value Per Home	\$525,000		
Total Market Value\$50,925,000			
Tax Rate/\$100 1.07			
Real Estate Tax	\$544,900		
Sources: Winding Creek Own	ners, LLC and		
S. Patz & Associates	s., Inc.		

**Personal Property Taxes**. Residences are assessed personal property taxes. For residents, this is a tax on motor vehicles. To address residential personal property taxes, the first step is to estimate the average depreciated value per vehicle in the County. The sequence of calculation to achieve this is shown in Table 3 and summarized as follows:

- The FY 2014 Adopted Budget for Stafford County gives an allocation of \$45.4 million for expected personal property taxes.
- Based on the percent of real estate assessments that are residential 75 percent it is estimated that residential personal property taxes are \$34.0 million.
- To this base is added the amount of Personal Property Tax Relief Act (PPTRA) funding the County is expected to receive from the State of Virginia, which has been set at \$12.5 million since 2004, bringing the total to \$46.5 million.
- Dividing the total residential personal property tax by the effective tax rate produces the total assessed value of vehicles in the County, \$1.7 billion
- It is estimated that there are 93,500 vehicles in the County. Dividing the number of vehicles into the total assessed value of vehicles gives an average assessed value per vehicle of \$18,100.

Table 3.Estimation of the Average DepreciatedValue of Residential Vehicles, StaffordCounty, Virginia (constant \$2014)		
	<u>Amount</u>	
Personal Property Tax FY 2014	\$45,378,700	
Percent Residential	0.75	
Residential Prop. Tax	\$34,034,025	
PPTRA	\$12,500,000	
Total Residential Tax	\$46,534,025	
Property Tax Rate Per \$100	\$6.89	
Assessment Ratio	\$675,384,978	
Effective Tax Rate	0.40	
Depreciated Value of Vehicles	\$1,688,462,446	
Number of Vehicles	93,500	
Depreciated Value per Vehicle	\$18,058	
Number of Households	137,903	
Ave Vehicles Per Household	0.68	
Sources: FY 2014 Adopted Budget and Statistical Section for Stafford County, Virginia		

Table 4 provides an estimate of the average depreciated value per vehicle at the home on the Winding Creek property. For homes averaging \$525,000, it is estimated that the average income of households in those homes is \$191,000, based on a ratio of 2.75 to account for home price affordability. This compares to an estimated average household income in the County of \$110,000 (the median household income is about \$95,000). Assuming that homes at the Winding Creek property have vehicles valued at the same ratio as income compared to the County as a whole, average value of vehicles at the site would be \$31,000, appropriate for this level of income.

Value of Vehicles at the WindingCreek Property, Stafford County,Virginia (constant \$2014)		
	Amount	
Average Home Value	\$525,000	
Income Ratio	2.75	
Average Income	\$190,909	
County Average Income	\$110,000	
Income Ratio	1.74	
County Value Per Vehicle	\$18,058	
Average Value Per Vehicle	\$31,341	
Sources: FY 2014 Adopted Budg Section for Stafford Co	get and Statistical ounty, Virginia	

The last step in deriving the personal property tax for the Winding Creek property is to estimate the number of vehicles at the site, apply the average vehicle depreciated value, and compute the property tax at the County rate of \$6.89 per \$100, assessed at 40 percent of value. In the analysis, an occupancy rate of 97 percent for homes is assumed to account for normal turnover. The result is a projection of the personal property tax at \$106,850 annually.

Table 5.Derivation of Personal Property Taxes at the Winding Creek Property at Buildout, Stafford County, Virginia (constant \$2014)		
	<u>Amount</u>	
Number of Homes Occupancy Rate Number of Households Persons Per Household Numbers of Persons Vehicles Per Capita Number of Vehicles Average Value of Vehicles Total Vehicle Value Assessment Ratio Vehicle Assessed Value Tax Rate per \$100 Personal Property Tax	970.97943.33100.68211 $$31,341$6,597,9500.4$2,639,180$6.89$181,840$	
Sources: FY 2014 Adopted Budg Section for Stafford Co and S. Patz & Associat	et and Statistical ounty, Virginia, es., Inc.	

<u>Consumer Utility Taxes</u>. Expenditures on utilities are typically taxed in Virginia municipalities on the following utilities: electric, gas, water, land line, cell phone, and internet. For households most utility taxes are approximately \$3.00 per month per utility; for five utilities this is \$180 per household per year. For 55 households at the site, utility taxes would come to \$9,900 annually, as the following chart shows.

	<u>Amount</u>
Number of Utilities	5
Ave. Monthly Tax/Utility	\$3.00
Number of Months	12
Annual Utility Tax	\$180
Households	94
Utility Tax	\$16,940

Motor Vehicle License Fees. It was shown above that there would be an estimated 211 vehicles at the Winding Creek Property, at build-out for all 97 homes. Motor vehicle license fees in the County are \$23 per vehicle, yielding total fees at the site of \$4,840.

**Recordation Tax**. The last tax to be considered is the recordation tax, which yields a negligible amount per year for the property. At total property value of \$50.9 million, and assuming a home resale every ten years plus the initial recordation, the total taxable amount over 20 years would be \$152.8 million. The state taxes the (re-)sales at \$0.25 per \$1,000 of valuation, of which one third is returned to the municipality. Total taxes over 20 years would come to \$127,300, or \$6,370 annually.

<u>Summary of Tax Revenues</u>. Table 6 summarizes the tax revenues that could be expected to flow from the homes at the Winding Creek property annually after buildout, in constant \$2014. The total would come to nearly \$755,000 each year.

Table 6.Summary of Annual Taxes for Stafford County from the Winding Creek Property Annually at Buildout (constant \$2014.			
	<u>Amount</u>	Percent	
Real Estate Tax	\$544,900	72.2%	
Personal Property Tax	\$181,840	24.1%	
Utility Tax	\$16,940	2.2%	
Motor Vehicle Licenses	\$4,840	0.6%	
Recordation Tax	\$6,370	0.8%	
Total Tax Revenue	\$754,890	100.0%	
Source: S. Patz & Associates.,	Inc.		

## **On-site Costs to Stafford County**

The previous section derived the major tax revenues that would accrue to Stafford County from the on-site development at the property. The fiscal impacts analysis seeks to compare revenues with costs. In this case, since taxes are deposited in the County's General Fund, those revenues for the site should be compared with the <u>tax-supported costs</u> that the County would incur in serving the residents and businesses at the site. Other sources of revenue can be ignored, since they accrue to separate funds in which expenditures generally equal revenues.

The source for determining the tax-supported costs the County would incur for service to the site is the County's FY2014 Adopted Budget. In the succeeding paragraphs, the budget will be presented both in terms of budgeted expenses and the portion that must be tax supported. The tax-supported portion of the budgeted expenditures will be derived and expressed on a per capita basis – for population (representing residents), employment (representing businesses), and pupils (representing costs of public education. The per capita costs to the County will be applied to the population and pupils at the site to determine the overall costs to the County from the development of the site.

<u>County Budget Expenditures</u>. The recent history of expenditures in the Stafford County budget is presented in Table 7. This is a summary by department or function. FY2012 is the actual audited expenditure, FY2013 and FY2014 are the adopted budgets for the County. The total budget for FY 2014 of \$255 million represents a steady increase in the General Fund allocation compared to FY2013 and FY2012. Of the total in FY2014, the transfer to the School Fund of \$136 million represents a steady 53 percent of the General Fund budget over the last three years. The School Fund has other sources of funding besides these tax transfers, such as state and federal grants.

2014 (current dollars	<u>s)</u>		
<b>Department or Function</b>	<u>Actual</u> <u>FY2012</u>	<u>Adopted</u> <u>FY2013</u>	<u>Adopted</u> <u>FY2014</u>
General Government	\$12,729,940	\$12,392,881	\$12,796,640
Judicial and Courts	\$12,481,174	\$13,039,452	\$13,123,820
Public Safety	\$37,290,975	\$38,367,068	\$39,755,640
Health and Welfare	\$13,802,124	\$13,032,074	\$13,441,624
Recreation & Culture	\$14,865,947	\$15,156,650	\$15,926,170
Planning and Public Works	\$5,994,707	\$6,640,347	\$6,675,480
Miscellaneous	\$19,286,777	<u>\$15,608,956</u>	<u>\$16,842,640</u>
General Fund Except Schools	\$116,451,644	\$114,237,428	\$118,562,014
Transfer to Schools	<u>\$127,028,247</u>	<u>\$133,054,514</u>	<u>\$136,453,431</u>
Total General Fund	\$243,479,891	\$247,291,942	\$255,015,445
Source: Adopted Annual Budget	for FY2014, Stafford	County, Virginia	

# Table 7. Annual General Fund Budgets for Stafford County, Virginia, FY 2012 to FY

Tax-supported County Costs. The FY2014 Adopted Budget for Stafford County gives the proportion of each departmental or functional expenditure that must be supported by local taxes; these are shown in Table 8. Of the total General Fund budget, 89 percent must be supported by taxes. This is 100 percent for the transfer to the schools, and 77 percent for all other expenditures. The tax supported expenditures will be considered costs that must be made up by taxpayers, such as the residents of the Winding Creek property.

Table 8.         FY2014 Budget for Stafford County, Virginia: Total Adopted				
<b>Expenditures, Designated Revenue, and Net Tax Support</b>				
	Adopted	Designated	Net Tax	Percent
<b>Department or Function</b>	<b>FY2014</b>	Revenue	<b>Support</b>	Taxes
General Government	\$12,796,640	\$851,800	\$11,944,840	93.3%
Judicial and Courts	\$13,123,820	\$2,316,112	\$10,807,708	82.4%
Public Safety	\$39,755,640	\$10,387,900	\$29,367,740	73.9%
Health and Welfare	\$13,441,624	\$7,662,833	\$5,778,791	43.0%
Recreation & Culture	\$15,926,170	\$2,022,300	\$13,903,870	87.3%
Planning and Public Works	\$6,675,480	\$4,041,500	\$2,633,980	39.5%
Miscellaneous	<u>\$16,842,640</u>	<u>\$350,000</u>	<u>\$16,492,640</u>	97.9%
General Fund Ex. Schools	\$118,562,014	\$27,632,445	\$90,929,569	76.7%
Transfer to Schools	<u>\$136,453,431</u>	<u>\$0</u>	<u>\$136,453,431</u>	100.0%
Total General Fund	\$255,015,445	\$27,632,445	\$227,383,000	89.2%
Source: Adopted FY2014 Annual Budget for Stafford County, Virginia				

**Per Capita County Costs**. In Table 9 budgeted General Fund expenditures for FY2014 are allocated to population (residents), employment (businesses) and public school pupils. One hundred percent of the General Fund transfer to the School Fund is tax support, meaning that General Fund tax-supported costs per pupil are \$5,011 based on recent enrollment of 27,229 pupils in the County school system. Non-school expenditures are allocated by department to the two other classes of users, population and employment.

For most functional non-school departments, total FY2014 expenditures are allocated to the users in proportion to their numbers, 78 percent population and 22 percent employment. The exceptions are health and welfare, and parks, recreation and culture, which are allocated in their entirety to population. The table shows that the per capita cost of services and facilities for the population average \$516 per capita; for employees, the amount is \$405 per capita. Per pupil cost is \$5,011.

Table 9.         Allocation of FY2014 Tax-supported General Fund Expenditures           to Residents, Employees, and Public School Pupils, Stafford           County, Virginia				
Department or Function	<u>Total Net</u> Tax Support	Population Share	Employment Share	
General Government	\$11,944,840	\$9,355,696	\$2,589,144	
Judicial and Courts	\$10,807,708	\$8,465,047	\$2,342,661	
Public Safety	\$29,367,740	\$23,002,036	\$6,365,704	
Health and Welfare	\$5,778,791	\$5,778,791	\$0	
Recreation & Culture	\$13,903,870	\$13,903,870	\$0	
Planning and Public Works	\$2,633,980	\$2,063,043	\$570,937	
Miscellaneous	<u>\$16,492,640</u>	\$12,917,722	\$3,574,918	
General Fund Except Schools	\$90,929,569	\$75,486,204	\$15,443,365	
Persons	176,067	137,903	38,164	
Per Capita	\$516	\$547	\$405	
Transfer to Schools	\$136,453,431	\$136,453,431	\$0	
Pupils	27,229	27,229	0	
Transfer Per Capita	\$5,011	\$5,011	\$0	
Total General Fund	\$227,383,000	\$211,939,635	\$15,443,365	

<u>**On-site Costs to the County</u>**. Both residents and public school pupils living onsite at the Winding Creek property would incur costs to Stafford County for services and facilities. The table above derived the per capita costs for each of these. The discussion to follow estimates the numbers of residents and pupils would be living at the site after buildout. The estimation of the number of residents is straightforward. The 94 <u>households</u> (occupied housing units) are expected to have 3.3 persons per household. This is a total of 310 people; at a cost of \$547 per person, the resident cost (including children) would come to \$169,960.</u> Calculation of the costs of public school pupils is problematic. The County has prepared estimates of pupil generation by type of housing unit for the County as a whole. For single family homes, this is 0.63 public school pupils per single family home. However, the County recognizes that this average cold be too low for new subdivisions, for which an estimate of 1.06 pupils per unit has been determined. This corresponds closely to the pupil generation at two comparable established developments, Austin Ridge and Augustine in Stafford, which average 1.05 pupils per unit between them. On the recommendation of the Commissioner of Revenue of the County, the figure of 1.06 pupils per single family home was applied. For 94 <u>households</u>, this would give 100 pupils; at \$5,011 in General Fund expenditures per pupil, the cost of education of \$449,810.

Total General Fund costs to the County of the development of the Winding Creek property would be nearly \$670,000, as shown in the following chart:

	<u>Amount</u>
Population Costs Pupil Costs	\$169,960 <u>\$499,810</u>
Total Tax-supported Cost	\$669,770

## Net Fiscal Impact On-site

The high cost of educating public school pupils limits the fiscal impact at the Winding Creek property at the site to a significant tax revenue surplus of \$85,000 annually. (It will be shown below that an off-site revenue surplus for spin-off impacts would considerably increase this tax revenue surplus.) The following chart shows that the surplus would come close to \$85,000 annually. This is a surplus of eleven percent. Since the margin of error for this type of analysis should be approximately plus or minus three percent, this surplus is a statistically significant amount.

On-site Impacts	Amount
Total Tax Revenue	\$754,890
Tax-supportable Costs	- <u>\$669,770</u>
Net Fiscal Benefit	\$85,120

### **Off-site Impacts: Economic and Fiscal**

In addition to the revenues and costs that accrue to Stafford County from the Winding Creek development "on-site," as described above, there are also off-site impacts that occur as residents and businesses on-site spend their income and receipts off-site in the County, and as other businesses then re-spend the business receipts off-site for the purchase of goods and services from other vendors in the County. The multipliers used in this analysis are specific to Stafford Virginia. Consumer budgets are identified by the U.S. Bureau of Labor Statistics by area and income level. About 77 percent of this income is spent, other uses being taxes, savings and transfers to others not living in the household. It is assumed that 50 percent of all consumer expenditures from on-site are made outside of Stafford County, and 50 percent for shelter and 27 percent for retail trade, including automobiles.

Consumer expenditures made off-site in the County are translated into economic impacts in the County using multiplier matrices provided for the local area by the U.S. Bureau of Economic Analysis. These multipliers capture the round-by-round flows of expenditures in the County initiated by residents from on-site. There are separate matrices for business receipts, employment and employee earnings. The items in the consumer budget are multiplied in turn by these expenditure-specific categories in each matrix and summed to give the "ripple effect," "spin-off," or "multiplier effect" of circulation of money through the economy. The ripple effects, plus the original consumer expenditures, equal the total economic impacts of new residents on the county economy.

### **Business Receipts**

The chart below sets forth the economic dollar flows set in motion by activities on-site at the property. The direct expenditures represent the expenditures by residents directly. They total \$19.2 million for occupied housing units. This \$19.2 million in expenditures for goods and services are expected to comprise 50 percent of resident expenditures in-county. Another \$50.3 million in indirect ripple effects or spin-off are created within the County. The indirect ripple effects are almost three times direct expenditures. Altogether, the business impact in Stafford County would come to \$69.4 million. These off-site impacts also create tax receipts and costs to the County as do onsite impacts (see above). These will be explained in paragraphs to follow.

Source of Impacts Off-site	<u>Amount</u>
Direct Expenditures	\$19,154,883
Indirect Ripple Effect	<u>\$50,266,401</u>
Total Business Receipts	\$69,421,283

### **Employment and Earnings**

The expenditures off-site by residents living at the property would create 370± new jobs in the County. These off-site employment impacts would generate \$10.1 million in employee earnings in the County annually. This is an average of about \$27,000 per employee. This is a modest amount since most of the job impacts are in services such as retail trade, eating establishments, and overnight accommodations.

### **Off-site Fiscal Impacts**

The methodology used in projecting fiscal impacts off-site mirror those used to project fiscal impacts on-site. As before, revenues will be limited to taxes, and costs will be those that must be tax-supported, as based on employment. The RIMS II multipliers from the Bureau of Economic Analysis break receipts, employment and earnings impacts down into 21 different sectors, and the impact dollar amounts (business revenues) in the sectors form the basis for determining taxes. Many taxes can be calculated directly from these receipts, such as the retail sales tax, the lodging tax, and the meals tax. Other taxes are based on employment impacts in particular sectors. For example, utility taxes in the County accrue from businesses at the rate of \$40 per employee. Similar relations to employment can be derived for real property taxes and personal property taxes, based on square footage per employee and costs per square foot for real property and personal property, from experience on-site and at other developments.

To calculate each tax for 21 sectors for the impacts for the residential use on site would be tedious, so the results will be presented here in summary form according to the type of use on-site that generates the off-site spin-off impacts.

The residences on-site would generate almost \$421,000 in taxes off-site for the County annually some time after buildout and stabilized occupancies on-site. Impacts would not be immediate, but would build over time as businesses gradually expanded to meet increased demand for goods and services. As with tax-supported costs to the County for on-site uses, the cost to the County for serving expanded business is based on projected employment. The property would generate about 370 jobs off-site in the County. It was shown previously that each job represents about \$405 in costs to the County, for a total cost of about \$149,000 to the County from off-site uses.. Deducting these tax-supported costs from projected tax revenues would leave a net fiscal benefit (tax revenue surplus) of \$272,000 annually, in constant year 2014 dollars.

Table 10.Summary of Fiscal Impacts Generated Off- site by Development of the Winding Creek Property at Full Impact (constant \$2014)		
	<u>Amount</u>	
Real Estate Tax Business Property Tax Retail Sales Tax Meals Tax Transient Occupancy Utility Taxes Recordation Tax Total Taxes Total Cost	\$177,310 \$60,650 \$59,010 \$67,430 \$33,060 \$21,060 <u>\$2,760</u> \$421,280 \$149,010	
Net Fiscal Benefit	<u>\$272.270</u>	
Sources: Bureau of Economic Analysis, U.S. Department of Commerce, and S. Patz & Associates, Inc.		

## **Total Fiscal Impacts**

With an off-site fiscal surplus of \$272,300 and an on-site surplus of \$85,000 per year, the net fiscal benefit to Stafford County would be approximately \$357,000 per year. As noted above, the off-site impacts may not all happen coincident with the on-site impacts, as the expansion of the local economy from the development will lag slightly behind on-site development as businesses adjust to increased demand for their goods and services. The chart below summarizes the on-site and off-site fiscal impacts for the Winding Creek property, in constant year 2014 dollars.

Total Fiscal Impacts	<u>On-site</u>	Off-site	<u>Total</u>
Total Tax Revenue	\$754,890	\$421,280	\$1,176,170
Tax-supportable Costs	<u>-\$669,770</u>	<u>-\$149,010</u>	<u>-\$818,780</u>
Net Fiscal Benefit	\$85,120	\$272,270	\$357,390

## Alternative Fiscal Impacts

The fiscal impacts analysis presented above relies on an average pupil generation rate of 1.06 pupils per household, as suggested by the Commissioner of Revenue. Alternative pupil generation rates have been advanced by county planners. The first is the average of all single family homes, of 0.66 pupils per household, which produces an on-site net benefit of \$274,000. The method applied here, at 1.06 pupils per household, yields an on-site net benefit of \$85,000, as shown above. A very high pupil generation scenario of 1.3 pupils per household creates an on-site deficit of \$28,000, which is greatly offset by the off-site impacts of a net surplus of \$272,000. Results for the three alternative scenarios, on-site and off-site, are shown in Table 11, below:

Table 11.	On-site, Off-site and Total Net Fiscal Impacts for Winding
	<b>Creek Under Three Alternative Pupil Generation Rate</b>
	Scenarios (constant \$2014).

	On Site	Off-site	<u>Total</u>
	<b>Impacts</b>	<b>Impacts</b>	<b>Impacts</b>
County Average Scenario 1/			
Total Tax Revenues	\$754,890	\$421,280	\$1,176,170
Less: Tax-supported Costs	-\$481,160	-\$149,010	-\$630,170
Net Fiscal Benefit	\$273,730	\$272.270	\$546,000
	+,	+=,==	+
New Subdivisions Scenario 2/			
Total Tax Revenues	\$754 890	\$421 280	\$1 176 170
Less: Tax-supported Costs	-\$669 770	-\$149,010	-\$818 780
Net Fiscal Benefit	<u>\$85,120</u>	\$272,270	\$357 390
	<i>403,120</i>	<i>\\\\</i>	\$557,570
High Generation Scenario 3/			
Total Tax Revenues	\$754 890	\$421 280	\$1 176 170
Less: Tax-supported Costs	-\$782,930	-\$149.010	-\$931 940
Net Fiscal Benefit	<u>-\$78.040</u>	\$272 270	<u>=\$244</u> 230
Net I Isear Denem	-\$20,040	φ272,270	φ244,230
1/ At 0.66 pupils par household			
1/ At 0.00 pupils per nousenoid.			
2/ At 1.20 pupils per household			
SI At 1.50 pupils per nousenoid			
Saurasa Stafford County and S. Data & Associates Inc.			
Sources: Starrord County and S. Patz & Associates, Inc.			

Attachment 11 Page 1 of 185

# 

July 31, 2013

Mr. Frank Lackman DR Horton, Inc. 1356 Beverly Road, Suite 300 McLean, Virginia 22101

## RE: Musselman Property, Stafford County, Virginia Small Whorled Pogonia Survey

Dear Mr. Lackman:

Bowman Consulting Group, Ltd. (BCG) has completed a habitat assessment and field survey for small whorled pogonia (*Isotria medeoloides*) on the Musselman Property, which is identified as Parcel 29-4 and located at 327 Winding Creek Road, approximately 0.6 mile north of its intersection with Courthouse Road in Stafford County, Virginia. The field survey was conducted on June 25, 2013 by Mr. Philip Abell of BCG, who is on the U.S. Fish and Wildlife Service (USFWS) Virginia Field Office's list of qualified surveyors for this plant. The following letter details the habitat requirements for the small whorled pogonia, the methodology employed during the field survey, and the results of the survey, with an Aerial Photograph Exhibit and representative site photographs attached.

The small whorled pogonia is an orchid that is a State-listed endangered and Federal-listed threatened plant species. This species is one of the rarest of the native orchids. The small whorled pogonia may lie dormant for as many as ten years before reappearing in a given location. Natural and man-made factors are both believed to influence this dormancy period. Natural factors include seasonal precipitation levels, long-term climatic variations, vertebrate and insect herbivory, and changes in the amount of sunlight penetrating the forest canopy as a result of natural causes, such as large trees blown down by storms. Man-made influences may include cutting down of trees in selective timber harvesting, use of the forest as pasture area, or the occasional traffic of off-road or farm vehicles through the area.

Habitat for the small whorled pogonia generally occurs in mature, deciduous upland forests having acidic soil and terrain that is gently to moderately sloping. Slope orientation is typically in northerly or easterly directions. Typical forest habitat consists of deciduous species in the canopy, with moderately open understory, relatively little groundcover, and sunlight patches on the forest floor. In general, areas with extensive or predominant stands of pine can be eliminated as potential habitat.

The approximately 64.6-acre Musselman Property includes an existing residence along Winding Creek Road and mixed deciduous and coniferous forest, with Austin Run flowing through the northern portion as shown on the attached Aerial Photograph Exhibit. Major portions of the Property are dominated by relatively young regrowth forest, which generally indicates past Letter to Mr. Frank Lackman, DR Horton, Inc. Musselman Property, Stafford County, Virginia – Small Whorled Pogonia Survey July 31, 2013 Page 2 of 3

disturbance either from logging/timbering operations and/or agricultural uses such as crops or pasture land. These regrowth forested areas on the Property exhibit a relatively dense understory and groundcover, which is considered unsuitable habitat for the small whorled pogonia. Virginia pine (*Pinus virginiana*) is prevalent in many of the upland areas in the central portion and almost the entirety of the Property on the western side of Winding Creek Road. Virginia pine, which is unsuitable habitat conditions for the small whorled pogonia, is a characteristic pioneering species and is typically indicative of a regrowth condition. The western portion of the Property that isn't dominated by Virginia pine between Winding Creek Road and the adjacent Berkshire community is characterized by young (2 to 6-inch DBH) regrowth hardwoods (see Photo #1).

Other unsuitable habitat areas observed on the Property include Austin Run and its immediate floodplain, an unnamed drainageway in the southeastern portion, areas of steep slopes, and disturbed areas, especially along Winding Creek Road and an existing powerline easement that extends through the southernmost portion of the Property and just north of Embrey Mill Road, as shown on the Aerial Photograph Exhibit. The portion of the easement that is not currently grassed and mowed/maintained is dominated by young saplings of tulip poplar (*Liriodendron tulipifera*), sweetgum (*Liquidambar styraciflua*), and red maple (*Acer rubrum*) ranging in size from a couple of inches to a foot in DBH.

During the detailed habitat assessment and field survey, several areas of potential suitable habitat for the small whorled pogonia were identified in the eastern portion of the Property along relatively level to moderate slopes with a northerly or easterly slope aspect. The approximate location and extent of these potential suitable habitat areas, labeled P1 through P5, are depicted with yellow hatching on the attached Aerial Photograph Exhibit. These areas were surveyed in detailed for small whorled pogonia by walking transects through each area.

As generally shown in Photos #2 and #3, Areas P1 through P5 are dominated by relatively mature (>12-inch DBH) hardwood forest consisting of white oak (*Quercus alba*), southern red oak (*Quercus falcata*), American beech (*Fagus grandifolia*) and hickory (*Carya* sp.) in the overstory, with saplings of the above species and large specimens of flowering dogwood (*Cornus florida*) in the understory. These areas are characterized by relatively sparse shrub and groundcover layers dominated by roundleaf greenbrier (*Smilax rotundifolia*), mapleleaf viburnum (*Viburnum acerifolium*), Virginia creeper (*Parthenocissus quinquefolia*), blueberry (*Vaccinium* sp.), and striped prince's pine (*Chimaphila maculata*).

Based on the results of the June 25, 2013 field survey, no individuals or populations of small whorled pogonia were observed within the Musselman Property. It should also be noted that no individuals or populations of whorled pogonia (*Isotria verticillata*) were observed within the Property. These species, while not on Federal or State-protected species listings, have habitat requirements similar to those of the small whorled pogonia and are often used as indicators of potential suitable habitat.

This small whorled pogonia survey is limited to conditions prevailing at the time the survey was conducted. Because of the small whorled pogonia's life cycle, the fact that this species was not observed on the Property during the June 25, 2013 site visit does not entirely eliminate the

Letter to Mr. Frank Lackman, DR Horton, Inc. Musselman Property, Stafford County, Virginia – Small Whorled Pogonia Survey July 31, 2013 Page 3 of 3

possibility that it may appear in subsequent growing seasons and/or that the USFWS may require additional surveys in subsequent growing seasons. As directed by the USFWS Virginia Field Office, species surveys for the small whorled pogonia can be conducted in areas north of Caroline County, Virginia between June 1st and July 20th of any given year, and the results of these surveys are valid for a period of two (2) years. Species surveys may be conducted sooner or later than those dates based upon site-specific information or prevailing favorable climatological conditions; however, prior approval should be obtained from the USFWS Virginia Field Office.

Please note that copies of this Small Whorled Pogonia Survey Report will need to be forwarded to the U.S. Army Corps of Engineers and the Virginia Department of Environmental Quality during the wetland permitting process for the Property for further coordination with the U.S. Fish & Wildlife Service and the Virginia Department of Conservation and Recreation, as necessary.

If you have any questions concerning the results of the Survey, please feel free to contact me or Ms. Jessica Fleming of BCG at 703.464.1000.

Sincerely, BOWMAN CONSULTING GROUP, LTD.

Philip Abell

Senior Environmental Scientist

Enclosures: Aerial Photograph Exhibit Photographs



Attachment 11 Page 4 of 185

SMALL WHORLED POGONIA SURVEY AERIAL PHOTOGRAPH EXHIBIT MUSSELMAN PROPERTY Parcel 29-4 Stafford County, Virginia

SCALE: 1"=200'

DATE: July 31, 2013



Bowman Consulting Group, Ltd. 3863 Centerview Drive, Suite 300 Chantilly, Virginia 20151

Phone: (703) 464-1000 Fax: (703) 481-8410 www.bowmanconsulting.com


**Photo #1:** Representative view of current site conditions on the western side of Winding Creek Road, showing the forest dominated by Virginia pine and young regrowth trees, with a relatively dense understory, which is considered unsuitable habitat for small whorled pogonia.



**Photo #2:** Representative view of current site conditions in Area P1 in the northern portion of the Property along a north-facing slope above Austin Run, showing potential suitable habitat for the small whorled pogonia consisting of relatively mature hardwood forest with a relatively open understory and sparse groundcover.



**Photo #3:** Representative view of current site conditions in Area P3 in the central-eastern portion of the Property along a north-facing slope, showing potential suitable habitat for the small whorled pogonia consisting of relatively mature hardwood forest with a relatively open understory and sparse groundcover.

Attachment 11 Page 7 of 185

# Perennial Flow Evaluation and CRPA Determination

# Winding Creek

Tax Map # 29, Parcels 4 and 5C Stafford County, Virginia

April 25, 2014

Prepared for:

Winding Creek Owner, LLC Attn: Mr. Frank Lackman 15256 Welton Court Centreville, Virginia 20120 Phone: 703.463.1808

Prepared by:



Bowman Consulting Group, Ltd. 14020 Thunderbolt Place, Suite 300 Chantilly, Virginia 20151 Phone: 703.464.1000 Fax: 703.481.9720

### **Table of Contents**

Introduction
Methodology1
Precipitation Data
Results
Stream A
Stream C 5
Stream D5
Wetland E
Stream F – Austin Run
Wetland G 6
Stream H6
Conclusion

#### **Tables**

Table 1:	Year 2013 and 2014 Monthly Precipitation Data	2
Table 2:	Daily Precipitation Data	2
Table 3:	Summary of Stream Sampling Results	6

#### **Appendices**

- Appendix A: USGS Quadrangle Map
- Appendix B: Aerial Photograph
- Appendix C: Perennial Flow Evaluation and CRPA Delineation Map
- Appendix D: Stafford County Tax Map 29 North
- Appendix E: NCDWQ Stream Classification Forms
- Appendix F: Representative Photographs

### **Introduction**

On March 24 and April 2, 2014, Bowman Consulting Group, Ltd., (BCG) conducted a Perennial Flow Evaluation and Critical Resource Protection Area (CRPA) Determination for the Winding Creek Project. The approximately 63.1-acre Property is identified as Tax Map 29, Parcels 4 and 5C, and located at 327 Winding Creek Road, approximately 0.6 mile north of its intersection with Courthouse Road in Stafford County, Virginia. More generally, the Property is located at 38°27'10"N Latitude and -77°26'59"W Longitude on the Stafford, VA USGS Quadrangle Map (Appendix A). The site is bordered by residential and forested properties to the north, east, and west, and residential, forested, and agricultural properties to the south. The majority of the Property is characterized by medium-aged, mixed-hardwood and coniferous forest, with an existing residence in the southern portion on the eastern side of Winding Creek Road. Winding Creek Road transects the western portion of the Property from east to west (see Appendix B for the Aerial Photograph and Appendix C for the Perennial Flow Evaluation and CRPA Delineation Map).

The Property drains to the north towards Austin Run and unnamed tributaries to Austin Run, which are located within the Lower Aquia Creek watershed (PL57) of Hydrologic Unit Code (HUC) 02070011 (Lower Potomac). Based on existing Stafford County Tax Map 29 North, nine blue-line streams are currently mapped on or immediately adjacent to the Property (refer to Appendix D). Current Stafford County GIS information depicts a CRPA boundary mapped along Austin Run within the northern portion of the Property.

Concurrent with the Perennial Flow Evaluation study in March and April, 2014, BCG also conducted a routine wetland delineation within the limits of investigation for the Winding Creek Project based on the *Corps of Engineers Wetlands Delineation Manual* (1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual*: *Eastern Mountain and Piedmont Region* (Version 2.0, April 2012) (Report and Map dated April 25, 2014); the Perennial Flow Evaluation and CRPA Delineation Map included as Appendix C reflects the surveyed limits of these flagged waters of the U.S. and wetland boundaries. Confirmation of the flagged waters of the U.S. and wetland boundaries by the USACE during a Jurisdictional Determination site visit is currently pending. Based on the results of the wetland delineation, there are approximately 1,606 linear feet of stream channel and 0.62 acre of palustrine forested wetlands (PFO) located within the Property limits.

#### **Methodology**

During the field evaluation, BCG utilized visual observation and/or the North Carolina Division of Water Quality (NCDWQ) Stream Classification Method (Version 4.11, September 2010), as approved for use by Stafford County, to determine if stream(s) identified during the wetland delineation and/or those indicated as blue-line streams on Tax Map 29 North (dated January 27, 2012, see Appendix D) exhibit perennial flow. The Perennial Flow Evaluation and CRPA Determination study included a field inspection of each stream, and incorporated evaluation of the following characteristics: hydrology, geomorphology, soils, aquatic organisms, amphibians, and vegetation. The streams were scored on the strength or absence of each characteristic. Each characteristic was scored using a ranked numeric value by subjectively evaluating each component as "absent", "weak", "moderate", or "strong". The NCDWQ Method generally stipulates a minimum total score of 30 as an appropriate value to identify a stream as perennial, or if certain biological indicators (such as fish, crayfish, amphibians, mussels, large tadpoles, or benthic macroinvertebrates of the Ephemeroptera, Plecoptera, or Trichoptera) are present.

BCG also reviewed existing site conditions to determine whether wetlands located adjacent to any identified perennial stream would be considered "connected by surface flow and contiguous to" that perennial stream in accordance with the Virginia Department of Conservation and Recreation's (DCR) Resource Protection Areas: Nontidal Wetlands, Guidance on the Chesapeake Bay Preservation Area Designation and Management Regulations (Adopted June 18, 2007, Revised December 10, 2007), and therefore, a component of the CRPA under Section 28-62(b)(1) of the County's Chesapeake Bay Preservation Area (CBPA) Policy.

#### **Precipitation Data**

Precipitation data for Stafford Regional Airport (*http://www.wunderground.com/cgi-bin/findweather/hdfForecast?query=stafford%2C+va&searchType=WEATHER*) was reviewed to document recent rainfall events in the region and overall precipitation for the preceding months. Stafford Regional Airport precipitation data for the period of September 2013 through March 2014, and daily precipitation information for the days prior to the Perennial Flow Evaluation and CRPA Determination are provided in the tables below. Normal, or 30-year average precipitation was not available from this weather station; however, based on precipitation data for Washington National Airport, the NOAA National Weather Service Forecast Office for Baltimore/Washington, the amount of rainfall from September 2013 through March 2014 (27.07 inches) was 4.82 inches higher than normal (22.25 inches) (*http://www.weather.gov/climate/index.php?wfo=lwx*).

Month	Precipitation (in)
September 2013	1.77
October 2013	3.91
November 2013	2.68
December 2013	5.31
January 2014	1.75
February 2014	2.51
March 2014	3.10
Total	21.03

 Table 1: Year 2013 and 2014 Monthly Precipitation Data<sup>1</sup>

Table 2:	Daily	Precipitation	Data <sup>1</sup>
----------	-------	---------------	-------------------

Date	Precipitation (in)
March 9, 2014	0.00
March 10, 2014	0.00
March 11, 2014	0.00
March 12, 2014	0.02

Perennial Flow	<b>Evaluation</b>	and CRPA	Determination
I cremmar I low	Lyanaanon	and CIA I	Determination

Date	Precipitation (in)
March 13, 2014	0.00
March 14, 2014	0.00
March 15, 2014	0.00
March 16, 2014	0.09
March 17, 2014	0.11
March 18, 2014	0.00
March 19, 2014	0.21
March 20, 2014	0.00
March 21, 2014	0.00
March 22, 2014	0.00
March 23, 2014	0.00
March 24, 2014 <sup>2</sup>	0.00
March 25, 2014	0.15
March 26, 2014	0.00
March 27, 2014	0.00
March 28, 2014	0.05
March 29, 2014	0.65
March 30, 2014	1.20
March 31, 2014	0.00
April 1, 2014	0.00
April 2, 2014 <sup>2</sup>	0.00

<sup>1</sup>http://www.wunderground.com/cgi-

bin/findweather/hdfForecast?query=stafford%2C+va&searchType=WEATHER <sup>2</sup>Dates of BCG's field investigations for the Property's Perennial Flow Evaluation and CRPA Determination Study.

The last significant precipitation (>0.5 inch) event before the March 24, 2014 site visit occurred on February 13, 2014 (0.93 inch), with a total of 1.15 inches of precipitation during the month prior to the March 24, 2014 site visit, excluding snowfall. The last significant precipitation (>0.5 inch) event before the April 2, 2014 site visit occurred on March 30, 2014 (1.20 inches), with a total of 3.10 inches of precipitation during the month prior to the April 2, 2014 site visit.

#### **Results**

Perennial flow determination (PFD) sampling was conducted along four identified stream channels (Streams A, C, D, and H) within the limits of investigation for the Property; the approximate PFD sampling locations are indicated on the attached Perennial Flow Evaluation and CRPA Delineation Map. Given existing site conditions, formal PFD sampling was not conducted along other blue-line streams due to the absence of flow and/or a defined stream channel, as described below. Likewise, Austin Run (Stream F), which transects the northern portion of the Property, was also not formally evaluated due its strong perennial nature. The Stream Sampling Data Forms that summarize the scoring for each stream reach where formal PFD sampling was conducted are included as Appendix E, and representative photographs of

Perennial Flow Evaluation and CRPA Determination

each sampling reach are included as Appendix F. The following details the results of the Perennial Flow Evaluation studies for the Project.

#### Stream A

Stream A transects the southeastern portion of the Property, originating from a linear palustrine forested wetland at a grade control near Flags A7/A8, and flowing northeast until it continues offsite and outside the Property limits near Flags A45/A46. Stream A is identified as a blue-line stream on Stafford County Tax Map 29 North and the Stafford, VA USGS Quadrangle Map; County GIS information does not include a CRPA along this system. Stream A was evaluated at PFD-A1 near Flags A11/A12, PFD-A2 near Flags A25/A26, and PFD-A3 near Flags A39/A40.

As described in PFD-A1 and shown in Photos #1 and #2, Stream A averages 4 feet in width in its upstream portion where it appears to have been previously straightened/ditched, and exhibited moderate flow on the date of the investigation. Stream A exhibits a strong presence of leaf litter, moderate continuity of channel bed and bank, grade controls, sediment on plants or debris, and organic debris lines or piles, and weak in-channel structure, particle size of stream substrate, depositional bars or benches, and recent alluvial deposits. No benthic macroinvertebrates, fish or amphibians were observed within the channel during the sampling event. Stream A scored 21 overall, and should be considered *non-perennial*, or intermittent.

As described in PFD-A2 and shown in Photos #3 and #4, Stream A averages 4 to 7 feet in width in its middle portion, and exhibited moderate flow on the date of the investigation. Stream A exhibits a strong continuity of channel bed and bank, moderate sinuosity of channel along thalweg, recent alluvial deposits, leaf litter, sediment on plants and debris, and organic debris lines or piles, and weak in-channel structure, particle size of stream substrate, active/relict floodplain, depositional bars or benches, headcuts, and grade controls. A few macroinvertebrates, including mayflies, stoneflies, amphipods, and a worm, were observed within the sampling reach; however, it should be noted that macroinvertebrates were absent in the majority of the sampling reach. No amphibians or fish were observed during the sampling event. Stream A scored 28 overall, and should be considered *non-perennial*, or intermittent.

As described in PFD-A3 and shown in Photos #5 through #8, Stream A averages 3 to 7 feet in width downstream of its confluence with Stream C, and exhibited moderate flow on the date of the investigation. The sampling reach extends up to a headcut/grade control located approximately 20 feet downstream from Flags A29/A30, and just above its confluence with the side Stream C. Stream A exhibits strong continuity of channel bed and bank, depositional bars or benches, moderate sinuosity of channel along thalweg, in-channel structure, particle size of stream substrate, recent alluvial deposits, grade controls, leaf litter, sediment on plants and debris, and organic debris lines or piles, and weak active/relict floodplain. A small amount of algae was observed within the channel during the sampling event. Benthic macroinvertebrates observed within the stream channel included several mayflies, isopods, stoneflies, and caddisfly cases; no amphibians or fish were observed. Stream A scored 37 overall, and should be considered *perennial* up to the headcut/grade control near Flags A29/A30, and have a CRPA associated with it.

#### Stream C

Stream C is located in the southeastern portion of the Property, connecting into Stream A at Flags C15/C16 and A33/A34. Stream C originates from a linear forested wetland at a headcut at Flags C9/C10, flowing north towards Stream A. Stream C is not mapped as a blue-line stream on Stafford County Tax Map 29 North, or on the Stafford, VA USGS Quadrangle Map. Stream C was evaluated at PFD-C1 at Flags C11/C12. As shown in Photos #9 and #10, Stream C averages 3 to 7 feet in width and exhibited moderate flow on the date of the investigation. Stream C exhibits a strong presence of continuous bed and bank and sediment on plants or debris, moderate headcuts, and leaf litter, and weak sinuosity of channel along thalweg, in-channel structure, particle size of stream substrate, depositional bars or benches, grade controls, and organic debris lines or piles. American Beech (*Fagus grandifolia*, FACU) was observed growing within the stream channel during the sampling event; no benthic macroinvertebrates, fish, or amphibians were observed. Stream C scored 23 overall, and should be considered **non-perennial**, or intermittent.

#### Stream D

Stream D is located in the northeastern portion of the Property and just west of Wetland E. Stream D originates from a linear forested wetland at a headcut at Flags D11/D16, flowing northeast towards Wetland E. Stream D appears as a blue-line stream on Stafford County Tax Map 29 North; County GIS information does not include a CRPA along this stream. Stream D was evaluated at PFD-D1 at Flags D15/D20. As shown in Photos #11 through #14, Stream D averages 4 to 9 feet in width and exhibited weak flow on the date of the investigation. Stream D exhibits a strong presence of organic debris lines or piles, moderate recent alluvial deposits, headcuts, grade controls, and leaf litter, and weak continuity of channel bed and banks, sinuosity of channel along thalweg, in-channel structure, particle size of stream substrate, depositional bars or benches, and sediment on plants or debris. No benthic macroinvertebrates, fish or amphibians were observed within the channel during the sampling event. Stream D scored 23.5 overall, and should be considered *non-perennial*, or intermittent.

County Tax Map 29 North indicates two side blue-line streams off of Stream D near Flags D13/D15 and Flags D27/D32; County GIS information does not include CRPAs along these systems. As shown in Photos #15 and #16, a defined stream channel or other jurisdictional waters of the U.S. was not observed in either of the mapped side blue-line streams. Therefore, these two topographic features were not formally evaluated, and they should not have CRPAs associated with them.

#### Wetland E

Wetland E is mapped as a blue-line stream on Stafford County Tax Map 29 North; County GIS information does not include a CRPA along this system. During the wetland delineation conducted by BCG in March and April, 2014, a linear forested wetland system was identified and flagged in this area. Photo #17 provides a downslope view of Wetland E from Flags E1/E2. Given existing site conditions and its classification as a linear wetland rather than a stream channel, Wetland E was not formally evaluated.

#### Stream F – Austin Run

Austin Run (Stream F) transects the northern corner of the Property from west to east. Austin Run originates from offsite to the west of the Property near Flags F5/F6. Austin Run appears as a

blue-line stream on Stafford County Tax Map 29 North and on the Stafford, VA USGS Quadrangle Map; County GIS information includes a CRPA along this stream. Austin Run was not formally evaluated due its strong perennial nature as shown in Photos #18 and #19. Austin Run should be considered *perennial*, and have a CRPA associated with it.

County Tax Map 29 North indicates three side blue-line streams on the southern side of Austin Run and within the Property; County GIS information does not include CRPAs along these systems. As shown in Photos #20 through #22, a defined stream channel or other jurisdictional waters of the U.S. was not observed in any of these mapped side blue-line streams, as further described by Data Points DP-UPL2, DP-UPL3, and DP-UPL5 collected during the wetland delineation study. Therefore, these topographic features were not formally evaluated, and they should not have CRPAs associated with them.

#### Wetland G

Wetland G, located on the western side of Winding Creek Road, is also mapped as a blue-line stream on Stafford County Tax Map 29 North; County GIS information does not include a CRPA along this system. During the wetland delineation conducted by BCG in March and April, 2014, a forested wetland system was identified and flagged in this area, continuing offsite to the west onto the adjacent residential lots along Easter Drive. Photos #23 and #24 provide a downslope views of Wetland G from Flags G10 and G26, respectively. Given existing site conditions and its classification as a wetland rather than a stream channel, Wetland G was not formally evaluated and should not have a CRPA associated with it.

#### Stream H

Stream H is located in the northern corner of the Property and just north of Austin Run (Stream F), connecting into Austin Run just offsite to the east. Stream H originates from offsite to the north of the Property near Flags H5/H6. Stream H appears as a blue-line stream on Stafford County Tax Map 29 North; County GIS information does not include a CRPA along this stream. Stream H was evaluated onsite at PFD-H1 at Flags H7/H8. As shown in Photos #25 through #28, Stream H averages 4 to 10 feet in width and exhibited weak flow on the date of the investigation. Within the onsite portion, Stream H exhibits a strong presence of sinuosity of channel along thalweg, moderate particle size of stream substrate, leaf litter, sediment on plants or debris, and organic debris lines or piles, and weak continuity of channel bed and bank, in-channel structure, active/relict floodplin, depositional bars or benches, recent alluvial deposits, headcuts, and grade controls. A small amount of algae was observed within the stream channel during the sampling event; no benthic macroinvertebrates, fish or amphibians were observed. Stream H scored 23 overall, and should be considered *non-perennial*, or intermittent.

The following table summarizes the results of the PFD study conducted by BCG on March 24 and April 2, 2014, including the corresponding photographs, the PFD score, and the appropriate classification of each system:

Table 5: Summary of Stream Sampling Results							
System ID	Sampling Location	Photo #	Score	Stream Classification			
Stream A	PFD-A1	1,2	21	Intermittent			
Stream A	PFD-A2	3,4	28	Intermittent			

Table 3: Summary of Stream Sampling Results

Perennial Flow Evaluation and CRPA Determination

System ID	Sampling Location	Photo #	Score	Stream Classification
Stream A	PFD-A3	5,6,7,8	37	Perennial
Stream C	PFD-C1	9,10	23	Intermittent
Stream D	PFD-D1	11,12,13,14	23.5	Intermittent
Stream D - Side Blue Line Streams	N/A	15,16	N/A	N/A
Wetland E	N/A	17	N/A	N/A
Stream F - Austin Run	N/A	18,19	N/A	Perennial
Stream F - Side Blue Line Streams	N/A	20,21,22	N/A	N/A
Wetland G	N/A	23,24	N/A	N/A
Stream H	PFD-H1	25,26,27,28	24	Intermittent

#### **Conclusion**

Based on the results of the above Perennial Flow Evaluation and CRPA Determination study, Austin Run (Stream F) and the portion of Stream A up to the headcut/grade control located approximately 20 feet downstream of Flags A29/A30 should be classified as perennial and have CRPAs associated with them. Stream C, Stream D, Stream H, and Stream A between Flags A1/A2 and the R3/R4 transition point near Flags A29/A30, should be considered non-perennial or intermittent, and not have CRPAs associated with them.

In accordance with Section 28-62(b)(1) of the County's CBPA Policy, the site-specific CRPA boundaries are mapped as follows:

- The Perennial Flow Evaluation confirmed that Stream A is perennial up to the R3/R4 transition point located approximately 20 feet downstream from Flags A29/A30. Based on the results of the wetland delineation study, there are no wetlands present along the perennial portion of Stream A and within the limits of investigation for the Property. In accordance with the County's CBPA Policy and DCR's Nontidal Wetlands Guidance, the site-specific CRPA boundary along Stream A is mapped 100 feet upslope and landward from the surveyed limits of Stream A up to the R3/R4 transition point indicated on the Map included as Appendix C.
- Based on the results of the wetland delineation study, there are no wetlands adjacent to Austin Run (Stream F) that would be considered contiguous to and connected by surface flow to the perennial stream. Therefore, the site-specific CRPA boundary along Austin Run is mapped 100 feet upslope and landward from the surveyed limits of Austin Run.

The Perennial Flow Evaluation and CRPA Delineation Map included as Appendix C depicts the final site-specific CRPA boundaries within the Property limits.

Appendix A

USGS Quadrangle Map

#### Attachment 11 Page 17 of 185



Appendix B

**Aerial Photograph** 



Scale: 1"=400'



Bowman Consulting Group, Ltd. 14020 Thunderbolt Place Suite 300 Chantilly, Virginia 20151 Phone: (703) 464-1000 Fax: (703) 481-9720 www.bowmanconsulting.com Source: ArcGIS (2014)

Aerial Photograph Winding Creek 38°27'10"N, -77°26'59"W Stafford, VA USGS Quadrangle Map PL57 (Lower Aquia Creek), HUC 02070011 (Lower Potomac) Stafford County, Virginia

Prepared for: Winding Creek Owner, LLC 15256 Welton Court Centreville, Virginia 20120

© Bowman Consulting Group, Ltd.

Appendix C

Perennial Flow Evaluation and CRPA Delineation Map

Perennial Flow Evaluation and CRPA Determination

Appendix D

Stafford County Tax Map 28 North





Tax Map

29North



For the most up to date Tax Map information go to: http://www.staffordcountygis.org ---Disclaimer---Accept

Stafford County Office Of The Commissioner of Revenue



Appendix E

**Stream Sampling Data Forms** 

Date: March 24, 2014		Project/Site: Winding Creek/PFD-A1	Latitude: 6849128.70
Evaluator: S. Gagnon & J. Muller		County: Stafford, Va	Longitude: 11783696.15
<b>Total Points:</b> Stream is at least intermittent if $\ge$ 19 or perennial if $\ge$ 30*	21	Stream Determination (circle one) Ephemeral IntermittenD Perennial	Other e.g. Quad Name: Stafford, Va (1994)

A. Geomorphology (Subtotal = <u>8</u> )	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0	1	2	3	
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
4. Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel		0 = 0	Yes :	= 3	
<sup>a</sup> artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal =7)					
12. Presence of Baseflow	0	1	2	3	
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	N	0 = 0	Yes	= 3	
C. Biology (Subtotal = <u>6</u> )					
18. Fibrous roots in streambed	3	2	1	0	
19. Rooted upland plants in streambed	3	2	1	0	
20. Macrobenthos (note diversity and abundance)	0	1	2	3	
21. Aquatic Mollusks	Ō	1	2	3	
22. Fish	0	0.5	1	1.5	
23. Crayfish	Ō	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	
25. Algae	Ō	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; 0	OBL = 1.5 Other = 0	$\bigcirc$	
*perennial streams may also be identified using other methods. See p. 35 of manual.					
Notes:	Notes:				

Date: April 2, 2014		Project/Site: Winding Creek/PFD-A2	Latitude: 6849291.68
Evaluator: J. Fleming & S. Gagnon		County: Stafford, Va	Longitude: 11783918.40
Total Points:Stream is at least intermittent28if $\geq$ 19 or perennial if $\geq$ 30*		Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name: Stafford, Va (1994)

A. Geomorphology (Subtotal = <u>13.5</u> )	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
<ol> <li>In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence</li> </ol>	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel		0 = 0	Yes =	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 7.5)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0 Yes = 3			
C. Biology (Subtotal = <u>7</u> )				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed FACW = 0.75; OBL = 1.5 Other = 0				
*perennial streams may also be identified using other methods. See p. 35 of manual.				
Notes: Macrobenthos observed included mayfly, stonefly, amphipods, and a worm. Macrobenthos were absent in the				
majority of the sampling reach.				

Date: April 2, 2014	Project/Site: Winding Creek/PFD-A3	Latitude: 6849307.58	
Evaluator: J. Fleming & S. Gagnon	County: Stafford, Va	Longitude: 11784087.86	
Total Points:Stream is at least intermittent $37$ if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	<b>Other</b> e.g. Quad Name: Stafford, Va (1994)	

A. Geomorphology (Subtotal = <u>20</u> )	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0	1	2	3	
<ol> <li>In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence</li> </ol>	0	1	2	3	
4. Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	N	o = 0	Yes =	= 3	
<sup>a</sup> artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal =7.5)					
12. Presence of Baseflow	0	1	2	3	
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?No = 0Yes = 3					
C. Biology (Subtotal = $9.5$ )					
18. Fibrous roots in streambed	3	2	1	0	
19. Rooted upland plants in streambed	3	2	1	0	
20. Macrobenthos (note diversity and abundance)	0	1	2	3	
21. Aquatic Mollusks	0	1	2	3	
22. Fish	0	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; C	DBL = 1.5 Other = 0	>	
*perennial streams may also be identified using other methods. See p. 35 of manual.					
Notes: Macrobenthos observed included mayflies, isopods, stoneflies, and caddisfly cases throughout the reach.					
Sketch:					

Date: March 24, 2014		Project/Site: Winding Creek/PFD-C1	Latitude: 6849231.79
Evaluator: S. Gagnon & J. Muller		County: Stafford, Va	Longitude: 11784022.35
<b>Total Points:</b> Stream is at least intermittent if $\ge$ 19 or perennial if $\ge$ 30*	23	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name: Stafford, Va (1994)

A. Geomorphology (Subtotal = <u>10.5</u> )	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0	1	2	3	
<ol> <li>In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence</li> </ol>	0	1	2	3	
4. Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel		0 = 0	Yes :	= 3	
<sup>a</sup> artificial ditches are not rated; see discussions in manual	·		·		
B. Hydrology (Subtotal = 7.5)					
12. Presence of Baseflow	0	1	2	3	
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	No = 0 Yes = 3				
C. Biology (Subtotal = <u>5</u> )	•				
18. Fibrous roots in streambed	3	2	1	0	
19. Rooted upland plants in streambed	3	2	1	0	
20. Macrobenthos (note diversity and abundance)	0	1	2	3	
21. Aquatic Mollusks	0	1	2	3	
22. Fish	0	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed	26. Wetland plants in streambed FACW = 0.75; OBL = 1.5 Other = 0				
*perennial streams may also be identified using other methods. See p. 35 of manual.					
Notes:					

Date: March 24, 2014		Project/Site: Winding Creek/PFD-D1	Latitude: 6850113.10
Evaluator: S. Gagnon & J. Muller		County: Stafford, Va	Longitude: 11783548.88
<b>Total Points:</b> Stream is at least intermittent if $\ge$ 19 or perennial if $\ge$ 30*	23.5	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name: Stafford, Va (1994)

A. Geomorphology (Subtotal =1	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0	1	2	3	
<ol> <li>In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence</li> </ol>	0	1	2	3	
4. Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel		0 = 0	Yes :	= 3	
<sup>a</sup> artificial ditches are not rated; see discussions in manual	·				
B. Hydrology (Subtotal = <u>6.5</u> )					
12. Presence of Baseflow	0	1	2	3	
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	(1.5)	
17. Soil-based evidence of high water table?No = 0Yes = 3					
C. Biology (Subtotal = <u>6</u> )					
18. Fibrous roots in streambed	3	2	1	0	
19. Rooted upland plants in streambed	3	2	1	0	
20. Macrobenthos (note diversity and abundance)	0	1	2	3	
21. Aquatic Mollusks	0	1	2	3	
22. Fish	0	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; 0	OBL = 1.5 Other = 0	$\supset$	
*perennial streams may also be identified using other methods. See p. 35 of manual.					
Notes:					

Date: March 24, 2014		Project/Site: Winding Creek/PFD-H1	Latitude: 6851237.79
Evaluator: S. Gagnon & J. Muller		County: Stafford, Va	Longitude: 11783279.01
<b>Total Points:</b> Stream is at least intermittent if $\ge$ 19 or perennial if $\ge$ 30*	24	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name: Stafford, Va (1994)

A. Geomorphology (Subtotal = <u>12</u> )	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0	1	2	3	
<ol> <li>In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence</li> </ol>	0	1	2	3	
4. Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
8. Headcuts	0	(1)	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel		0 = 0	Yes	= 3	
<sup>a</sup> artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal = <u>6.5</u> )					
12. Presence of Baseflow	0	1	2	3	
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?No = 0Yes = 3					
C. Biology (Subtotal = $5.5$ )					
18. Fibrous roots in streambed	3	2	1	0	
19. Rooted upland plants in streambed	3	2	1	0	
20. Macrobenthos (note diversity and abundance)	0	1	2	3	
21. Aquatic Mollusks	0	1	2	3	
22. Fish	0	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; 0	OBL = 1.5 Other = 0	V	
*perennial streams may also be identified using other methods. See p. 35 of manual.					
Notes:					

Perennial Flow Evaluation and CRPA Determination

Appendix F

**Representative Photographs** 



**Photo #1:** Upstream view of Stream A from Flags A11/A12 at PFD-A1, where the stream is moderately defined with moderate flow observed during the field investigation (March 24, 2014, by S. Gagnon, BCG).



**Photo #2:** Downstream view of Stream A from Flags A11/A12, where PFD-A1 was conducted. The stream scored a 21 and was determined to be non-perennial, or intermittent (March 24, 2014, 2013, by S. Gagnon, BCG).



**Photo #3:** Upstream view of Stream A from Flags A21/A22 near PFD-A2, where the stream is well defined with moderate flow observed during the field investigation (April 2, 2014, by J. Fleming, BCG).



**Photo #4:** Downstream view of Stream A from Flags A21/A22, near where PFD-A2 was conducted. The stream scored a 28 and was determined to be non-perennial, or intermittent (April 2, 2014, by J. Fleming, BCG).



**Photo #5:** Upstream view of the Stream A R3/R4 transition point, which is located a headcut approximately 20 feet downstream from Flags A29/ (April 2, 2014, by J. Fleming, BCG).



**Photo #6:** Downstream view of the Stream A R3/R4 transition point, showing moderate flow and substrate sorting on the date of the investigation (April 2, 2014, by J. Fleming, BCG).



**Photo #7:** Upstream view of Stream A from Flags A39/A40, where PFD-A3 was conducted. The stream scored a 37 and was determined to be perennial (April 2, 2014, by J. Fleming, BCG).



**Photo #8:** Downstream view of Stream A from Flags A39/A40 at PFD-A3, where the stream is well defined with moderate flow observed during the field investigation (April 2, 2014, by J. Fleming, BCG).



**Photo #9:** Upstream view of Stream C from Flags C11/C12, where PFD-C1 was conducted. The stream scored a 23 and was determined to be non-perennial, or intermittent (March 24, 2014, by S. Gagnon, BCG).



**Photo #10** Downstream view of Stream C from Flags C11/C12 at PFD-C1, where the stream is well defined with moderate flow during the field investigation (March 24, 2014, by S. Gagnon, BCG).



**Photo #11:** Upstream view of Stream D from Flags D15/D20, where PFD-D1 was conducted. The stream scored a 23.5 and was determined to be intermittent, or non-perennial (March 24, 2014, by S. Gagnon, BCG).



**Photo #12:** Downstream view of Stream D from Flags D15/D20 at PFD-D1, where the stream is weakly defined with weak flow during the field investigation (March 24, 2014, by S. Gagnon, BCG).



**Photo #13:** Upstream view of Stream D from near Flags D33/D38, where the stream is weakly defined with weak substrate sorting (March 21, 2014, by S. Gagnon, BCG).



**Photo #14:** Downstream view of Stream D from near Flags D33/D38, showing weak flow within the channel (March 21, 2014, by S. Gagnon, BCG).



**Photo #15:** Downslope view of a side blue-line stream depicted on Stafford County Tax Map 29N adjacent to Stream D near Flags D13/D18. A defined stream channel was not observed, and a formal PFD evaluation was not conducted (March 21, 2014, by S. Gagnon, BCG).



**Photo #16:** Upslope view of a second side blue-line stream depicted on Stafford County Tax Map 29N adjacent to Stream D near Flags D27/D32. A defined stream channel was not observed, and a formal PFD evaluation was not conducted (March 21, 2014, by S. Gagnon, BCG).



**Photo #17:** Downslope view of Wetland E from Flags E1/E2. Wetland E was not formally evaluated given existing site conditions and its classification as a linear wetland rather than a stream channel (March 21, 2014, by S. Gagnon, BCG).



**Photo #18:** Downstream view of Stream F (Austin Run) from near Flags F5/F6, where the stream is well defined with strong substrate sorting (March 21, 2014, by S. Gagnon, BCG).



**Photo #19:** Downstream view of Stream F (Austin Run) from near Flags F11/F12, showing strong flow within the channel (March 21, 2014, by S. Gagnon, BCG).



**Photo #20:** Downslope view of a side blue-line stream depicted on Stafford County Tax Map 29N adjacent to Winding Creek Road. A defined stream channel was not observed, and a formal PFD evaluation was not conducted (March 24, 2014, by S. Gagnon, BCG).


**Photo #21:** Upslope view of a second side blue-line stream depicted on Stafford County Tax Map 29N adjacent to Stream F (Austin Run) near Flags F7/F8. A defined stream channel was not observed, and a formal PFD evaluation was not conducted (March 21, 2014, by S. Gagnon, BCG).



**Photo #22:** Downslope view of a third side blue-line stream depicted on Stafford County Tax Map 29N adjacent to Stream F (Austin Run) near F13/F14. A defined stream channel was not observed, and a formal PFD evaluation was not conducted (March 21, 2014, by S. Gagnon, BCG).



**Photo #23:** Downslope view of Wetland G from Flag G10. Wetland G was not formally evaluated given existing site conditions and its classification as a linear wetland rather than a stream channel (March 21, 2014, by S. Gagnon, BCG).



**Photo #24:** Downslope view of Wetland G from Flag G26. Wetland G was not formally evaluated given existing site conditions and its classification as a linear wetland rather than a stream channel (March 21, 2014, by S. Gagnon, BCG).



**Photo #25:** Upstream view of Stream H from Flags H7/H8, where PFD-H1 was conducted. The stream scored a 24 and was determined to be intermittent, or non-perennial (March 24, 2014, by S. Gagnon, BCG).



**Photo #26:** Downstream view of Stream H from Flags H7/H8 at PFD-H1, where the stream is weakly defined with no flow during the field investigation (March 24. 2014, by S. Gagnon, BCG).



**Photo #27:** Upstream view of the offsite portion of Stream H as it flows through a maintained lawn (March 24, 2014, by S. Gagnon, BCG).



**Photo #28:** Downstream view of Stream H at its convergence with Austin Run (Stream F) offsite near Flags F13/F14 (March 24. 2014, by S. Gagnon, BCG).



# Legend

	Property Boundary
	Index Contours
	Contours (CI=2')
	Perennial Streams (R3)
	Intermittent Streams (R4)
\nu         \nu         \nu         \nu         \nu           \nu         \nu         \nu         \nu         \nu         \nu	Wetlands (PFO)
RPA RPA	Critical Resource Protection Area (CRPA)
A1	Flags
<table-cell-rows> DP-1</table-cell-rows>	Wetland Delineation Data Points
SPFD-A1	Perennial Flow Determination Sampling Locations
1	Photographs

# NOTES:

- Hydrologic Unit Code (HUC) 02070011 (Lower Potomac).
- (USACE).
- Jurisdictional Determination.
- mapped onsite along Austin Run only.
- and downstream from the point indicated on the map.
- downstream of Flags A29/A30).
- detailed information.

1. The approximately 63.1-acre Winding Creek Project area is identified as Tax Map 29, Parcels 4 and 5C, and located at 327 Winding Creek Road, approximately 0.6 mile north of its intersection with Courthouse Road in Stafford County, Virginia. More generally, the Property is located at 38°27'10"N Latitude and -77°26'59"W Longitude on the Stafford, VA USGS Quadrangle Map (1994). The site drains towards Austin Run, which is located within the Lower Aquia Creek watershed (PL57) of

2. Property boundary and wetland survey information provided by Bowman Consulting Group, Ltd. (BCG). Topographic information obtained from the Stafford County GIS.

3. The waters of the U.S., including wetlands, within the limits of investigation for the Project were delineated by BCG in March and April, 2014 based on the requirements of the *Corps of Engineers* Wetlands Delineation Manual (1987) and the Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Eastern Mountains and Piedmont (Version 2.0, 2012), and represent those areas that are most likely within the regulatory purview of the U.S. Army Corps of Engineers

4. The flagged waters of the U.S. and wetland boundaries were field located by BCG in April 2014 using conventional survey methods. Survey information is provided at NAD83, Virginia State Plane, North Zone, - 4501, NAVD88, US Survey Feet.

5. The flagged boundaries should be considered preliminary until approved by the USACE during a

6. Based on a review of Stafford County Tax Map 29N, nine blue-line streams are currently depicted on or immediately adjacent to the Property, with a Critical Resource Protection Area (CRPA) currently

7. Stream classifications (perennial vs. non-perennial, or intermittent) are based on field assessments by BCG on March 24 and April 2, 2014 using the North Carolina Division of Water Quality Identification Methods for the Origins of Intermittent and Perennial Streams (Version 4.11, September 2010). Each stream sampling location extends approximately 50 to 100 feet upstream

8. The site-specific CRPA boundaries depicted on this Map are based on the results of the wetland delineation and perennial flow evaluation studies. In accordance with Section 28-62(b)(1) of the County's Chesapeake Bay Preservation Area (CBPA) Policy and the Virginia Department of Conservation and Recreation's Resource Protection Areas: Nontidal Wetlands, Guidance on the Chesapeake Bay Preservation Area Designation and Management Regulations, the CRPA boundaries are mapped 100-feet upslope or landward of the greater of the surveyed perennial stream boundaries (Austin Run (Stream F) and Stream A up to a headcut approximately 20 feet

9. Refer to the Winding Creek Perennial Flow Evaluation and CRPA Determination Report for more

Waters of the U.S. and Wetlands Summary Table					
Classification <sup>2</sup>	Length (LF)	Area (SF)	Area (Ac)		
Perennial Streams (R3)	466	N/A	N/A		
Intermittent Streams (R4)	1,140	N/A	N/A		
Palustrine Forested Wetlands (PFO)	N/A	27,004	0.62		
Total Waters of the U.S.	1,606	27,004	0.62		

limits. <sup>2</sup>Stream classifications are based on field assessments by BCG in March and April, 2014 using the NCDWQ Identification Methods for the Origins of Intermittent and Perennial Streams (Version 4.11, September 2010), as approved for use by Stafford County.

<sup>1</sup> The amount of waters of the U.S. and wetlands indicated in the table reflects the amount located within the Property

Summary of Stream Sampling Results						
System ID	Sampling Location	Photo #	Score	Stream Classification		
Stream A	PFD-A1	1,2	21	Intermittent		
Stream A	PFD-A2	3,4	28	Intermittent		
Stream A	PFD-A3	5,6,7,8	37	Perennial		
Stream C	PFD-C1	9,10	23	Intermittent		
Stream D	PFD-D1	11,12,13,14	23.5	Intermittent		
Stream D – Side Blue Line Streams	N/A	15,16	N/A	N/A		
Wetland E	N/A	17	N/A	N/A		
Stream F – Austin Run	N/A	18,19	N/A	Perennial		
Stream F – Side Blue Line Streams	N/A	20,21,22	N/A	N/A		
Wetland G	N/A	23,24	N/A	N/A		
Stream H	PFD-H1	25,26,27,28	24	Intermittent		

# GRAPHIC SCALE





Attachment 11 Page 46 of 185

# Bowman CONSULTING

April 25, 2014

Mr. Frank Lackman Winding Creek Owner, LLC 15256 Welton Court Centreville, Virginia 20120

### RE: Winding Creek, Stafford County, Virginia Threatened and Endangered Species Review

Dear Mr. Lackman:

Bowman Consulting Group, Ltd. (BCG) has completed a threatened and endangered species review for the approximately 63.1-acre Winding Creek Project identified as Tax Map 29, Parcel 4 and located at 627 Winding Creek Road, approximately 0.6 mile north of its intersection with Courthouse Road in Stafford County, Virginia. This Review includes general descriptions of existing habitat conditions, Property-specific information obtained from the U.S. Fish and Wildlife Service (F&WS), the Virginia Department of Conservation and Recreation (DCR), the Virginia Department of Game and Inland Fisheries (DGIF), and an evaluation of the likelihood of those identified listed species occurring on, or in the vicinity of, the Property.

As shown on the attached Aerial Photograph, the Property is generally comprised of medium-aged mixed-hardwood forest, with medium-aged coniferous forest located within the central, western, and southern portions of the Property, and an existing house in the southern portion on the eastern side of Winding Creek Road. There is an existing underground utility easement that transects the southern portion of the Property, and Winding Creek Road transects the western portion of the Property. Austin Run transects the northern portion of the Property from west to east. Two stream and wetland systems that drain to the north into Austin Run are located in the eastern portion of the Property; the southeastern system appears to transition to perennial flow just upstream of the eastern boundary. A third tributary originates from offsite and flows parallel to the northern portion on the western side of Winding Creek Road. Refer to the attached representative site photographs for general habitat conditions within the Property.

BCG completed an initial project scoping search of F&WS's Information, Planning and Conservation System (IPaC) to determine whether any Federal-listed threatened or endangered species, designated critical habitat, or other natural resources of concern may be affected by the proposed development at the Property. Based on the results of the IPaC official species search, dwarf wedgemussel (*Alasmidonta heterodon*, FE/SE), harperella (*Ptilimnium nodosum*, FE/SE) and small whorled pogonia (*Isotria medeoloides*, FT/SE) are identified within Stafford County and listed as having the potential to occur on the Property should suitable habitat be present.

In response to BCG's Project Review Request dated March 17, 2014, DCR provided the attached Project Review Letter dated April 4, 2014 to provide preliminary information related to threatened and endangered species and other natural heritage resources on, or in the vicinity of, the Property. The Project Review included a search of DCR's Biotics Data System for Bowman Consulting Group, Ltd.

14020 Thunderbolt Place • Suite 300 • Chantilly, Virginia 20151 Phone: 703.464.1000 • Fax: 703.481.9720 • bowmanconsulting.com Letter to Frank Lackman, Winding Creek Owner, LLC Winding Creek, Stafford County, Virginia – Threatened and Endangered Species Evaluation April 25, 2014 Page 2 of 3

occurrences of natural heritage resources, including rare, threatened, or endangered plant and animal species habitat, unique or exemplary natural communities, and significant geologic formations within a one mile radius of the Property. According to the DCR results, small whorled pogonia is listed as having the potential to occur on the Property should suitable habitat be present. A DCR Map showing predicted suitable habitat for the small whorled pogonia on the Property is also enclosed.

Given the potential for small whorled pogonia on the Property, Mr. Philip Abell of BCG, who is on the F&WS list of qualified surveyors for this plant, conducted a habitat assessment and field survey for small whorled pogonia on the Property for a previous client on June 25, 2013. While areas of potential suitable habitat for this species were identified during the survey, no individuals or colonies of small whorled pogonia were observed on or immediately adjacent to the Property. Please refer to the Small Whorled Pogonia Survey Report dated July 31, 2013 for more detailed information.

BCG also conducted a search of DGIF's Virginia Fish and Wildlife Information Service (VaFWIS) for records of threatened and endangered species known or having the potential to occur within a 2-mile radius of the Property; see attached search results. According to DGIF, only the dwarf wedgemussel is listed as having the potential to occur within Austin Run on the Property. The dwarf wedgemussel is typically found in sand, firm muddy sand, and gravel bottoms in rivers of varying sizes, with slow to moderate current. As noted above, two perennial streams (Austin Run and an unnamed tributary to Austin Run) were identified on the Property. As shown in Photo #6, the unnamed perennial tributary to Austin Run flows through a medium-aged mixed-hardwood deciduous forested from west to northeast, and is characterized by slow-flowing water with moderate diversity and sorting of streambed substrate. As shown on Photos #8 and #9, Austin Run flows through a medium-aged mixed-hardwood deciduous forest from west to east, and is characterized by moderately-flowing water with strong diversity and sorting of streambed substrate. All other stream channels located on the Property are intermittent in nature and drain towards Austin Run. Given that the existing habitat conditions within the onsite portions of Austin Run and the perennial and intermittent tributaries to Austin Run, it is highly unlikely that the dwarf wedgemussel and/or suitable habitat for this species is present on the Property.

The other potential Federal and/or State-listed species on the DGIF VaFWIS list – Atlantic sturgeon (*Acipenser oxyrinchus*, FE/SE), upland sandpiper (*Bartramia longicauda*, ST), loggerhead shrike (*Lanius ludovicianus*, ST), and migrant loggerhead shrike (*Lanius ludovicianus*, ST) – are those species generally associated with Stafford County, but are not confirmed on or in the vicinity of the Property, and for which suitable habitat is not present on the Property.

It should also be noted that harperella (FE/SE) has only been documented in Stafford County within Aquia Creek on the eastern side of Interstate 95. Its general habitat requirements consist of rocky or gravel shoals and sandbars and along the margins of clear, swift-flowing streams, which are not present on the Property.

Letter to Frank Lackman, Winding Creek Owner, LLC Winding Creek, Stafford County, Virginia – Threatened and Endangered Species Evaluation April 25, 2014 Page 3 of 3

Based on a review of the VaEagles online database, which provides location information of active/occupied and recently active nests based on the bald eagle nest survey for the 2013 breeding season conducted by the Center for Conservation Biology, there are no documented bald eagle nests on, or in the immediate vicinity of, the Property.

Based on the above evaluations for those identified listed species and the results of the previous small whorled pogonia survey, the potential for occurrences of or potential impacts to listed species is considered low, and no Federal or State-listed threatened or endangered species are anticipated to be adversely affected by this Project.

Please note that this Review represents a general review of existing site conditions and a general evaluation for the probability of listed species and natural heritage resources as occurring on the Property, and does not represent a detailed habitat assessment or field survey for any of the above species or natural communities, with the exception of the small whorled pogonia results performed under a separate detailed habitat assessment and field survey. Please also note that during the permitting process by the U.S. Army Corps of Engineers and the Virginia Department of Environmental Quality, the Project will be formally reviewed by DCR, DGIF, and U.S. Fish and Wildlife Service for potential adverse impacts to threatened and endangered species and other natural heritage resources, and additional habitat assessments, species-specific field surveys, and/or time-of-year restrictions may be recommended by those agencies for the Property.

If you have any questions concerning this Review or would like to schedule a meeting to discuss the Property and potential threatened and endangered species issues, please feel free to contact me at 703.464.1000 or jfleming@bowmancg.com.

Sincerely, BOWMAN CONSULTING GROUP, LTD.

Jessica Fleming, Q.E.P., P.W.D. Senior Project Manager

Enclosures



Scale: 1"=400'



Bowman Consulting Group, Ltd. 14020 Thunderbolt Place Suite 300 Chantilly, Virginia 20151 Phone: (703) 464-1000 Fax: (703) 481-9720 www.bowmanconsulting.com Source: ArcGIS (2014)

Aerial Photograph Winding Creek 38°27'10"N, -77°26'59"W Stafford, VA USGS Quadrangle Map PL57 (Lower Aquia Creek), HUC 02070011 (Lower Potomac) Stafford County, Virginia

Prepared for: Winding Creek Owner, LLC 15256 Welton Court Centreville, Virginia 20120

© Bowman Consulting Group, Ltd.



# **United States Department of the Interior**

FISH AND WILDLIFE SERVICE Virginia Ecological Services Field Office 6669 SHORT LANE GLOUCESTER, VA 23061 PHONE: (804)693-6694 FAX: (804)693-9032 URL: www.fws.gov/northeast/virginiafield/



Consultation Tracking Number: 05E2VA00-2014-SLI-1382 Project Name: Musselman Property

March 18, 2014

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project.

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having

similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan

(http://www.fws.gov/windenergy/eagle\_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and

http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment



United States Department of Interior Fish and Wildlife Service

Project name: Musselman Property

# **Official Species List**

## **Provided by:**

Virginia Ecological Services Field Office 6669 SHORT LANE GLOUCESTER, VA 23061 (804) 693-6694 http://www.fws.gov/northeast/virginiafield/

## Consultation Tracking Number: 05E2VA00-2014-SLI-1382

Project Type: Development

**Project Description:** The approximately 64.6-acre Musselman Property is located at 327 Winding Creek Road in Stafford County, Virginia, and proposes the development of a residential community comprised of single-family detached lots.

Attachment 11 Page 53 of 185



United States Department of Interior Fish and Wildlife Service

Project name: Musselman Property

## **Project Location Map:**



**Project Coordinates:** MULTIPOLYGON (((-77.4510093 38.4570375, -77.447104 38.4504177, -77.4491639 38.4487372, -77.4534126 38.4500648, -77.4510093 38.4570375)))

Project Counties: Stafford, VA



United States Department of Interior Fish and Wildlife Service

Project name: Musselman Property

# **Endangered Species Act Species List**

There are a total of 3 threatened, endangered, or candidate species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed on the **Has Critical Habitat** lines may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Dwarf wedgemussel (Alasmidonta heterodon) Population: Entire Listing Status: Endangered

harperella (*Ptilimnium nodosum*) Listing Status: Endangered

Small Whorled pogonia (Isotria medeoloides) Listing Status: Threatened

http://ecos.fws.gov/ipac, 03/18/2014 07:53 AM

Attachment 11 Page 55 of 185



United States Department of Interior Fish and Wildlife Service

Project name: Musselman Property

# Critical habitats that lie within your project area

There are no critical habitats within your project area.

http://ecos.fws.gov/ipac, 03/18/2014 07:53 AM

Molly Joseph Ward Secretary of Natural Resour



Clyde E. Cristman Director

# COMMONWEALTH of VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION

600 East Main Street, 24<sup>th</sup> Floor Richmond, Virginia 23219 (804) 786-6124

April 4, 2014

Sean Gagnon Bowman Consulting Group, Ltd. 14020 Thunderbolt Place, Suite 300 Chantilly, VA 20151

Re: 9370-02-002, Musselman Property

Dear Mr. Gagnon:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, there is a potential for Small whorled pogonia (*Isotria medeoloides*, G2/S2/LT/LE) to occur in the project area if suitable habitat exists on site. Small whorled pogonia, a perennial orchid, grows in a variety of woodland habitats in Virginia, but tends to favor mid-aged woodland habitats on gently north or northeast facing slopes often within small draws. It is quite natural for plants of this species to remain dormant in the soil for long periods of time. Direct destruction, as well as habitat loss and alteration, are principle reasons for the species' decline (Ware, 1991). The Virginia Field Office of the U.S. Fish and Wildlife Service recommends that field surveys for this species be conducted in areas of Virginia south of Caroline County from May 25 through July 15 and in areas of Virginia from Caroline County and north from June 1 through July 20 (K. Mayne, pers. com. 1999). Please note that this species is currently classified as threatened by the United States Fish and Wildlife Service (USFWS) and as endangered by the Virginia Department of Agriculture and Consumer Services (VDACS).

Due to the potential for this site to support populations of Small whorled pogonia, DCR recommends an inventory for the resource in the study area. With the survey results we can more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources.

DCR-Division of Natural Heritage biologists are qualified and available to conduct inventories for rare, threatened, and endangered species. Please contact J. Christopher Ludwig, Natural Heritage Inventory

State Parks • Soil and Water Conservation • Outdoor Recreation Planning Natural Heritage • Dam Safety and Floodplain Management • Land Conservation Manager, at <u>chris.ludwig@dcr.virginia.gov</u> or 804-371-6206 to discuss arrangements for field work. A list of other individuals who are qualified to conduct inventories may be obtained from the USFWS.

Due to the legal status of Small whorled pogonia, DCR also recommends coordination with the U.S. Fish and Wildlife Service (USFWS) to ensure compliance with endangered species legislation.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. Survey results should be coordinated with DCR-DNH and USFWS. Upon review of the results, if it is determined the species is present, and there is a likelihood of a negative impact on the species, DCR-DNH will recommend coordination with VDACS to ensure compliance with Virginia's Endangered Plant and Insect Species Act.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

New and updated information is continually added to Biotics. Please re-submit a completed order form and project map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

A fee of \$95.00 has been assessed for the service of providing this information. Please find enclosed an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, DCR - Division of Natural Heritage, 600 East Main Street, 24<sup>th</sup> Floor, Richmond, VA 23219. Payment is due within thirty days of the invoice date. <u>Please note the change of address for remittance of payment as of July 1, 2013</u>. Late payment may result in the suspension of project review service for future projects.

The Virginia Department of Game and Inland Fisheries (VDGIF) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from <a href="http://vafwis.org/fwis/">http://vafwis.org/fwis/</a> or contact Gladys Cason (804-367-0909 or <a href="http://wafwis.cason@dgif.virginia.gov">Gladys.Cason@dgif.virginia.gov</a>).

Should you have any questions or concerns, feel free to contact me at (804) 692-0984. Thank you for the opportunity to comment on this project.

Sincerely,

Alli Baird

Alli Baird, LA, ASLA Coastal Zone Locality Liaison

Cc: Troy Andersen, USFWS

#### Literature Cited

Ware, D.M.E. 1991. Small whorled pogonia. In Virginia's Endangered Species: Proceedings of a Symposium. K. Terwilliger ed. The McDonald and Woodward Publishing Company, Blacksburg, Virginia.



March 18, 2014



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

# VaFWIS Search Report Compiled on 3/18/2014, 9:11:43 AM

### Help

Known or likely to occur within a 2 mile radius around point 38.4527778 -77.4497222 in 179 Stafford County, VA

## View Map of Site Location

439 Known or Likely Species ordered by Status Concern for Conservation (displaying first 20) (20 species with Status\* or Tier I\*\* or Tier II\*\* )

BOVA Code	<u>Status*</u>	<u>Tier**</u>	<u>Common Name</u>	<u>Scientific Name</u>	Confirmed	Database(s)
010032	FESE	II	<u>Sturgeon,</u> <u>Atlantic</u>	Acipenser oxyrinchus		BOVA
060003	FESE	II	<u>Wedgemussel,</u> <u>dwarf</u>	Alasmidonta heterodon	Potential	BOVA,Habitat,HU6
040129	ST	Ι	Sandpiper, upland	Bartramia longicauda		BOVA
040293	ST	Ι	<u>Shrike,</u> loggerhead	Lanius ludovicianus		BOVA
040292	ST		<u>Shrike, migrant</u> loggerhead	Lanius ludovicianus migrans		BOVA
050022	FP		Bat, northern long-eared	Myotis septentrionalis		BOVA
010038	FC	IV	<u>Alewife</u>	Alosa pseudoharengus		HU6
100248	FS	Ι	Fritillary, regal	Speyeria idalia idalia		BOVA,HU6
040093	FS	II	Eagle, bald	Haliaeetus leucocephalus		BOVA,HU6
030063	CC	III	Turtle, spotted	Clemmys guttata		BOVA,HU6
010077		Ι	Shiner, bridle	Notropis bifrenatus		BOVA
040372		Ι	Crossbill, red	Loxia curvirostra		BOVA
040225		Ι	Sapsucker, yellow-bellied	Sphyrapicus varius		BOVA
040319		Ι	Warbler, black- throated green	Dendroica virens		BOVA
040038		II	Bittern, American	Botaurus lentiginosus		HU6
040052		II	Duck, American black	Anas rubripes		BOVA,HU6

040213	II	Owl, northern saw-whet	Aegolius acadicus	Yes	SppObs,HU6
040105	II	<u>Rail, king</u>	Rallus elegans		BOVA,HU6
040320	II	Warbler, cerulean	Dendroica cerulea		BOVA,HU6
040266	II	Wren, winter	Troglodytes troglodytes		BOVA

To view All 439 species View 439

\* FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; FS=Federal Species of Concern; CC=Collection Concern

\*\* I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need

> View Map of All Query Results from All Observation Tables

Bat Colonies or Hibernacula: Not Known

#### **Anadromous Fish Use Streams**

N/A

**Impediments to Fish Passage** 

N/A

**Colonial Water Bird Survey** 

N/A

#### **Threatened and Endangered Waters**

N/A

## **Managed Trout Streams**

N/A

## **Bald Eagle Concentration Areas and Roosts**

N/A

## **Bald Eagle Nests**

N/A

Species	Species Observations (8 records)			<u>View Ma</u> Species C	p of All Quer Observations	<u>y Results</u>	
				]	N Species		
obsID	class	Date Observed	Observer	Different Species	Highest TE <sup>*</sup>	Highest Tier <sup>**</sup>	View Map
<u>316078</u>	SppObs	Nov 9 2006	Andrew Dolby (Principle Permittee)	1		II	Yes
<u>316077</u>	SppObs	Nov 2 2006	Andrew Dolby (Principle Permittee)	1		II	Yes
<u>425463</u>	SppObs	May 2 1996	VCU - INSTAR	7			Yes
<u>51704</u>	SppObs	May 2 1996	Werner Wieland, Mary Washington College	7			Yes
<u>16298</u>	SppObs	Oct 2 1982	R. E. WATSON	11			Yes
337460	SppObs	Jan 1 1982	REW-B-WATSON	11			Yes
364258	SppObs	Jan 1 1900		1			Yes
18231	SppObs	Jan 1 1900		1			Yes

**Displayed 8 Species Observations** 

# Habitat Predicted for Aquatic WAP Tier I & II Species (2 Reaches)

#### View Map Combined Reaches from Below of Habitat Predicted for WAP Tier I & II Aquatic Species

	Tier Species						<b>X</b> 7•
Stream Name	Highest TE <sup>*</sup>	BOVA Code, Status <sup>*</sup> , Tier <sup>**</sup> , Common & Scientific Name					
(20700112)	FESE	060003	FESE	II	Wedgemussel, dwarf	Alasmidonta heterodon	<u>Yes</u>
Austin Run (20700112)	FESE	060003	FESE	II	Wedgemussel, dwarf	Alasmidonta heterodon	Yes

# Habitat Predicted for Terrestrial WAP Tier I & II Species

## N/A

## Virginia Breeding Bird Atlas Blocks (2 records)

<u>View Map of All Query Results</u> <u>Virginia Breeding Bird Atlas Blocks</u>

		Breeding	• •		
ID BBA	Atlas Quadrangle Block Name	Different Species	Highest TE <sup>*</sup>	Highest Tier <sup>**</sup>	View Map
51164	Stafford, CE	40		IV	Yes
51162	Stafford, NE	1			Yes

## **Public Holdings:**

N/A

# Summary of BOVA Species Associated with Cities and Counties of the Commonwealth of Virginia:

<b>FIPS Code</b>	<b>City and County Name</b>	<b>Different Species</b>	Highest TE	<b>Highest</b> Tier
179	Stafford	431	FESE	Ι

**USGS 7.5' Quadrangles:** Stafford

USGS NRCS Watersheds in Virginia:

N/A

# USGS National 6th Order Watersheds Summary of Wildlife Action Plan Tier I, II, III, and IV Species:

HU6 Code	USGS 6th Order Hydrologic Unit	<b>Different Species</b>	Highest TE	Highest Tier
PL56	Upper Aquia Creek	54	FESE	Ι
PL57	Lower Aquia Creek	56	FESE	Ι
PL58	Accokeek Creek	51	FCSS	Ι

Compiled on 3/18/2014, 9:11:43 AM I529435.0 report=all searchType= R dist= 3218 poi= 38.4527778 -77.4497222

PixelSize=64; Anadromous=0.037644; BBA=0.077228; BECAR=0.045627; Bats=0.023543; Buffer=0.158371; County=0.057033; HU6=0.121556; Impediments=0.030571; Init=0.198539; PublicLands=0.048168; Quad=0.059731; SppObs=0.397884; TEWaters=0.030848; TierReaches=0.074121; TierTerrestrial=0.085176; Total=1.618896; Trout=0.044414; huva=0.051877

#### VaFWIS Map



# WELCOME TO THE VIRGINIA BALD EAGLE NEST LOCATOR!

The Center for Conservation Biology (CCB) has created a Google Maps application to allow users to locate documented eagle territories in Virginia. CCB encourages the use of our data sets in wildlife conservation and management applications, but as a professional courtesy we ask that data users read and agree to the full terms of our Data Use Agreement. By viewing the Eagle Nest Locator on this site you agree to the Data Use Agreement and Terms of Use for VaEagles Nest Locator.

In 2012, CCB modified the area surveyed for the Virginia bald eagle nest survey. The information presented in this online map presents the most recent data CCB has on eagle nests in Virginia. If you are using this site for management purposes, we highly recommend confirming the status of every nest before proceeding with activities that may affect eagles. We encourage you to contact regulatory agencies (listed below) about questions you may have about eagle management on your property. All data/maps used according to this agreement should be cited using the following text:

Watts, B. D. and M. A. Byrd. 2013. Virginia bald eagle nest survey: 2013 breeding season. Center for Conservation Biology, College of William and Mary and Virginia Commonwealth University, Williamsburg, VA.





**Photo #1:** View to the southeast of a maintained utility easement which transects the southern portion of the Property (March 21, 2014, by S. Gagnon, BCG).



**Photo #2:** Downslope view of a linear forested wetland located within the southwestern portion of the Property (March 21, 2014, by S. Gagnon, BCG).



**Photo #3:** View to the north of Winding Creek Road, which transects the western portion of the Property (March 21, 2014, by S. Gagnon, BCG).



**Photo #4:** View to the south within an upland portion of the Property. Dominant species include tulip poplar and Princess pine (March 21, 2014, by S. Gagnon, BCG).



**Photo #5:** Downstream view of an intermittent stream that transects the southern Portion of the Property. Dominant species adjacent to the stream were white oak and tulip poplar (March 21, 2014, by S. Gagnon, BCG).



**Photo #6:** Upstream view of a perennial stream that transects the southern portion of the Property. Dominant species adjacent to the stream were white oak and Christmas fern (March 21, 2014, by S. Gagnon, BCG).



**Photo #7:** Downstream view of a second intermittent stream located within the central portion of the Property. Dominant species adjacent to the stream include American beech and tulip poplar (March 21, 2014, by S. Gagnon, BCG).



**Photo #8:** View to the north within the floodplain adjacent to Austin Run within the northern portion of the Property. Dominant species included American beech and tulip poplar (March 21, 2014, by S. Gagnon, BCG).



**Photo #9:** Downstream view of Austin Run located within the northern portion of the Property (March 21, 2014, by S. Gagnon, BCG).



**Photo #10:** Upstream view of a third intermittent stream that transects the northern Property corner and flows through a maintained lawn area (March 24, 2014, by S. Gagnon, BCG).

Attachment 11 Page 71 of 185

# **Wetland Delineation**

# Winding Creek

*Tax Map 29, Parcels 4 and 5C* Stafford County, Virginia

April 25, 2014

Prepared for:

Winding Creek Owner, LLC c/o Mr. Frank Lackman 15256 Welton Court Centreville, Virginia 20120 Phone: 703.463.1808

Prepared by:



Bowman Consulting Group, Ltd. 14020 Thunderbolt Place, Suite 300 Chantilly, Virginia 20151 Phone: 703.464.1000 Fax: 703.481.9720

## Wetland Delineation Report

# **Table of Contents**

Executive Summary	1
Property Description	1
Methodology	1
Soils:	2
Vegetation:	3
Hydrology:	3
Results	3

# List of Tables

Table 1: Soils Summary Table	2
Table 2: Data Point Summary Table	6
Table 3: Waters of the U.S. and Wetlands Summary Table	7

# **Appendices**

Appendix A:	USGS Quadrangle Map
Appendix B:	Aerial Photograph
Appendix C:	National Wetlands Inventory Map
Appendix D:	Soils Map
Appendix E:	Wetland Delineation Map
Appendix F:	Wetland Delineation Data Sheets
Appendix G:	Photographs
Appendix H:	General Project Information for a USACE Jurisdictional Determination

#### **Executive Summary**

The waters of the U.S., including wetlands, identified during this investigation for the Winding Creek Project were delineated by Bowman Consulting Group, Ltd. (BCG) according to the *Corps of Engineers' Wetlands Delineation Manual* (1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountain and Piedmont Region* (Version 2.0, April 2012) and represent those areas that are most likely within the regulatory purview of the U.S. Army Corps of Engineers (USACE). Based on the field investigations conducted in March and April, 2014, there are approximately 466 linear feet of perennial stream (R3), 1,140 linear feet of intermittent stream (R4), and 0.62 acre of palustrine forested wetlands (PFO) located within the Property limits.

#### **Property Description**

The approximately 63.1-acre Winding Creek Project area is identified as Tax Map 29, Parcels 4 and 5C, and located at 327 Winding Creek Road, approximately 0.6 mile north of its intersection with Courthouse Road in Stafford County, Virginia. The Property is generally located at 38°27'10"N Latitude and -77°26'59"W Longitude on the Stafford, VA USGS Quadrangle Map (see Appendix A for the USGS Quadrangle Map).

As shown on the Aerial Photograph included as Appendix B, the Property is generally comprised of medium-aged mixed-hardwood forest, with medium-aged coniferous forest located within the central, western, and southern portions of the Property, and an existing house in the southern portion on the eastern side of Winding Creek Road. The site is bordered by residential and forested properties to the north, east, and west, and residential, forested, and agricultural properties to the south. Winding Creek Road transects the western portion of the Property from north to south, and an existing underground utility easement transects the southern portion of the Property from east to west. The Property drains towards Austin Run, which is located within the Lower Aquia Creek watershed (PL57) of Hydrologic Unit Code (HUC) 02070011 (Lower Potomac).

#### Methodology

The Corps of Engineers Wetlands Delineation Manual (1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountain and Piedmont Region (Version 2.0, 2012) follow a three-parameter approach to identifying wetlands: hydrophytic vegetation, hydric soils, and hydrologic indicators. All three parameters normally must be present for an area to be considered a jurisdictional wetland in accordance with Section 404 of the Clean Water Act. Wetlands are then classified according to the Cowardin System, as described in *Classification of Wetlands and Deepwater Habitats of the United States* (1979). This is a hierarchical system, which aids resource managers and others by providing uniformity of concepts and terms used to define wetlands according to hydrologic, geomorphologic, chemical, and biological factors.

A preliminary evaluation of the three parameters was performed by BCG prior to the field investigation by examination of existing conditions and topographic mapping, the Stafford, VA USGS Quadrangle Map (1994), aerial photography, the U.S. Fish and Wildlife Service National Wetlands Inventory information obtained from the Wetlands Online Mapper and Data Download (*http://www.fws.gov/wetlands/data/Mapper.html*, see Appendix C for the NWI Map), and the

USDA Stafford and King George Counties, Virginia Soils Survey (USDA Natural Resources Conservation Service, Web Soil Survey 2.1, http://websoilsurvey.nrcs.usda.gov, Survey Area Data: Version 12, December 13, 2013, see Appendix D for the Soils Map). The reference information was verified by site inspections conducted by BCG on March 21, March 24, and April 2, 2014 to characterize soils, vegetation, and hydrology, and to define the boundaries of waters of the U.S., including wetlands, that may be present within the Property limits. It should be noted that the NWI Map indicates that an area of palustrine forested wetlands extends through the northern portion of the Property along Austin Run.

#### Soils:

A hydric soil is defined as a "soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part" (Federal Register, July 13, 1994). According to the USACE's Manuals, common hydric soil indicators include low chroma (chroma<2, value>4) matrix, concretions, or listing on local or national hydric soils lists. The National Hydric Soils List for Stafford and King George Counties, Virginia, published by the USDA Natural Resources Conservation Service (NRCS), was reviewed to determine if the mapped soils are classified as hydric. The USDA Stafford and King George Counties, Virginia Soils Survey maps the following soil types within the Property (see Appendix D for the Soils Map):

Map Unit	Map Unit Name	Drainage Class <sup>1</sup>	National Hydric Soils List <sup>2</sup>	Hydric Component
Ae	Alluvial land, wet	PD	Yes	Alluvial land, wet (85%)
AlB	Appling fine sandy loam, 2 to 6 percent slopes	WD	No	N/A
AlC2	Appling fine sandy loam, 6 to 15 percent slopes, eroded	WD	No	N/A
AsD	Ashlar fine sandy loam, 6 to 15 percent slopes	WD	No	N/A
BmB	Bourne fine sandy loam, 2 to 6 percent slopes	MWD	No	N/A
BmC2	Bourne fine sandy loam, 6 to 10 percent slopes, eroded	MWD	No	N/A
CaB2	Caroline fine sandy loam, 2 to 6 percent slopes, eroded	WD	No	N/A
CaC2	Caroline fine sandy loam, 6 to 10 percent slopes, eroded	WD	No	N/A
CaD2	Caroline fine sandy loam, 10 to 18 percent slopes, eroded	WD	No	N/A
CcD3	Caroline clay loam, 10 to 18 percent slopes, severely eroded	WD	No	N/A

#### Table 1: Soils Summary Table

Wetland Delineation Report

Map Unit	Map Unit Name	Drainage Class <sup>1</sup>	National Hydric Soils List <sup>2</sup>	Hydric Component
Ce	Cartecay fine sandy loam	SPD	Yes	Cartecay (85%) Alluvial land, wet (5%) Wehadkee (3%)
OrB	Orange loam, 2 to 6 percent slopes	MWD	No	N/A
TeB	Tetotum fine sandy loam, 2 to 6 percent slopes	MWD	No	N/A

 $^{1}$  MWD – Moderately Well Drained; PD – Poorly Drained; SPD – Somewhat Poorly Drained; WD – Well Drained, N/A – Not Applicable

<sup>2</sup> Per National Hydric Soils List for Stafford and King George Counties, Virginia published by USDA NRCS

During the field investigation, soil cores were taken to a depth of 12+ inches to describe soil morphological characteristics. Soil characteristics including texture, color (hue, chroma, and value), and odor were inspected for each sample. *Munsell Soil Color Charts* were used for determining the soil color. Common hydric soil indicators observed within wetlands during the field investigation included depleted matrix.

#### Vegetation:

Plant species observed on the site were identified and the wetland indicator status for each species was determined from the *Eastern Mountains and Piedmont Region – National Wetland Plant List Final Draft Ratings* (Version 2.4.0, 2012). The indicator status of a species indicates the probability that the species will occur in a wetland of the northeast region of the United States, as follows: Obligate Upland (UPL, <1%), Facultative Upland (FACU, 1-33%), Facultative (FAC, 34-66%), Facultative Wet (FACW, 67-99%), and Obligate (OBL, >99%). Normally, more than 50 percent of the dominant species must be FAC or wetter for the hydrophytic vegetation indicator to be considered satisfied.

The Winding Creek Project Area is characterized by medium-aged mixed-hardwood forest, medium-aged coniferous forest, and palustrine wetlands. Upland forested areas are dominated by white oak (*Quercus alba*), American beech (*Fagus grandifolia*), Virginia pine (*Pinus virginiana*), and princess pine (*Dendrolycopodium obscurum*). Wetland areas are dominated by sweetgum (*Liquidambar styraciflua*) and red maple (*Acer rubrum*).

#### Hydrology:

The USACE's Manuals state that wetland hydrology encompasses all hydrologic characteristics of areas that are periodically inundated or have soils that are saturated to the surface at some time during the growing season. Hydrologic indicators include, but are not limited to, sediment deposits, visual inundation, drift lines, soil erosion, and hummocking. Evidence of these indicators are present even during dry periods, and therefore are useful indicators of a wetland. Dominant hydrologic indicators observed during the field investigation included water-stained leaves, surface water , high water table, and soil saturation.

#### **Results**

Based on the field investigation, there are approximately 466 linear feet of perennial stream, 1,140 linear feet of intermittent stream, and 0.62 acre of palustrine forested wetlands located

within the Property limits. The Wetland Delineation Map included as Appendix E depicts the location and extent of the flagged waters of the U.S. and wetland boundaries located within the limits of investigation, which have been field-located by BCG using conventional survey methods. It should be noted that portions of Stream D downstream from Flags D33/D38 to the Property boundary were field-mapped, and portions of Stream H located offsite and east of the Property were field-mapped from Flags H13/H14 to its confluence with Austin Run (Stream F) near Flags F13/F14 based on available topographic and existing conditions mapping. The location of data points collected during the delineation are also included on this Map; data sheets for each data point are included as Appendix F. Representative photographs are included as Appendix G, and Appendix H contains a summary of general project information for a Jurisdictional Determination.

A maintained underground utility easement transects the southeastern portion of the Property from east to west (Photo #1). Wetland A, a linear palustrine forested wetland flagged A1/A2 through A7/A8 and measuring approximately 847 square feet (0.02 acre), is located within a topographic feature in the southern portion of the Property. Data Point DP-A3 was collected just upslope of Wetland A near Flags A1/A2 (Photo #2). This area exhibits water-stained leaves, but does not exhibit hydric soils or support hydrophytic vegetation. Data Point DP-A1 was also collected upslope of Wetland A near Flags A1/A2 and within a cleared access corridor that parallels Wetland A (Photo #3). This area does not support any of the three wetland parameters. Data Point DP-A2 was collected within Wetland A between Flags A1/A2 and A3/A4 (Photo #4). This area supports hydrophytic vegetation (red maple, sweetgum, and black gum), and exhibits water-stained leaves, surface water, and hydric soils with a depleted matrix. As shown in Photo #5, Wetland A transitions to an intermittent stream at Flags A7/A8, and flows to the east for approximately 501 linear feet. Stream A transitions to perennial flow at a headcut just downstream of Flags A29/A30 and just upstream of the confluence with Stream C, and flows to the northeast for approximately 201 linear feet before it continues offsite (Photo #6).

A topographic feature is located within the southeastern portion of the Property (Photo #7); no jurisdictional areas were identified within this feature. Wetland B, a palustrine forested wetland flagged B1/B2 through B13/B14 and measuring approximately 3,391 square feet (0.08 acre), is located further downslope within the same topographic feature. Data Point DP-B2 was collected just upslope of Wetland B near Flags B1/B2 (Photo #8). This area does not support any of the three wetland parameters. Data Point DP-B1 was collected within Wetland B near Flags B7/B8 (Photo #9). This area supports hydrophytic vegetation (red maple and sweetgum), and exhibits water-stained leaves, surface water, and hydric soils with a depleted matrix. Data Point DP-B3 was collected just downslope of Wetland B near Flags B13/B14 and upslope of Wetland C, where drainage appears to be conveyed via subsurface and/or overland sheet flow between the two wetlands (Photo #10). This area does not support any of the three wetland parameters. Wetland C, a linear palustrine forested wetland flagged C1/C2 through C9/C10 and measuring approximately 625 square feet (0.01 acre), is located just north and downslope of Wetland B. Data Point DP-C1 was collected within Wetland C near Flags C5/C6 (Photo #11). This area exhibits water-stained leaves, surface water, hydric soils with a depleted matrix, and is confined to a relatively narrow, unvegetated concave topographic feature. As shown in Photos #12 and #13, Wetland C transitions to an intermittent stream at Flags C9/C10, and flows to the east for
approximately 80 linear feet before converging with Stream A near Flags C15/C16 and A33/A34. Stream A flows offsite to the northeast near Flags A45/A46 (Photo #14).

Wetland D, a palustrine forested wetland flagged D1/D2 through D11/D16 and measuring approximately 2,513 square feet (0.06 acre), is located within a topographic feature in the north-central portion of the Property. Data Point DP-D2 was collected just upslope of Wetland D near Flags D1/D2 (Photo #15). This area does not support any of the three wetland parameters. Data Point DP-D1 was collected within Wetland D near Flags D3/D4 (Photo #16). This area supports hydrophytic vegetation (red maple, slippery elm, and sweetgum), and exhibits water-stained leaves, surface water, and hydric soils with a depleted matrix. Data Point DP-UPL1 was collected within a side topographic feature upslope and west of Wetland D (Photo #17). This area exhibits surface water, but does not exhibit hydric soils or a defined stream channel, or support hydrophytic vegetation. Wetland D transitions to an intermittent stream flagged D11/D16 through D33/D38 and measuring approximately 503 linear feet at a headcut near Flags D11/D16 (Photo #18). Photo #19 provides a representative view of Stream D from near Flags D15/D20. A second side topographic feature is located just upslope of Stream D near Flag D27 (Photo #20); no jurisdictional areas were identified within this feature. Stream D flows offsite to the north near Flags D33/D38 (Photo #21). Wetland E, a linear palustrine forested wetland flagged E1/E2 through E9/E10 and measuring approximately 533 square feet (0.01 acre) within the Property limits, is located within a topographic feature just east of Stream D. Data Point DP-E1 was collected just upslope of Wetland E near Flags E1/E2 (Photo #22). This area exhibits hydric soils with a depleted matrix, but does not exhibit wetland hydrology or a defined stream channel, or support hydrophytic vegetation. Data Point DP-E2 was collected within Wetland E near Flags E1/E2 (Photo #23). This area exhibits water-stained leaves, surface water, hydric soils with a depleted matrix, and is confined to a relatively narrow, unvegetated concave topographic feature. Wetland E continues to the north and offsite near Flags E7/E8 (Photo #24).

Data Point DP-UPL5 was collected within a topographic feature in the northwestern portion of the Property near Winding Creek Road (Photo #25). This area does not support any of the three wetland parameters. Data Point DP-UPL3 was collected within a topographic feature in the north-central portion of the Property (Photo #26). This area exhibits soil saturation, but does not exhibit hydric soils or a defined stream channel, or support hydrophytic vegetation. Data Point DP-UPL2 was collected within a topographic feature just offsite and east of the northern portion of the Property (Photo #27). This area exhibits a high water table and soil saturation, but does not exhibit hydric soils, a defined stream channel, or hydrophytic vegetation.

Austin Run (Stream F), a perennial stream flagged F1/F2 through F13/F14 and measuring approximately 226 linear feet within the Property limits, flows onto the Property near Flags F5/F6 (Photo #28). Data Point DP-F1 was collected within the Austin Run floodplain near Flag F10 (Photo #29). This area does not support any of the three wetland parameters. Photos #30 and #31 provide representative views of Austin Run (Stream F) from near Flags F11/F12 and Flags F13/F14, respectively. Stream H, an intermittent stream flagged H1/H2 through H13/H14 and measuring approximately 56 linear feet within the Property limits, originates from offsite and north of the Property (Photo #32). Portions of Stream H did not exhibit flow within the stream channel during the site investigation (Photo #33). Stream H continues to flow offsite and parallel to the Property's eastern boundary within a maintained lawn area (Photo #34). As shown in

Photo #35, Stream H converges with Austin Run (Stream F) offsite and east of the Property near Flags F13/F14.

Winding Creek Road transects the western portion of the Property from north to south (Photo #36). A maintained utility easement transects the southwestern portion of the Property from east to west (Photo #37). Wetland G, a palustrine forested wetland flagged G1/G2 through G29/G38 and measuring approximately 19,095 square feet (0.44 acre) within the Property limits, is located within the southwestern portion of the Property (Photo #38). Data Point DP-G3 was collected within Wetland G near Flags G16/G18 (Photo #39). This area supports hydrophytic vegetation (red maple and sweetgum), and exhibits water-stained leaves, surface water, and hydric soils with a depleted matrix. Data Point DP-G2 was collected just upslope of Wetland G near Flag G32 (Photo #40). This area does not support any of the three wetland parameters. Data Point DP-G1 was collected within Wetland G just offsite to the west near Flags G34/G36 (Photo #41). This area supports hydrophytic vegetation (red maple and sweetgum), and exhibits with a depleted matrix. Data Point DP-UPL4 was collected within a topographic feature north of Wetland G (Photo #42). This area exhibits a high water table and soil saturation, but does not exhibit hydric soils or hydrophytic vegetation.

The following table summarizes the data points that were collected by BCG during the field investigation:

Data Point	Mapped Soil Unit	Hydrophytic Vegetation	Hydric Soils	Wetland Hydrology	Community ID
DP-A1	TeB	No	No	No	Upland
DP-A2	TeB	Yes	Yes	Yes	PFO Wetland
DP-A3	TeB	No	No	Yes	Upland
DP-B1	TeB	Yes	Yes	Yes	PFO Wetland
DP-B2	TeB	No	No	No	Upland
DP-B3	TeB	No	No	No	Upland
DP-C1	TeB	Yes	Yes	Yes	PFO Wetland
DP-D1	CaC2	Yes	Yes	Yes	PFO Wetland
DP-D2	CaC2	No	No	No	Upland
DP-E1	Ae	No	Yes	No	Upland
DP-E2	Ae	Yes	Yes	Yes	PFO Wetland
DP-F1	Ce	No	No	No	Upland Floodplain
DP-G1	OrB	Yes	Yes	Yes	PFO Wetland
DP-G2	OrB	No	No	No	Upland
DP-G3	OrB	Yes	Yes	Yes	PFO Wetland
DP-UPL1	AlC2	No	No	Yes	Upland
DP-UPL2	AsD	No	No	Yes	Upland

 Table 2: Data Point Summary Table

Data Point	Mapped Soil Unit	Hydrophytic Vegetation	Hydric Soils	Wetland Hydrology	Community ID
DP-UPL3	Ce	No	No	Yes	Upland
DP-UPL4	OrB	No	No	Yes	Upland
DP-UPL5	AsD	No	No	No	Upland

The following table summarizes the waters of the U.S. and wetlands that were delineated within the limits of investigation for the Winding Creek Project:

#### Table 3: Waters of the U.S. and Wetlands Summary Table<sup>1</sup>

Classification <sup>2</sup>	Length (LF)	Area (SF)	Area (Ac)
Perennial Streams (R4)	466	N/A	N/A
Intermittent Streams (R4)	1,140	N/A	N/A
Palustrine Forested Wetlands (PFO)	N/A	27,004	0.62
Total Waters of the U.S.	1,606	27,004	0.62

<sup>1</sup> The amount of waters of the U.S. and wetlands indicated in the table reflects the amount located within the Property boundaries.

<sup>2</sup> Stream classifications are based on field assessments by BCG in March and April, 2014 using the NCDWQ Stream Classification Method (Version 4.11, September 2010), as approved for use by Stafford County.

The Wetland Delineation Map included as Appendix E reflects the flagged waters of the U.S. and wetland boundaries that were delineated and flagged in the field by BCG in March and April, 2014 and field-located in April 2014. The boundaries should be considered preliminary until they have been approved by the USACE during a Jurisdictional Determination site visit (see Appendix H for a summary of information for a USACE Jurisdictional Determination).

Appendix A

USGS Quadrangle Map

#### Attachment 11 Page 81 of 185



Appendix B

**Aerial Photograph** 



Scale: 1"=400'



Bowman Consulting Group, Ltd. 14020 Thunderbolt Place Suite 300 Chantilly, Virginia 20151

Bowman Consulting Group, Ltd.

Phone: (703) 464-1000 Fax: (703) 481-9720 www.bowmanconsulting.com Source: ArcGIS (2014)

Aerial Photograph Winding Creek 38°27'10"N, -77°26'59"W Stafford, VA USGS Quadrangle Map PL57 (Lower Aquia Creek), HUC 02070011 (Lower Potomac) Stafford County, Virginia

Prepared for: Winding Creek Owner, LLC 15256 Welton Court Centreville, Virginia 20120

Appendix C

National Wetlands Inventory Map



**User Remarks:** 

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

Appendix D

Soils Map

Attachment 11 Page 87 of 185





# Map Unit Legend

	Stafford and King George Counties, Virginia (VA179)							
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI					
Ae	Alluvial land, wet	2.3	3.5%					
AIB	Appling fine sandy loam, 2 to 6 percent slopes	3.6	5.4%					
AIC2	Appling fine sandy loam, 6 to 15 percent slopes, eroded	2.7	4.0%					
AsD	Ashlar fine sandy loam, 6 to 15 percent slopes	5.9	8.9%					
BmB	Bourne fine sandy loam, 2 to 6 percent slopes	10.5	15.9%					
BmC2	Bourne fine sandy loam, 6 to 10 percent slopes, eroded	4.3	6.5%					
CaB2	Caroline fine sandy loam, 2 to 6 percent slopes, eroded	1.6	2.4%					
CaC2	Caroline fine sandy loam, 6 to 10 percent slopes, eroded	11.9	18.0%					
CaD2	Caroline fine sandy loam, 10 to 18 percent slopes, eroded	2.2	3.4%					
CcD3	Caroline clay loam, 10 to 18 percent slopes, severely eroded	6.1	9.3%					
Се	Cartecay fine sandy loam	1.3	2.0%					
OrB	Orange loam, 2 to 6 percent slopes	6.7	10.2%					
ТеВ	Tetotum fine sandy loam, 2 to 6 percent slopes	7.0	10.5%					
Totals for Area of Interest		66.0	100.0%					

Appendix E

Wetland Delineation Map

# Appendix F

## Wetland Delineation Data Sheets

Attachment 11 Page 92 of 185

#### WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site. Winding Creek	City/County Stafford County Sampling Date: March 21, 2014
Applicant/Owner: Winding Creek Owner, LLC	State: Virginia Sampling Point: DP-A1
Investigator(s). S. Gagnon & J. Muller	Section, Township, Range:
Landform (billslope, terrace, etc.). Terrace	cal relief (concave, convex, none). None Slope (%): 3%
Subregion (LRR or MLRA): LRR P	84 Long: 11783513.4377 Datum: NAD83
Soll Mon Linit Name. TeB. Tetotum fine sandy loam. 2 to 6 percent	cent slopes
Are climatic / bydrologic conditions on the site typical for this time of y	ear? Ves X No (If no explain in Remarks )
Are Vergetation Soil or the site typical of this time of y	
Are Vegetation, Soil, or Hydrologysignificanti	reblemetic? (If peeded, explain any appropriate present? Fes No
	obientatic? (in needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing	g sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No	- Is the Sempled Area
Hydric Soil Present? Yes No X	- within a Wetland? Yes No X
Wetland Hydrology Present? Yes NoX	
Remarks:	
Data Point DP-A1 was collected just upslope of	of Wetland A near Flags A1/A2, and within a cleared
access corridor that parallels Wetland A.	
	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (R6)
Surface Water (A1) True Aquatic F	Plants (B14) Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)	ide Odor (C1) Drainage Patterns (B10)
Saturation (A3) Oxidized Rhize	ospheres on Living Roots (C3) Moss Trim Lines (B16)
Water Marks (B1) Presence of R	educed Iron (C4) Dry-Season Water Table (C2)
Sediment Deposits (B2) Recent Iron Re	eduction in Tilled Soils (C6) Crayfish Burrows (C8)
Drift Deposits (B3) Thin Muck Sur	face (C7) Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Other (Explain	in Remarks) Stunted or Stressed Plants (D1)
Iron Deposits (B5)	Geomorphic Position (D2)
Water Stained Leaves (R0)	Shallow Aquitard (D3)
Aquatic Fauna (B13)	FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes No × Depth (inches	s):
Water Table Present? Yes No X Depth (inches	s):
Saturation Present? Yes No X Depth (inches	s): Wetland Hydrology Present? Yes NoX
(includes capillary fringe)	
Describe Recorded Data (stream gauge, monitoring well, aerial prot	os, previous inspections), ir available:
Remarks:	

Attachment 11 Page 93 of 185

# **VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: DP-A1

	Absolute	Dominant I	ndicator	Dominance Test worksheet:	
Tree Stratum (Plot size: 30 feet )	% Cover	Species?	Status	Number of Dominant Species	
<sub>1.</sub> Liriodendron tulipifera	50	Yes	FACU	That Are OBL. FACW. or FAC:	1 (A)
2 Pinus virginiana	50	Yes	UPL		( )
Acer rubrum	10	No	FAC	Total Number of Dominant	7 (D)
3				Species Across All Strata:	<u> </u>
4				Percent of Dominant Species	
5				That Are OBL, FACW, or FAC:	(A/B)
6				Provolonco Index workshoot	
7				Frevalence index worksheet.	
8				lotal % Cover of:	Multiply by:
	110	= Total Cove	r	OBL species :	< 1 =
Sapling/Shrub Stratum (Plot size: 30 feet )				FACW species 2	x 2 =
<sub>1.</sub> Vaccinium sp.	10	No	N/A	FAC species	к 3 =
2. Acer rubrum	20	Yes	FAC	FACU species :	x 4 =
3. Ilex opaca	20	Yes	FACU	UPL species	x 5 =
A Fagus grandifolia	20	Yes	FACU	Column Totals: (	A) (B)
 ⊾ Carva alba	10	No	UPL		(-)
<u>5. ca.ya anza</u>				Prevalence Index = B/A =	=
6		·		Hydrophytic Vegetation Indic	ators:
7				1 - Rapid Test for Hydroph	vtic Vegetation
8					0/.
9					70 0 <sup>1</sup>
10				3 - Prevalence Index is ≤3.	0
	80	= Total Cove	r	4 - Morphological Adaptatio	ons' (Provide supporting
Herb Stratum (Plot size: 15 feet )				data in Remarks or on a	a separate sheet)
1. Dendrolycopodium obscurum	5	Yes	FACU	Problematic Hydrophytic V	egetation <sup>1</sup> (Explain)
2. Ilex opaca	5	Yes	FACU		
3 Polystichum acrostichoides	2	No	FACU	<sup>1</sup> Indicators of hydric soil and we	atland hydrology must
4				be present, unless disturbed or	problematic.
4				Definitions of Four Vegetatio	n Strata:
5		·			
6		·		Tree – Woody plants, excluding	J vines, 3 in. (7.6 cm) or
7				height.	ni (DDH), regardiess of
8				5	
9				Sapling/Shrub – Woody plants	, excluding vines, less
10				m) tall.	1 01 equal to 5.26 It (1
11.				,	
12				Herb – All herbaceous (non-wo	ody) plants, regardless
	12	- Total Cove		or size, and woody plants less i	nan 3.26 it tall.
Woody Vine Stratum (Plot size: 30 feet )	·	- 101010000	1	Woody vine – All woody vines	greater than 3.28 ft in
1 Toxicodendron radicans	2	No	FAC	height.	
2					
2 2					
3					
4				Hydronbytic	
5				Vegetation	
6				Present? Yes	NoX
	2	= Total Cove	r		
Remarks: (Include photo numbers here or on a separate	sheet.)				
	/				

Profile Desc	ription: (Describe	to the de	oth needed to docu	ment the	indicator	or confirm	n the absence	of indicator	·s.)	
Depth	Matrix		Redo	x Feature	<u>s</u>	2				
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture		Remarks	
0-3	10YR 4/3	100				·	silt loam			
3-7	2.5Y 5/4	98	10YR 5/8	2	С	Μ	silt loam	faint mott	les	
7-15	2.5Y 5/4	95	10YR 5/8	5	С	Μ	sandy clay			
		·								
		·				·				
		·				. <u></u>				
		·				·				
1							2			<u> </u>
'Type: C=Co	oncentration, D=Dep	letion, RN	l=Reduced Matrix, M	S=Masked	d Sand Gr	ains.	Location: Pl	L=Pore Lining	g, M=Matrix.	
Hydric Soli I	ndicators:			(0-)			Indic	ators for Pro	biematic Hydi	ric Solis :
Histosol	(A1)		Dark Surface	e (S7) Have Courfe	aa (CO) <b>(</b>		2	cm Muck (A	10) <b>(MLRA 147</b> Dedau (A4C)	0
HISTIC Ep	olpedon (A2)		Polyvalue Be	elow Surra	Ce (58) (N	AT 440)	, 148) (		Redox (A16)	
	siic (A3) n Sulfide (A1)			anace (39		147, 140)		(IVILKA 14/ Diedmont Floc	, 140) Idolaio Soile (F	(10)
Trydroge			Depleted Ma	triv (F3)	(12)		'	(MI RA 136	147)	13)
0.ratilieu	r Eayers (A3) ck (A10) <b>(I RR N)</b>		Bedox Dark	Surface (F	-6)		N.	/erv Shallow	, 1477 Dark Surface (1	TF12)
2 cm wa	Below Dark Surface	e (A11)	Depleted Da	rk Surface	e (F7)			)ther (Explain	in Remarks)	11 12)
Thick Da	ark Surface (A12)		Redox Depre	essions (F	8)					
Sandv M	luckv Mineral (S1) <b>(I</b>	.RR N.	Iron-Mangan	ese Mass	es (F12) <b>(</b>	LRR N.				
MLRA	147, 148)	,	MLRA 13	6)		,				
Sandy G	leyed Matrix (S4)		Umbric Surfa	, ace (F13)	(MLRA 13	6, 122)	<sup>3</sup> Inc	licators of hyd	drophytic veget	ation and
Sandy R	edox (S5)		Piedmont Flo	odplain S	ioils (F19)	(MLRA 14	<b>48)</b> we	etland hydrolo	ogy must be pre	esent,
Stripped	Matrix (S6)		Red Parent I	Material (F	21) (MLR	A 127, 14	<b>7)</b> un	less disturbe	d or problemati	ic.
Restrictive I	ayer (if observed):									
Type:										
Depth (ind	ches):						Hydric Soil	Present?	Yes	No _ X
Remarks:							-			

Attachment 11 Page 95 of 185

#### WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Winding Creek		Citv/C	ounty: Stafford Cou	inty	Sampling Date: March 21, 201	14
Applicant/Owner: Winding Cr	eek Owner, LLC			<sub>State:</sub> Virginia	Sampling Point: DP-A2	
Investigator(s). S. Gagnon &	J. Muller	Sectio	on, Township, Range:			
Landform (hillslope terrace etc	). Drainage featu	Ire Local reli	ef (concave, convex	none). Concave	Slope (%): 3%	
Subregion (LRR or MLRA). LR	.R.P 1	at. 6848912.7623	Long: 1	1783512.0605	Octum: NAD83	_
Soil Man Linit Name. TeB. Tel	totum fine sandv l	oam. 2 to 6 percent sl	opes	NIW/L close	Datum. 10.000	
Are elimetic / hudrels sis condition		al fan thia tinna af waar0. M	X Na			
Are climatic / nyarologic conditio		al for this time of year? Y			emarks.)	
Are Vegetation, Soil	, or Hydrology	significantly distur	bed? Are "Norr	nal Circumstances" p	resent? Yes <u>^</u> No	_
Are Vegetation, Soil	, or Hydrology _	naturally problema	atic? (If neede	d, explain any answei	's in Remarks.)	
SUMMARY OF FINDING	S – Attach site	map showing sam	pling point loca	tions, transects	, important features, etc.	-
Hydrophytic Vegetation Prese Hydric Soil Present? Wetland Hydrology Present? Remarks:	nt? Yes 2 Yes 2 Yes 2	K No K No K No	Is the Sampled Are within a Wetland?	a Yes <u>X</u>	No	_
Data Point DP-A2 wa	as collected w	vithin Wetland A	between Flags	A1/A2 and A3	}/A4.	
HYDROLOGY						
Wetland Hydrology Indicato	rs:			Secondary Indica	tors (minimum of two required)	7
Primary Indicators (minimum o	of one is required; ch	neck all that apply)		Surface Soil	Cracks (B6)	
X Surface Water (A1)	-	True Aquatic Plants (	B14)	Sparsely Veg	jetated Concave Surface (B8)	
High Water Table (A2)	-	Hydrogen Sulfide Ode	or (C1)	Drainage Pat	terns (B10)	
X Saturation (A3)	-	Oxidized Rhizosphere	es on Living Roots (C	3) Moss Trim Li	nes (B16)	
Water Marks (B1)	-	Presence of Reduced	l Iron (C4)	Dry-Season \	Nater Table (C2)	
Sediment Deposits (B2)	-	Recent Iron Reductio	n in Tilled Soils (C6)	Crayfish Burr	ows (C8)	
Drift Deposits (B3)	-	Thin Muck Surface (C	(7)	Saturation Vi	sible on Aerial Imagery (C9)	
Algal Mat or Crust (B4)	-	Other (Explain in Ren	narks)	Stunted or St	ressed Plants (D1)	
Iron Deposits (B5)				Geomorphic	Position (D2)	
Water Stained Leaves (P)	al imagery (B7)			Shallow Aqui	tard (D3)	
Aquatic Fauna (B13)	3)			FAC-Neutral	Test (D5)	
Field Observations:					. ,	-
Surface Water Present?	Yes × No	Depth (inches): 1 in	ch			
Water Table Present?	Yes No	Markov Content Cont				
Saturation Present?	Yes X No	Depth (inches): 2 in	ches Wetlan	d Hydrology Presen	t? Yes <u>×</u> No	
Describe Recorded Data (stre	am gauge, monitorir	ng well, aerial photos, pre	vious inspections), if a	available:		-
Remarks:						_
Komano.						

Attachment 11 Page 96 of 185

## VEGETATION (Four Strata) - Use scientific names of plants.

00 ( )	Absolute	Dominant	Indicator	Dominance Test worksheet:
ree Stratum (Plot size: <u>30 feet</u> )	% Cover	Species?	Status	Number of Dominant Species
Acer rubrum	10	Yes	FAC	That Are OBL, FACW, or FAC: <u>3</u> (A)
Nyssa sylvatica	10	Yes	FAC	Total Number of Dominant
				Species Across All Strata: <u>3</u> (B)
		. <u> </u>		Deveent of Deminent Creation
		. <u> </u>		That Are OBL, FACW, or FAC: <sup>100%</sup> (A/E
				Prevalence Index worksheet:
				Total % Cover of: Multiply by:
	20	= Total Cove	er	OBL species x 1 =
apling/Shrub Stratum (Plot size: 30 feet )				FACW species x 2 =
Nyssa sylvatica	5	Yes	FAC	FAC species x 3 =
Vaccinium sp.	1	No	N/A	FACU species x 4 =
				UPL species x 5 =
				Column Totals: (A) (B
				Prevalence Index = B/A =
		·	·	Hydrophytic Vegetation Indicators:
		·		1 - Rapid Test for Hydrophytic Vegetation
		·		$\times$ 2 - Dominance Test is >50%
		·		3 - Prevalence Index is ≤3.0 <sup>1</sup>
J	6			4 - Morphological Adaptations <sup>1</sup> (Provide supportir
erb Stratum (Plot size: 15 feet )	0	= Total Cove	er	data in Remarks or on a separate sheet)
//////////////////////////////////////				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
		·		
·		·		<sup>1</sup> Indicators of hydric soil and wetland hydrology must
·		·		be present, unless disturbed or problematic.
		·	<u> </u>	Definitions of Four Vegetation Strata:
		·		Tree Mondy plants evoluting vince 2 in (7.6 cm)
·		·		more in diameter at breast height (DBH). regardless of
·		·		height.
		·		Sanling/Shrub - Woody plants, excluding vines, less
		·		than 3 in. DBH and greater than or equal to 3.28 ft (1
0		·		m) tall.
1		·		Herb – All berbaceous (non-woody) plants, regardless
2		·		of size, and woody plants less than 3.28 ft tall.
(and w) (inc. Stratum (Dist size, 30 feet )	0	= Total Cove	er	Woody vine All woody vince greater than 2.28 ft in
(Plot size)				height.
		·		
		·		
. <u> </u>				
		·		
		·		Hydrophytic
  		·		Hydrophytic Vegetation
   		·		Hydrophytic Vegetation Present? Yes <u>×</u> No

SOIL								Sampling Point:
Profile Des	cription: (Descri	be to the de	pth needed to docu	ment the ir	ndicator	or confirn	n the absence	e of indicators.)
Depth	Matriz	x	Redo	ox Features	;			
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-2	2.5Y 5/3	95	10YR 4/4	5	С	Μ	sandy clay	saturated
2-12+	2.5Y 6/2	98	10YR 5/6	2	С	Μ	sandy clay	
· · · · · · · · · · · · · · · · · · ·			· .	·		·		
				·		·	·	
		·		·		·	·	
	<u></u>			·		·	·	
	<u></u>					·		
	<u> </u>							
		Depletion RM	-Reduced Matrix M	S-Maskad	Sand Gr	aine	<sup>2</sup> Location: Pl	-Pore Lining M-Matrix
Hydric Soil	Indicators:			IO-Maskeu	Sanu Or	ams.	Indic	ators for Problematic Hydric Soils <sup>3</sup> :
Histoso	l (A1)		Dark Surfac	e (S7)			2	2 cm Muck (A10) <b>(MLRA 147)</b>
Histic E	pipedon (A2)		Polyvalue B	elow Surfac	e (S8) <b>(N</b>	ILRA 147,	, <b>148)</b>	Coast Prairie Redox (A16)
Black H	listic (A3)		Thin Dark S	urface (S9)	(MLRA	47, 148)		(MLRA 147, 148)
Hydrog	en Sulfide (A4)		Loamy Gley	ed Matrix (F	-2)		P	Piedmont Floodplain Soils (F19)
Stratifie	ed Layers (A5)		× Depleted Ma	atrix (F3)				(MLRA 136, 147)
2 cm M	uck (A10) (LRR N	) faco (A11)	Redox Dark	Surface (F)	6) (FZ)		V	/ery Shallow Dark Surface (TF12)
Depiete Thick D	ark Surface (A12)	lace (ATT)	Depieted Da	essions (F8	( <i>Г1)</i>			oner (Explain in Remarks)
Sandy I	Mucky Mineral (S1	) (LRR N.	Iron-Mangar	rese Masse	'' es (F12) <b>(</b>	LRR N.		
MLR	A 147, 148)	, (,	MLRA 13	36)		,		
Sandy	Gleyed Matrix (S4)	)	Umbric Surfa	ace (F13) <b>(</b>	MLRA 13	6, 122)	<sup>3</sup> Ind	licators of hydrophytic vegetation and
Sandy	Redox (S5)		Piedmont FI	oodplain So	oils (F19)	(MLRA 14	<b>48)</b> we	etland hydrology must be present,
Strippe	d Matrix (S6)		Red Parent	Material (F2	21) <b>(MLR</b>	A 127, 14	<b>7)</b> un	less disturbed or problematic.
Restrictive	Layer (if observe	ed):						
Type:								
Depth (ir	nches):						Hydric Soil	Present? Yes X No
Remarks:								

Attachment 11 Page 98 of 185

#### WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site. Winding Creek	City/County Stafford County Sampling Date: April 2, 2014
Applicant/Owner: Winding Creek Owner, LLC	ethics and
Investigator(c). J. Fleming & S. Gagnon	Section Township Pages:
	Section, Township, Kange
Landform (hillslope, terrace, etc.): <u>Depression</u> 68/188/	_ Local relief (concave, convex, none): Slope (%): Slope (%):
Subregion (LRR or MLRA): LRK F Lat: 004004	9.0547 Long: 11705472.1287 Datum: NAD83
Soil Map Unit Name: TEB, Tetotum fine sandy loam, 2 to 6	percent slopes NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time	e of year? Yes <u>^</u> No (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology signific	cantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation, Soil, or Hydrology natura	ally problematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map sho	wing sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present?       Yes No         Hydric Soil Present?       Yes No         Wetland Hydrology Present?       Yes No         Remarks:       Yes No	X     Is the Sampled Area       within a Wetland?     Yes NoX
Data Point DP-A3 was collected just upslo	pe of Wetland A near Flags A1/A2.
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that a	pply) Surface Soil Cracks (B6)
Surface Water (A1) True Aqu	atic Plants (B14) Sparsely Vegetated Concave Surface (B8)
High Water Table (A2) Hydroger	n Sulfide Odor (C1) Drainage Patterns (B10)
Saturation (A3) Oxidized	Rhizospheres on Living Roots (C3) Moss Trim Lines (B16)
Water Marks (B1) Presence	of Reduced Iron (C4) Dry-Season Water Table (C2)
Sediment Deposits (B2) Recent In	on Reduction in Tilled Soils (C6) Crayfish Burrows (C8)
Drift Deposits (B3) Thin Muc	k Surface (C7) Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Other (Ex	(plain in Remarks) Stunted or Stressed Plants (D1)
Iron Deposits (B5)	Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	Snallow Aquitard (D3)
Aquatic Fauna (B13)	Microtopographic Relief (D4)
Aqualic Faulta (B13)	
Surface Water Present? Voc No X Dopth (ii	achae).
Water Table Present? Ves No X Depth (in	nches):
Saturation Present? Yes No × Depth (in	nches): Wetland Hydrology Present? Yes X No
(includes capillary fringe)	nhotee provisus inspections) if evollable:
Describe Recorded Data (stream gauge, monitoring weil, aenai	protos, previous inspections), il available.
Remarks:	

Attachment 11 Page 99 of 185

## **VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: DP-A3

	Absolute	Dominant	Indicator	Dominance Test worksheet:	
Tree Stratum (Plot size: 30 feet )	% Cover	Species?	Status	Number of Dominant Species	
1. Liriodendron tulipifera	50	Yes	FACU	That Are OBL, FACW, or FAC	: <u>1</u> (A)
<sub>2.</sub> Pinus virginiana	50	Yes	UPL	Total Number of Dominant	
<sub>3.</sub> Acer rubrum	10	No	FAC	Species Across All Strata:	7 (B)
4					、,
5				That Are OBL FACW or FAC	. 14% (A/B)
6.					(//////
7.				Prevalence Index worksheet	:
8.				Total % Cover of:	Multiply by:
	110	= Total Cove	er	OBL species	x 1 =
Sapling/Shrub Stratum (Plot size: 30 feet )				FACW species	x 2 =
<sub>1.</sub> Vaccinium sp.	2	No	N/A	FAC species	x 3 =
2. Acer rubrum	20	Yes	FAC	FACU species	x 4 =
3. Ilex opaca	20	Yes	FACU	UPL species	x 5 =
4. Fagus grandifolia	20	Yes	FACU	Column Totals:	(A) (B)
5. Liquidambar styraciflua	10	No	FAC		.,,
6				Prevalence Index = B/A	=
7		·		Hydrophytic Vegetation Indi	cators:
8				1 - Rapid Test for Hydroph	nytic Vegetation
0				2 - Dominance Test is >50	)%
9				3 - Prevalence Index is ≤3	.0 <sup>1</sup>
10:	72	Total Caur		4 - Morphological Adaptat	ions <sup>1</sup> (Provide supporting
Herb Stratum (Plot size: <sup>15 feet</sup> )	<u> </u>		÷1	data in Remarks or on	a separate sheet)
1. Dendrolycopodium obscurum	10	Yes	FACU	Problematic Hydrophytic \	/egetation <sup>1</sup> (Explain)
2 Ilex opaca	2	No	FACU		
3 Polystichum acrostichoides	5	Yes	FACU	<sup>1</sup> Indicators of hydric soil and w	etland hydrology must
4				be present, unless disturbed o	r problematic.
5		·		Definitions of Four Vegetation	on Strata:
6.				Tree – Woody plants, excludin	navines 3 in (7.6 cm) or
7				more in diameter at breast hei	ght (DBH), regardless of
۰ ٥				height.	
8				Sapling/Shrub – Woody plant	s. excluding vines, less
9			·	than 3 in. DBH and greater that	in or equal to 3.28 ft (1
10				m) tall.	
11				Herb – All herbaceous (non-w	oody) plants, regardless
12	12			of size, and woody plants less	than 3.28 ft tall.
Woody Vine Stratum (Plot size: 30 feet )	12	= Total Cove	er	Woody vine – All woody vines	s greater than 3.28 ft in
1				height.	gioator than oizo it in
1					
2					
S					
4				Hydrophytic	
5				Vegetation	
6				Present? Yes	NoX
	0	= Total Cove	er		
Remarks: (Include photo numbers here or on a separate	sheet.)			•	

SUL										
Profile Des	cription: (Descri	be to the de	pth needed to docu	iment the	indicator	or confiri	m the absence	e of indicators.)		
Depth	Matrix									
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks		
0-3	10YR 4/3	100					silt loam			
3-7	2.5Y 5/4	98	10YR 5/8	2	С	Μ	silt loam	faint mottles		
7-15	2.5Y 5/4	95	10YR 5/8	5	С	Μ	sandy clay			
						·				
						·				
				<u> </u>		·				
<sup>1</sup> Type: C=C	concentration, D=D	Depletion, RN	A=Reduced Matrix, N	1S=Maske	d Sand Gr	ains.	<sup>2</sup> Location: P	L=Pore Lining, M=Matrix.		
Hydric Soil	Indicators:						Indic	ators for Problematic Hydric Soils <sup>3</sup> :		
Histoso	l (A1)		Dark Surfac	e (S7)			2	2 cm Muck (A10) <b>(MLRA 147)</b>		
Histic E	pipedon (A2)		Polyvalue B	elow Surf	ace (S8) <b>(N</b>	ILRA 147	', 14 <b>8)</b> (	Coast Prairie Redox (A16)		
Black H	listic (A3)		Thin Dark S	Surface (SS	9) <b>(MLRA</b> 1	47, 148)		(MLRA 147, 148)		
Hydroge	en Sulfide (A4)		Loamy Gley	ed Matrix	(F2)		Piedmont Floodplain Soils (F19)			
Stratifie	d Layers (A5)		Depleted M	atrix (F3)			(MLRA 136, 147)			
2 cm M	uck (A10) (LRR N	)	Redox Dark	Surface (	F6)		\	Very Shallow Dark Surface (TF12)		
Deplete	d Below Dark Sur	face (A11)	Depleted Date	ark Surfac	e (F7)		Other (Explain in Remarks)			
Thick D	ark Surface (A12)		Redox Dep	ressions (I	F8)					
Sandy M	Mucky Mineral (S1	) <b>(LRR N,</b>	Iron-Manga	nese Mas	ses (F12) <b>(</b>	LRR N,				
MLR.	A 147, 148)	\	MLRA 1	36)		6 400)	<sup>3</sup> In a	diasters of hydrophytic vegetation and		
Sandy C	Gleyed Matrix (54,	)	Umbric Sun Biodmont E	ace (F13)	(MILKA 13 Soile (E10)	(MIDA 1	19) Inc	attand hydrology must be present		
Stripper	d Matrix (S6)		Red Parent	Material (	F21) (MLR	A 127. 14	-7) ur	aless disturbed or problematic.		
Restrictive	Laver (if observe	ed):		(inatonal (	) (					
Type:										
Depth (inches):							Hydric Soi	I Present? Yes <u>No X</u>		
Remarks:	,						-			

Attachment 11 Page 101 of 185

#### WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

	City/County Stafford Count	tv Sampling Data: March 21, 2014				
And Konstein Winding Creek Owner, LLC		Sampling Date: March 21, 2014				
Applicant/Owner: Minding Crock Conner, 220		State: Sampling Point:				
Investigator(s): <u>0. Original destination</u>	Section, Township, Range: _	Capacita				
Landform (hillslope, terrace, etc.): Depression	Local relief (concave, convex, no	Slope (%): <u>1%</u>				
Subregion (LRR or MLRA): LRR P Lat: 682	18831.8317 Long: 117	784021.9349 Datum: NAD83				
Soil Map Unit Name: <u>TeB</u> , Tetotum fine sandy loam, 2	to 6 percent slopes	NWI classification: N/A				
Are climatic / hydrologic conditions on the site typical for this	s time of year? Yes X No	(If no, explain in Remarks.)				
Are Vegetation, Soil, or Hydrologys	ignificantly disturbed? Are "Norma	al Circumstances" present? Yes 🗙 No				
Are Vegetation, Soil, or Hydrology n	aturally problematic? (If needed,	explain any answers in Remarks.)				
SUMMARY OF FINDINGS – Attach site map	showing sampling point location	ons, transects, important features, etc.				
Hydrophytic Vegetation Present?       Yes       X       N         Hydric Soil Present?       Yes       X       N         Wetland Hydrology Present?       Yes       X       N	0     Is the Sampled Area       0     within a Wetland?	Yes X No				
HYDROLOGY						
Wetland Hydrology Indicators:	hot opply)	Secondary Indicators (minimum of two required)				
Surface Water (A1)     True	Aquatic Plants (P14)	Sparsely Vegetated Canceyo Surface (BR)				
High Water Table (A2)	rogen Sulfide Odor (C1)	Sparsely vegetated Concave Surface (B8)				
Saturation (A3) Oxic	lized Rhizospheres on Living Roots (C3)	ts (C3) Moss Trim Lines (B16)				
Water Marks (B1) Pres	sence of Reduced Iron (C4)	Dry-Season Water Table (C2)				
Sediment Deposits (B2)	ent Iron Reduction in Tilled Soils (C6)	Crayfish Burrows (C8)				
Drift Deposits (B3) Thin	Muck Surface (C7)	Saturation Visible on Aerial Imagery (C9)				
Algal Mat or Crust (B4) Othe	er (Explain in Remarks)	Stunted or Stressed Plants (D1)				
Iron Deposits (B5)		Geomorphic Position (D2)				
Inundation Visible on Aerial Imagery (B7)		Shallow Aquitard (D3)				
▲ Water-Stained Leaves (B9)		Microtopographic Relief (D4)				
Field Observations:	Ι					
Field Observations:	oth (inchos): 1 inch					
Water Table Present? Yes No De	oth (inches):					
		1				
Saturation Present? Ves No X Do	th (inches): Wotland	Hydrology Present? Yes X No				
Saturation Present? Yes No _X Dep (includes capillary fringe)	oth (inches): Wetland	Hydrology Present? Yes X No				

Remarks:

Attachment 11 Page 102 of 185

## **VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: DP-B1

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 feet )	% Cover	Species?	Status	Number of Dominant Species
1. Acer rubrum	60	Yes	FAC	That Are OBL, FACW, or FAC: $2$ (A)
<sub>2.</sub> Nyssa sylvatica	5	No	FAC	
3				I otal Number of Dominant Species Across All Strata: 3 (B)
۵ ۸				
4				Percent of Dominant Species
ə				That Are OBL, FACW, or FAC: (A/B)
6			······	Prevalence Index worksheet
7				Total % Cover of: Multiply by:
8				
	65	= Total Cove	er	OBL species X 1 =
Sapling/Shrub Stratum (Plot size: 30 feet )				FACW species x 2 =
<sub>1.</sub> Liquidambar styraciflua	10	Yes	FAC	FAC species x 3 =
2. Ilex opaca	2	No	FACU	FACU species x 4 =
3. Vaccinium sp.	2	No	N/A	UPL species x 5 =
а. Л				Column Totals: (A) (B)
4				
5				Prevalence Index = B/A =
6			·	Hydrophytic Vegetation Indicators:
7				1 Denid Test for Lludrenbytic Vegetation
8		. <u> </u>		
9.				2 - Dominance Test is >50%
10				3 - Prevalence Index is ≤3.0 <sup>1</sup>
10	14	Total Caur		4 - Morphological Adaptations <sup>1</sup> (Provide supporting
Herb Stratum (Plot size: 15 feet )		= Total Cove	er	data in Remarks or on a separate sheet)
<ol> <li>Smilax rotundifolia</li> </ol>	10	No	FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
Carey sp	60	Ves		
2. Carex sp.		<u> </u>		1 to the stars of the data as the set of the set bendes to me second
3. Ilex opaca	2	NO	FACU	Indicators of hydric soil and wetland hydrology must
4				De finitiere of Four Manatation Official
5				Definitions of Four vegetation Strata:
6.				Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
7				more in diameter at breast height (DBH), regardless of
0				height.
o				Sanling/Shrub – Woody plants, excluding vines, less
9				than 3 in. DBH and greater than or equal to 3.28 ft (1
10		·		m) tall.
11				
12				of size, and woody plants less than 3.28 ft tall
	72	= Total Cove	er	
Woody Vine Stratum (Plot size: 30 feet )				Woody vine – All woody vines greater than 3.28 ft in
1				height.
2.				
3				
3				
4				Hydrophytic
5				Vegetation
6				Present? Yes X No
	0	= Total Cove	er	
Remarks: (Include photo numbers here or on a separate	sheet )			
Remarks. (include photo numbers here of on a separate	sneet.)			

Profile Descri								Sampling Point:		
	iption: (Describe	e to the de	pth needed to docu	ment the	indicator	or confirn	n the absen	ce of indicators.)		
Depth	Depth <u>Matrix</u>		Redox Features			. 2	_			
(inches)	Color (moist)	%	Color (moist)	%	Type'		Texture	Remarks		
0-4	10YR 4/2	90	10YR 4/6	10	C	IVI	clay			
4-12+	2.5Y 5/2	70	10YR 5/6	30	С	Μ	clay			
······································							·			
<u> </u>							·			
<u> </u>										
							·			
1 <u>т о о</u>							2			
Type: C=Cor	ncentration, D=De	pletion, RIV	I=Reduced Matrix, IV	IS=Masked	d Sand Gr	ains.	Location:	PL=Pore Lining, M=Matrix.		
			Dark Surfac	0 (97)			inc	2 cm Muck (A10) (MI DA 147)		
Histic Enir	nedon (A2)		Polyvalue B	e (S7) elow Surfa	ce (S8) (N	/II R  147	148)	Coast Prairie Redox (A16)		
Black Hist	tic (A3)		Thin Dark S	urface (S9	) (MLRA <sup>·</sup>	147. 148)		(MLRA 147, 148)		
Hydrogen	Sulfide (A4)		Loamy Gley	ed Matrix (	(F2)	,,	Piedmont Floodplain Soils (F19)			
Stratified	Layers (A5)		× Depleted Ma	atrix (F3)			(MLRA 136, 147)			
2 cm Muc	ck (A10) (LRR N)		Redox Dark	Surface (F	-6)		Very Shallow Dark Surface (TF12)			
Depleted	Below Dark Surface	ce (A11)	Depleted Date	ark Surface	e (F7)		Other (Explain in Remarks)			
Thick Dar	rk Surface (A12)		Redox Depr	essions (F	8)					
Sandy Mu	ucky Mineral (S1)	(LRR N,	Iron-Mangar	nese Mass	es (F12) <b>(</b>	LRR N,				
MLRA	147, 148)		MLRA 1	36) 200 (F12) (		06 400)	3	Indiantara of hydrophytic vegetation and		
Sandy Gie	eyed Matrix (54)		Umbric Surr	ace (F13) oodolain S		MIDA 1/	19)	wetland bydrology must be present		
Stripped M	Matrix (S6)		Red Parent	Material (F	21) (MI R	A 127. 14	+0) 7)	unless disturbed or problematic		
Restrictive La	aver (if observed)	):		material (i	21)(1121)		.,			
Type:		, ,								
Depth (inch	hes):						Hvdric S	oil Present? Yes × No		
Remarks	/									
riturito.										

Attachment 11 Page 104 of 185

#### WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site. Winding Creek		City/C	County. Stafford Coun	ity	Sampling Date: March 21, 2014				
Applicant/Owner: Winding Creek Owner, LLC State: Virginia Sampling Point: DP-B2									
Investigator(s): S. Gagnon & J. Muller Section Township Pages									
Landform (billolona, torrage, etc.	Hillslope		lief (concerve), converver	Convex	Slope (%): 5%				
	RP .	Local lei		784019 9837					
Subregion (LRR or MLRA):	La	t: <u>0040710.1707</u>	Long:	104013.3001	Datum: NAD83				
Soil Map Unit Name: TeB, Te	otum line sandy loa	am, 2 to 6 percent si	lopes	NWI classific	cation: N/A				
Are climatic / hydrologic condition	ons on the site typical	for this time of year? Y	res X No	(If no, explain in R	lemarks.)				
Are Vegetation, Soil	, or Hydrology	significantly distur	rbed? Are "Norma	al Circumstances" r	present? Yes X No				
Are Vegetation, Soil	, or Hydrology	naturally problem	atic? (If needed,	explain any answe	ers in Remarks.)				
SUMMARY OF FINDING	S – Attach site r	map showing san	npling point locati	ons, transects	, important features, etc.				
Hydrophytic Vegetation Prese	nt? Yes	NoX	Is the Sampled Area						
Hydric Soil Present?	Yes	No X	within a Wetland?	Yes	No ×				
Wetland Hydrology Present?	Yes	No X							
Remarks:									
HYDROLOGY									
Wetland Hydrology Indicato	rs:			Secondary Indica	ators (minimum of two required)				
Primary Indicators (minimum of	of one is required; che	ck all that apply)		<ul> <li> Surface Soil Cracks (B6)</li> <li> Sparsely Vegetated Concave Surface (B8)</li> <li> Drainage Patterns (B10)</li> </ul>					
Surface Water (A1)	_	True Aquatic Plants (	(B14)						
High Water Table (A2)	—	Hydrogen Sulfide Od	lor (C1)						
Saturation (A3)	—	Oxidized Rhizospher	res on Living Roots (C3)	Moss Trim L	ines (B16)				
Water Marks (B1)		Presence of Reduced	d Iron (C4)	Dry-Season	Water Table (C2)				
Sediment Deposits (B2)		_ Recent Iron Reductio		Crayfish Bur	rows (C8)				
Algel Mat or Crust (B4)		Other (Explain in Reg	unarke)	Saturation V	Stressed Plants (D1)				
Algan Mat of Crust (D4)	—		indiks)	Geomorphic	Position (D2)				
Inundation Visible on Aeri	al Imagery (B7)			Shallow Agu	litard (D3)				
Water-Stained Leaves (B	9)			Microtopogra	aphic Relief (D4)				
Aquatic Fauna (B13)	,			FAC-Neutral	Test (D5)				
Field Observations:									
Surface Water Present?	Yes No X	Depth (inches):							
Water Table Present?	Yes No X	Depth (inches):							
Saturation Present?	Yes No X	Depth (inches):	Wetland	Hydrology Preser	nt? Yes No _ ×				
(includes capillary fringe)	am gauge monitoring	well aerial photos pre	vious inspections) if av	ailable:					
Describe Recorded Data (sile	an gauge, monitoring	weil, aeriai priotos, pre		allable.					
Remarks:									

Attachment 11 Page 105 of 185

# **VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: DP-B2

224	Absolute	Dominant I	ndicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 feet )	<u>% Cover</u>	Species?	Status	Number of Dominant Species
1. Pinus virginiana	40	Yes	UPL	That Are OBL, FACW, or FAC: (A)
2. Liriodendron tulipitera	50	Yes	FACU	Total Number of Dominant
<sub>3.</sub> Quercus alba	20	No	FACU	Species Across All Strata: <u>6</u> (B)
4. Quercus rubra	5	No	FACU	Demonst of Dominant Creation
5				That Are OBL, FACW, or FAC: 17% (A/B)
6				
7				Prevalence Index worksheet:
8.				Total % Cover of: Multiply by:
	115	= Total Cove	r	OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 30 feet )				FACW species x 2 =
1. Quercus prinus	2	No	UPL	FAC species x 3 =
<sub>2.</sub> Nyssa sylcatica	5	Yes	FAC	FACU species x 4 =
<sub>3.</sub> Fagus grandifolia	10	No	FACU	UPL species x 5 =
4. Vaccinium sp.	1	No	N/A	Column Totals: (A) (B)
5. Liquidambar styraciflua	2	No	FAC	
6 Ilex opaca	5	Yes	FACU	Prevalence Index = B/A =
7				Hydrophytic Vegetation Indicators:
0				1 - Rapid Test for Hydrophytic Vegetation
8				2 - Dominance Test is >50%
9				3 - Prevalence Index is $≤3.0^1$
10	25			4 - Morphological Adaptations <sup>1</sup> (Provide supporting
Herb Stratum (Plot size: 15 feet	25	= Total Cove	r	data in Remarks or on a separate sheet)
1 Dendrolycopodium obscurum	30	Yes	FACU	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
lex opaca	5	No	FAC	
2. 100 0000	. <u> </u>			<sup>1</sup> Indicators of hydric soil and wetland hydrology must
3				be present, unless disturbed or problematic.
4	·			Definitions of Four Vegetation Strata:
5	·		<u> </u>	
6				<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or
7	·			height.
8	·			
9				than 3 in DBH and greater than or equal to 3.28 ft (1
10				m) tall.
11				
12				of size, and woody plants less than 3.28 ft tall.
<b>22</b> ( )	35	= Total Cove	r	
Woody Vine Stratum (Plot size: 30 feet )				Woody vine – All woody vines greater than 3.28 ft in
1	- <u></u>			
2				
3				
4				
5				Hydrophytic Vegetation
6				Present? Yes No X
	0	= Total Cove	r	
Remarks: (Include photo numbers here or on a separate	sheet )			
Remarks. (include photo numbers here of on a separate a	sneet.)			

Profile Desc	ription: (Describ	be to the de	pth needed to docu	ment the	indicator	or confirn	n the absence	of indicators.)		
Depth	Matrix F			ox Feature	<u>es</u>	2				
(inches)	Color (moist)	%	Color (moist)	%	Type'	Loc <sup>2</sup>	Texture	Remarks		
0-1	10YR 4/3	100			<u></u>		clay loam			
1-3	10YR 5/4	98	10YR 6/6	2	С	Μ	clay	faint mottles		
3-8	2.5Y 6/4	100			_		clay			
8-12+	2.5Y 6/3	95	2.5Y 6/6	5	С	Μ	sandy clay			
					·					
				·	·					
				· . <u></u>						
				·						
<sup>1</sup> Type: C=Co	oncentration, D=D	epletion, RM	I=Reduced Matrix, M	S=Maske	d Sand Gra	ains.	<sup>2</sup> Location: PL	L=Pore Lining, M=Matrix.		
Hydric Soil	ndicators:						Indica	ators for Problematic Hydric Soils <sup>3</sup> :		
Histosol	(A1)		Dark Surfac	e (S7)			2	: cm Muck (A10) <b>(MLRA 147)</b>		
Histic Ep	oipedon (A2)		Polyvalue B	elow Surfa	ace (S8) <b>(N</b>	ILRA 147,	148) <u> </u>	Coast Prairie Redox (A16)		
Black Hi	stic (A3)		Thin Dark S	urface (S9	) <b>(MLRA</b> 1	47, 148)		(MLRA 147, 148)		
Hydroge	n Sulfide (A4)		Loamy Gley	ed Matrix	(F2)		P	Piedmont Floodplain Soils (F19)		
Stratified	Layers (A5)		Depleted Ma	atrix (F3)			(MLRA 136, 147)			
2 cm Mu	ck (A10) <b>(LRR N)</b>		Redox Dark	Surface (	F6)		Very Shallow Dark Surface (TF12)			
Depleted	Below Dark Surf	ace (A11)	Depleted Date	ark Surface	e (F7)		C	Other (Explain in Remarks)		
Thick Da	ark Surface (A12)		Redox Depr	essions (F	-8)					
Sandy M	lucky Mineral (S1)	) <b>(LRR N</b> ,	Iron-Mangar	nese Mass	ses (F12) <b>(</b>	LRR N,				
MLRA	<b>147, 148)</b>		MLRA 13	36)			2			
Sandy G	leyed Matrix (S4)		Umbric Surf	ace (F13)	(MLRA 13	6, 122)	°Ind	licators of hydrophytic vegetation and		
Sandy R	edox (S5)		Piedmont FI	oodplain S	Soils (F19)	(MLRA 14	<b>18)</b> we	stland hydrology must be present,		
Stripped	Matrix (S6)	d).	Red Parent	Material (I	-21) (MLR	A 127, 14	/) un	less disturbed or problematic.		
Tuno	ayer (il observe	u).								
Type:	- L )									
Depth (Ind	cnes):						Hydric Soli	Present? Yes No		
Remarks:										

Attachment 11 Page 107 of 185

#### WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

	ORM – Eastern mountains and Fledmont Region
Project/Site: Winding Creek	_ City/County: Stafford County Sampling Date: March 21, 2014
Applicant/Owner: Winding Creek Owner, LLC	State: Virginia Sampling Point: DP-B3
Investigator(s): S. Gagnon & J. Muller	Section, Township, Range:
Landform (hillslope, terrace, etc.): Hillslope	Local relief (concave, convex, none): None Slope (%): 2%
Subregion (LRR or MLRA); LRR P Lat: 6848936.9	246 Long: 11784014.4759 Datum: NAD83
Soil Map Unit Name. TeB, Tetotum fine sandy loam, 2 to 6 per	rcent slopes
Are elimetia / hydrologia conditions on the site typical for this time of	
Are climatic / hydrologic conditions on the site typical for this time of	
Are Vegetation, Soil, or Hydrology significant	Ily disturbed? Are "Normal Circumstances" present? Yes <u>^</u> No
Are Vegetation, Soil, or Hydrology naturally p	problematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showin	ng sampling point locations, transects, important features, etc.
Hydrophytic Vagetation Present? Vag No X	
Hydric Soil Present? Yes No X	- Is the Sampled Area
Wetland Hydrology Present? Yes No X	– within a Wetland? Yes <u>No X</u>
Remarks:	
Data Point DP-B3 was collected within an unl	land area between Wetland B and Wetland C near
Elage B13/B1/ and C1/C2	
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required: check all that apply	() Surface Soil Cracks (B6)
Surface Water (A1)	Plants (B14) Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)	Ifide Odor (C1) Drainage Patterns (B10)
Saturation (A3) Oxidized Rhiz	zospheres on Living Roots (C3) Moss Trim Lines (B16)
Water Marks (B1) Presence of F	Reduced Iron (C4) Drv-Season Water Table (C2)
Sediment Deposits (B2) Recent Iron F	Reduction in Tilled Soils (C6) Crayfish Burrows (C8)
Drift Deposits (B3)	urface (C7) Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Other (Explai	in in Remarks) Stunted or Stressed Plants (D1)
Iron Deposits (B5)	Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)
Water-Stained Leaves (B9)	Microtopographic Relief (D4)
Aquatic Fauna (B13)	FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes No X Depth (inche	≥s):
Water Table Present? Yes No X Depth (inche	≥s):
Saturation Present? Yes <u>No X</u> Depth (inche (includes capillary fringe)	es): Wetland Hydrology Present? Yes NoX
Describe Recorded Data (stream gauge, monitoring well, aerial pho	otos, previous inspections), if available:
Remarks:	

Attachment 11 Page 108 of 185

# **VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point:\_\_\_\_\_

		• •	P 4		
Tree Stratum (Plot size: 30 feet	Absolute % Cover	Dominant I Species?	Status	Dominance Test worksheet:	
Acer rubrum	50	Yes	FAC	Number of Dominant Species	2 (1)
- Fagus grandifolia	10	No	FACU	That Ale OBL, FACW, of FAC.	(A)
2. Tagao grananona		No		Total Number of Dominant	<b>F</b>
<u>A Ouercus alba</u>	40	Yes	FACU	Species Across All Strata:	<u> </u>
4. duercus alba	20	<u>No</u>	FACU	Percent of Dominant Species	400/
	20	110	TAGO	That Are OBL, FACW, or FAC:	40% (A/B)
6		·		Prevalence Index worksheet:	
7		·		Total % Cover of:	Multiply by:
8		·		OBL species	1 –
Carling/Chryth Ctrature (Dist sing) 30 feet	125	= Total Cove	er		2 -
<u>Sapling/Shrub Stratum</u> (Plot size: <u>concer</u> )	10	Yes	FAC		2 =
1. Nyssa sylvalica	5	Voc	FACU	FAC species X	3 =
2. Fagus granunolla		Vee	FACU	FACU species X	4 =
3. Linodendron tulipliera	10	res	FACU	UPL species x	5 =
4		·		Column Totals: (A	(B)
5		<u> </u>		Prevalence Index $= B/A =$	
6				Hydrophytic Vegetation India	
7				A Denid Test for Undership	tio Venetetion
8				1 - Rapid Test for Hydrophy	tic vegetation
9				2 - Dominance Test is >50%	0
10.				3 - Prevalence Index is ≤3.0	1'
	25	= Total Cove	er	4 - Morphological Adaptation	ns' (Provide supporting
Herb Stratum (Plot size: 15 feet )				data in Remarks or on a	separate sheet)
1. Smilax rotundifolia	2	No	FAC	Problematic Hydrophytic Ve	getation <sup>1</sup> (Explain)
2					
3				<sup>1</sup> Indicators of hydric soil and wet	land hydrology must
4.				be present, unless disturbed or p	problematic.
5.	_			Definitions of Four Vegetation	Strata:
÷		·		Tree – Woody plants, excluding	vines 3 in (7.6 cm) or
7		·		more in diameter at breast heigh	t (DBH), regardless of
0		·		height.	
0		·		Sapling/Shrub – Woody plants.	excludina vines. less
9		· · · · · · · · · · · · · · · · · · ·		than 3 in. DBH and greater than	or equal to 3.28 ft (1
10		·		m) tall.	
11		·		Herb – All herbaceous (non-woo	ody) plants, regardless
12		- <u> </u>		of size, and woody plants less th	an 3.28 ft tall.
Woody Vine Stratum (Plat size: 30 feet	2	= Total Cove	er	Woody vine - All woody vines o	reater than 3.28 ft in
				height.	
1		·			
2		<u> </u>			
3		·			
4		·		Hydrophytic	
5				Vegetation	
6		<u> </u>		Present? Yes	No <u>×</u>
	0	= Total Cove	er		
Remarks: (Include photo numbers here or on a separate	sheet.)				
	onoon)				

SOIL								Sa	ampling Poir	DF-D3
Profile Des	scription: (Describe	e to the de	oth needed to docu	ment the	indicator	or confirm	n the absence of	f indicato	rs.)	
Depth	Matrix		Redox Features		_					
(inches)		%		<u>%</u>	Iype`		lexture		Remarks	6
0-2	10YR 5/4	95	10YR 4/6	5	<u> </u>	IVI	clay			
2-14	2.5Y 5/4	85	10YR 5/8	15	С	Μ	sandy clay			
						·				
						·				
				<u> </u>						
						·				
<sup>1</sup> Type: C=	Concentration. D=De	pletion. RM	=Reduced Matrix. M	IS=Maske	d Sand Gr	ains.	<sup>2</sup> Location: PL=F	Pore Linin	a. M=Matrix	
Hydric Soi	il Indicators:	<u> </u>	· · · · · · · · · · · · · · · · · · ·				Indicato	ors for Pro	oblematic I	Hydric Soils <sup>3</sup> :
Histos	ol (A1)		Dark Surfac	e (S7)			2 cr	m Muck (A	(10) <b>(MLRA</b>	147)
Histic I	Epipedon (A2)		Polyvalue B	elow Surfa	ace (S8) <b>(N</b>	ILRA 147	, <b>148)</b> Coa	ast Prairie	Redox (A16	6)
Black I	Histic (A3)		Thin Dark S	surface (SS	9) <b>(MLRA</b> 1	47, 148)	(1	MLRA 147	7, 148)	
Hydrog	gen Sulfide (A4)		Loamy Gley	ved Matrix	(F2)		Piec	dmont Flo	odplain Soil	s (F19)
Stratifi	ed Layers (A5)		Depleted IVI	atrix (F3)	E6)		(I Vor	MLRA 130	0, 147) Dark Surfa	00 (TE12)
2 cm k	ed Below Dark Surfa	ce (A11)	Depleted Dark	ark Surface	e (F7)		Ver	er (Explai	n in Remark	(1112)
Thick I	Dark Surface (A12)		Redox Dep	ressions (F	-8)			o. ( <u>=</u> ,p.a.		,
Sandy	Mucky Mineral (S1)	(LRR N,	Iron-Manga	nese Mass	ses (F12) <b>(</b>	LRR N,				
MLF	RA 147, 148)		MLRA 1	36)						
Sandy	Gleyed Matrix (S4)		Umbric Sur	face (F13)	(MLRA 13	6, 122)	<sup>3</sup> Indica	ators of hy	drophytic ve	egetation and
Sandy	Redox (S5)		Piedmont F	loodplain S	Soils (F19)	(MLRA 14	48) wetla	and hydrol	ogy must be	e present,
Strippe	ed Matrix (S6)	\ <b>.</b>	Red Parent	Material (I	-21) (MLR	A 127, 14	<ol> <li>unles</li> </ol>	s disturbe	ed or proble	matic.
Turner	e Layer (il Observeu	)-								
Type.	inchoo);						Hydria Sail D	recent?	Vac	No. X
	inches).						Hydric Soli P	resent?	res	
Remarks:										

Attachment 11 Page 110 of 185

#### WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site. Winding Creek	City/County: Stafford County Sampling Date: March 21, 2014
Applicant/Owner: Winding Creek Owner, LLC	State: Virginia Sampling Point: DP-C1
Investigator(s): S. Gagnon & J. Muller	Section. Township. Range:
Landform (hillslope, terrace, etc.): Drainage Feature Subregion (LRR or MLRA): LRR P Lat: 684910	Local relief (concave, convex, none): Concave Slope (%): 5% )5.9879 Long: 11784021.6641 Datum: NAD83
Soil Map Unit Name: TeB, Tetotum fine sandy loam, 2 to 6	percent slopes NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time	e of year? Yes X No (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology signifi	icantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation X, Soil , or Hydrology natura	ally problematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map sho	wing sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present?       Yes       X       No         Hydric Soil Present?       Yes       X       No         Wetland Hydrology Present?       Yes       X       No         Remarks:       Data Point DP-C1 was collected within We	Is the Sampled Area         within a Wetland?       Yes X         Yes       No         Within a Wetland?       Yes         Within a Wetland?       Yes         Within a Wetland?       Yes         Yes       X         Within a Wetland?       Yes         Yes       X         Yes       Yes         Yes
HYDROLOGY Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that a	apply) Surface Soil Cracks (B6)
×       Surface Water (A1)       True Aqu         High Water Table (A2)       Hydroget	Jatic Plants (B14)       Sparsely Vegetated Concave Surface (B8)         n Sulfide Odor (C1)       Drainage Patterns (B10)
Saturation (A3) Oxidized	Rhizospheres on Living Roots (C3) Moss Trim Lines (B16)
Sediment Deposits (B2) Recent In	ron Reduction in Tilled Soils (C6) Crayfish Burrows (C8)
Drift Deposits (B3) Thin Muc	ck Surface (C7) Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Other (E:	xplain in Remarks) Stunted or Stressed Plants (D1)
Iron Deposits (B5)	Geomorphic Position (D2)
X Water-Stained Leaves (B9)	Snallow Aquitard (D3) Microtopographic Relief (D4)
Aquatic Fauna (B13)	FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes X No Depth (i	nches): 2 inches
Water Table Present? Yes No X Depth (i	nches):
Saturation Present? Yes No X Depth (i (includes capillary fringe)	nches): Wetland Hydrology Present? Yes X No
Describe Recorded Data (stream gauge, monitoring well, aeria	I photos, previous inspections), if available:
Remarks:	

Attachment 11 Page 111 of 185

### **VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point:\_\_\_\_\_

• •	Absolute	Dominant Indicator	Dominance Test worksheet
Tree Stratum (Plot size: 30 feet )	% Cover	Species? Status	Number of Dominant Species
1.			That Are OBL, FACW, or FAC: (A)
2.			
3		·	Total Number of Dominant
4		· ·	
5		· ·	Percent of Dominant Species
3		· ·	- That Are OBL, FACW, or FAC: (A/B)
0		· ·	Prevalence Index worksheet:
<i>1</i>		· · · · · · · · · · · · · · · · · · ·	Total % Cover of: Multiply by:
8	0		- OBL species x 1 =
Sapling/Shrub Stratum (Plot size, 30 feet	0	= Total Cover	FACW species x 2 =
1			FAC species x 3 =
1		·	
2		· ·	
3		· · · · · · · · · · · · · · · · · · ·	OFL species X 3 =
4		· ·	_ Column Totals: (A) (B)
5		· ·	Prevalence Index = B/A =
6		· ·	Hydrophytic Vegetation Indicators:
7		· ·	1 - Rapid Test for Hydrophytic Vegetation
8		· · · · · · · · · · · · · · · · · · ·	2 - Dominance Test is >50%
9		· ·	- 3 - Prevalence Index is <3 0 <sup>1</sup>
10		· ·	4 - Morphological Adaptations <sup>1</sup> (Provide supporting
15 feet	0	= Total Cover	data in Remarks or on a separate sheet)
Herb Stratum (Plot size: 13 leet )			X Droblematic Lludrophytic Vegetation <sup>1</sup> (Evaluation)
1			
2		·	
3		· ·	- Indicators of hydric soil and wetland hydrology must
4		· ·	Definitions of Four Vegetation Strata:
5		· ·	-
6		· ·	<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or
7		· ·	<ul> <li>more in diameter at breast height (DBH), regardless of</li> <li>height</li> </ul>
8			_
9			Sapling/Shrub – Woody plants, excluding vines, less
10			m) tall.
11			
12.			Herb – All herbaceous (non-woody) plants, regardless
	0	= Total Cover	
Woody Vine Stratum (Plot size: <u>30 feet</u> )			Woody vine – All woody vines greater than 3.28 ft in
1			height.
2		· ·	_
3	<u> </u>		_
4			
5.			Hydrophytic
6.			Vegetation Present? Yes X No
	0	= Total Cover	
Remarks: (Include photo numbers here or on a separate	sneet.)		
Wetland C is confined to a relatively na	rrow, ur	vegetated co	ncave topographic feature.

#### Attachment 11 Page 112 of 185 DP-C1

OIL								Sampling Point:
Profile Des	scription: (Describe	e to the de	pth needed to docu	ment the i	ndicator	or confirm	n the absence	e of indicators.)
Depth	Matrix		Redo	x Features	<u>S</u> 1	. 2		
nches)	Color (moist)	%	Color (moist)	%	Type'	Loc	Texture	Remarks
-5	10YR 6/2	90	7.5YR 4/6	10	С	Μ	sandy clay	
-12	2.5Y 6/2	100					sandy clay	
						·		
	<u> </u>							
						·	·	
vpe: C=C	Concentration. D=De	pletion. RN	/-Reduced Matrix. M	S=Masked	Sand Gr	ains.	<sup>2</sup> Location: Pl	
dric Soil	Indicators:						Indic	ators for Problematic Hydric Soils <sup>3</sup> :
, Histoso	ol (A1)		Dark Surface	e (S7)			2	2 cm Muck (A10) <b>(MLRA 147)</b>
Histic Epipedon (A2) Polyvalue Below Surface (S8) (MLRA 147, 14							, <b>148)</b>	Coast Prairie Redox (A16)
Black Histic (A3) Thin Dark Surface (S9) (MLRA 147, 148)								(MLRA 147, 148)
Hydrogen Sulfide (A4) Loamy Gleved Matrix (F2)							P	Piedmont Floodplain Soils (F19)
Stratified Lavers (A5)								(MLRA 136, 147)
2 cm Muck (A10) (I BR N) Bedox Dark Surface (F6)							V	(erv Shallow Dark Surface (TE12)
Depleted Below Dark Surface (A11) Depleted Dark Surface (F7)						`	ther (Explain in Remarks)	
Thick Dark Surface (A12) Redox Depressions (F8)								
_ Thick D	Mucky Minoral (S1)				) 20 (E12) <b>(</b>			
		LKK N,			35 (F12) (	LKK N,		
WILK	(A 147, 148)		WILRA 13	<b>(0</b> )			31	Produce of the device of the second of the second
Sandy Gleyed Matrix (S4) Umbric Surface (F13) (MLRA 13					56, 122)	Ind	licators of hydrophytic vegetation and	
Sandy Redox (S5)			Piedmont Floodplain Soils (F19) (MLRA 148				<b>8)</b> wetland hydrology must be present,	
_ Strippe	d Matrix (S6)		Red Parent I	Material (F	21) <b>(MLR</b>	A 127, 14	<b>7)</b> un	less disturbed or problematic.
estrictive	Layer (if observed	):						
Туре:								
Depth (ir	nches):						Hydric Soil	Present? Yes <u>×</u> No
emarks:								
Attachment 11 Page 113 of 185

#### WETI AND DETERMINATION DATA FORM Eastern M untains and Piedmont Region

	City/County: Stafford County Sampling Date: March 21, 2014
Applicant/Owner: Winding Creek Ow	ner, LLC State: Virginia Sampling Point: DP-D1
Investigator(s): S. Gagnon & J. Mulle	r Section. Township. Range:
Landform (hillslope, terrace, etc.). Depi	ession Local relief (concave, convex, none). Concave Slope (%). 5%
Subragion (I BB or MI BA): LRR P	Let: 6849886.8237 Long: 11783547.1285 Detum: NAD83
Subregion (LRR of MLRA):	Lat: Lat: Datum: Long: Long: Datum: Datum:
Soil Map Unit Name: 0002, 00101110	NWI classification: N/A
Are climatic / hydrologic conditions on th	e site typical for this time of year? Yes <u>No</u> (If no, explain in Remarks.)
Are Vegetation, Soil, or H	Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation, Soil, or H	Hydrology naturally problematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS - At	tach site map showing sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present?	Yes <u>NO</u> Is the Sampled Area
Wetland Hydrology Present?	Yes X No within a Wetland? Yes X No
Remarks:	
Data Point DR D1 was cal	lacted within Watland D poor Elage D2/D4
Data FUIII DF-DT was coi	lected within wetland D hear Flags D3/D4.
HIDROLOGI	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is	required; check all that apply) Surface Soil Cracks (B6)
Surface Water (A1)	Irue Aquatic Plants (B14) Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)	Hydrogen Sullide Odor (C1) Drainage Patterns (B10)
Saturation (AS)	<u> Presence of Reduced Iron (C4)</u> <u> Dry-Season Water Table (C2)</u>
Sediment Deposits (B2)	Recent Iron Reduction in Tilled Soils (C6) Cravitish Burrows (C8)
Drift Deposits (B3)	Thin Muck Surface (C7) Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Other (Explain in Remarks) Stunted or Stressed Plants (D1)
Iron Deposits (B5)	Geomorphic Position (D2)
Inundation Visible on Aerial Image	ry (B7) Shallow Aquitard (D3)
× Water-Stained Leaves (B9)	Microtopographic Relief (D4)
Aquatic Fauna (B13)	FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes	✓ No Depth (inches): < 1 inch
Water Table Present? Yes	No <u>×</u> Depth (inches):
Saturation Present? Yes	No X Depth (inches): Wetland Hydrology Present? Yes X No
(includes capillary fringe)	
Describe Recorded Data (stream gaug	e, monitoring weil, aerial photos, previous inspections), ir available:
1	
Remarks:	

Attachment 11 Page 114 of 185

## **VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: DP-D1

	Absolute	Dominant I	ndicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 feet )	% Cover	Species?	Status	Number of Dominant Species
<sub>1.</sub> Ulmus rubra	20	Yes	FAC	That Are OBL, FACW, or FAC: $^{6}$ (A)
2 Acer rubrum	70	Yes	FAC	
2		·		Total Number of Dominant
3		·		Species Across All Strata: (B)
4		·		Percent of Dominant Species
5				That Are OBL, FACW, or FAC: <u>86%</u> (A/B)
6				
7.				Prevalence Index worksheet:
8				Total % Cover of:Multiply by:
0	90	- Total Cave		OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 30 feet )			;1	FACW species x 2 =
1 Liquidambar styraciflua	10	Yes	FAC	FAC species x 3 =
Acer rubrum	20	Ves	FAC	
		103	<u> </u>	FACU species         X 4 =
3. Nyssa sylvatica	10	Yes	FAC	UPL species x 5 =
4				Column Totals: (A) (B)
5.				
6				Prevalence Index = B/A =
		·		Hydrophytic Vegetation Indicators:
1		·		1 - Rapid Test for Hydrophytic Vegetation
8				X 2 - Dominance Test is >50%
9				$\frac{1}{2} = 2  \text{Derividence index is } <0.07$
10				3 - Prevalence index is ≤3.0
	40	= Total Cove	er	4 - Morphological Adaptations' (Provide supporting
Herb Stratum (Plot size: 15 feet )				data in Remarks or on a separate sheet)
1. Ilex opaca	5	Yes	FACU	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
2 Liquidambar styraciflua	5	Yes	FAC	
<ul> <li>Smilay rotundifolia</li> </ul>	2	No	FAC	<sup>1</sup> Indicators of hydric soil and wotland hydrology must
3. 3111102 1010110110110		NO	TAC	be present, unless disturbed or problematic.
4				Definitions of Four Vegetation Strates
5				Deminions of Four vegetation Strata.
6.				Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
7				more in diameter at breast height (DBH), regardless of
°				height.
8				Sanling/Shrub – Woody plants, excluding vines, less
9		·		than 3 in. DBH and greater than or equal to 3.28 ft (1
10		·		m) tall.
11				
12.				<b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall
	12	= Total Cove	er	
Woody Vine Stratum (Plot size: <u>30 feet</u> )				Woody vine – All woody vines greater than 3.28 ft in
1.				height.
2				
2		·		
3		·		
4		·		Lu droph tio
5				Vegetation
6				Present? Yes X No
	0	= Total Cove	er	
Remarks: (Include photo numbers here or on a separate	sheet.)			

#### Attachment 11 Page 115 of 185 DP-D1

SOIL								Sampling	Point: DP-D	1
Profile Desc	cription: (Describe	to the de	pth needed to docu	ment the i	indicator	or confirn	n the absence	e of indicators.)		
Depth	Matrix		Rede	ox Feature	S					
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Rem	narks	
0-3	2.5Y 5/3	92	2.5Y 5/6	8	С	Μ	clay			
3-7	5Y 5/2	70	7.5YR 4/6	30	С	Μ	clay			
7-12+	2.5Y 5/3	70	10YR 4/6	30	С	Μ	clay			
		_								
		_					·			
			- <u>-</u>			·				
						·				
						·	·			
Type: C=C	oncentration, D=Dep	letion, RM	/I=Reduced Matrix, M	S=Masked	d Sand Gr	ains.	<sup>2</sup> Location: P	L=Pore Lining, M=M	atrix.	- <sup>3</sup> .
			Dork Surfag	o (67)			indic			5:
Histic Fi	(AT) pipedon (A2)		Polyvalue B	e (S7) elow Surfa	ice (S8) <b>(N</b>	ILRA 147.	. 148) (	Coast Prairie Redox	(A16)	
Black H	istic (A3)		Thin Dark S	urface (S9	) (MLRA 1	47, 148)	, <b>.</b> , <u> </u>	(MLRA 147, 148)	(	
Hydroge	en Sulfide (A4)		Loamy Gley	ed Matrix (	(F2)		F	Piedmont Floodplain	Soils (F19)	
Stratifie	d Layers (A5)		× Depleted Ma	atrix (F3)				(MLRA 136, 147)		
2 cm Mu	uck (A10) <b>(LRR N)</b> d Dalaw Dark Surfac	o (A11)	Redox Dark	Surface (F	=6)			/ery Shallow Dark S	urface (TF12)	
Deplete Thick D:	d Below Dark Surfac ark Surface (A12)	e (A11)	Depleted Da	essions (F	8)		(	Jther (Explain in Rei	narks)	
Sandy N	/ucky Mineral (S1) (	LRR N,	Iron-Mangar	nese Mass	es (F12) <b>(</b>	LRR N,				
MLR	A 147, 148)	,	MLRA 1	36)		,				
Sandy G	Gleyed Matrix (S4)		Umbric Surf	ace (F13)	(MLRA 13	6, 122)	<sup>3</sup> Inc	dicators of hydrophy	tic vegetation an	nd
Sandy F	Redox (S5)		Piedmont Fl	oodplain S	Soils (F19)	(MLRA 14	48) we	etland hydrology mu	st be present,	
Stripped	Matrix (S6)		Red Parent	Material (F	·21) (MLR	A 127, 14	7) ur	nless disturbed or pro	oblematic.	
Type	Layer (il observeu)	•								
Depth (in	ches).						Hydric Soi	l Present? Yes	X No	
Remarks:							Inyano con			
Nemarks.										

Attachment 11 Page 116 of 185

## WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Winding Cree	k				Citv/C	County: Staff	ord Count	ty	Sampling Da	ate: March 21,	2014	
Applicant/Owner: Winding (	Creek Own	ner, LLC	)					State: Virginia	Sampling	Point: DP-D2		
Investigator(c). S. Gagnon	& J. Muller	r			Socti	on Township	Pango:					
	Hillslo	ope								Class (0/): 5%		
Landform (nillslope, terrace, e	яс.): <u>т інюіс</u> DD D	<u>, , , , , , , , , , , , , , , , , , , </u>		69/09/	Local rei	lief (concave,	convex, no	ne):		Slope (%): <u>5%</u>		
Subregion (LRR or MLRA):			Lat	004904	+0.7230		Long: 117	03525.0050	D	atum: NAD83		
Soil Map Unit Name: CaC2,	Caroline f	ine san	idy Io	bam, 6 to	o 10 percer	nt slopes, ero	oded	NWI classific	ation: N/A			
Are climatic / hydrologic cond	itions on the	e site typ	ical f	or this tim	e of year? Y	res <u>X</u> N	o	(If no, explain in R	emarks.)			
Are Vegetation, Soil _	, or H	lydrology	/	signif	ficantly distur	rbed?	re "Norma	I Circumstances" p	present? Yes	s_X_No_		
Are Vegetation, Soil _	, or H	lydrology	/	natur	ally problem	atic? (	lf needed, o	explain any answe	rs in Remark	s.)		
SUMMARY OF FINDIN	IGS – Att	tach si	ite n	nap sho	owing san	npling poir	nt locatio	ons, transects	, importar	nt features,	etc.	
Hydrophytic Vegetation Pres	sent?	Yes		No	×	lo the Com						
Hydric Soil Present?		Yes _		No	×	within a We	atland?	Yes	No	<		
Wetland Hydrology Present	?	Yes _		No	×	within a we	dana .	100				
Remarks:												
HYDROLOGY												
Wetland Hydrology Indica	tors:							Secondary Indica	ators (minimu	m of two require	d)	
Primary Indicators (minimum	n of one is r	equired:	choc	k all that	annly)			Surface Soil	Cracks (B6)	n or two require	<u>,u)</u>	
Surface Water (A1)		<u>equireu,</u>	CHEC		uatic Plante (	(P14)		Surface Soli Clacks (B0)				
High Water Table (A2)				Hydroge	ualic Flanis ( In Sulfide Od	(D14)		Opaisely Ve	tterns (R10)	ave Sunace (Do	)	
Saturation (A3)				Oxidized	l Rhizospher	es on Living F	Roots (C3)	Moss Trim L	ines (B16)			
Water Marks (B1)				Presence	e of Reduced	d Iron (C4)	(00)	Dry-Season	Water Table	(C2)		
Sediment Deposits (B2)	)		_	Recent I	ron Reductio	on in Tilled So	ls (C6)	Crayfish Bur	rows (C8)			
Drift Deposits (B3)				Thin Mu	ck Surface (0	C7)		Saturation V	isible on Aeria	al Imagery (C9)		
Algal Mat or Crust (B4)				Other (E	xplain in Rer	marks)		Stunted or S	tressed Plant	s (D1)		
Iron Deposits (B5)								Geomorphic	Position (D2)	i		
Inundation Visible on A	erial Imager	y (B7)						Shallow Aqu	itard (D3)			
Water-Stained Leaves	(B9)							Microtopogra	aphic Relief (E	)4)		
Aquatic Fauna (B13)						r		FAC-Neutral	Test (D5)			
Field Observations:	N		¥									
Surrace Water Present?	Yes	NO	×	_ Depth (	incnes):							
Water Table Present?	Yes	No _	$\overline{}$	_ Depth (	inches):				( <b>0</b> ) Y			
Saturation Present? (includes capillary fringe)	Yes	No _	^	_ Depth (	inches):		Wetland I	Hydrology Preser	it? Yes	No^		
Describe Recorded Data (st	ream gauge	ə, monito	oring	well, aeria	al photos, pre	evious inspect	ions), if ava	ailable:				
Remarks:												

Attachment 11 Page 117 of 185

# **VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: DP-D2

	Absolute	Dominant	Indicator	Dominance Test worksheet:		
Tree Stratum (Plot size: 30 feet )	<u>% Cover</u>	Species?	Status	Number of Dominant Species		
<sub>1.</sub> Liriodendron tulipifera	30	Yes	FACU	That Are OBL, FACW, or FAC:	<u>3</u> (A	۹)
2. Acer rubrum	50	Yes	FAC		、	,
3. Pinus virginiana	30	Yes	UPL	Total Number of Dominant	9 (F	3)
4		·		opecies Acioss Ali otrata.		)
5		·	·······	Percent of Dominant Species	33%	
5				That Are OBL, FACW, or FAC:	(A	√B)
8		·	<u> </u>	Prevalence Index worksheet:		
<i>1</i>		·		Total % Cover of:	Multiply by:	
8	110			OBL species	x 1 =	
Sapling/Shrub Stratum (Plot size: 30 feet	110	= I otal Cove	ər	FACW species	x 2 =	
<ul> <li>Liriodendron tulipifera</li> </ul>	30	Yes	FACU	FAC species	x 3 =	
2 Nvssa svlvatica	2	No	FAC		× 4 –	
2 Acer rubrum	10	Yes	FAC		× 5 -	
		<u>No</u>	FACIL		<pre></pre>	(D)
4. <i>Itex Opaca</i>			TACO		A)(	(B)
5		·	<u> </u>	Prevalence Index = $B/A$ =	=	
6		·		Hydrophytic Vegetation Indic	ators:	
7				1 - Rapid Test for Hydroph	vtic Vegetation	
8		. <u> </u>		2 - Dominance Test is >50	%	
9				2 Provalance Index is <3	0 <sup>1</sup>	
10				5 - Flevalence Index is ±5.	u ono <sup>1</sup> (Brovido ounnos	rtina
	44	= Total Cove	ər			ung
Herb Stratum (Plot size: 15 feet )			FAOL	data in Remarks or on a	a separate sneet)	
1. <u>Ilex opaca</u>		Yes	FACU	Problematic Hydrophytic V	egetation (Explain)	
2. Polsytichum acrostichoides	3	Yes	FACU			
<sub>3.</sub> Goodyera pubescens	1	Yes	FACU	<sup>1</sup> Indicators of hydric soil and we	stland hydrology mus	st
4				De present, unless disturbed of		
5				Definitions of Four Vegetatio	n Strata:	
6				Tree - Woody plants, excluding	g vines, 3 in. (7.6 cm	) or
7				more in diameter at breast heig	ht (DBH), regardless	s of
8				neight.		
9.				Sapling/Shrub - Woody plants	s, excluding vines, le	SS
10.		·		than 3 in. DBH and greater than	ו or equal to 3.28 ft (	(1
11		·				
12		·		Herb – All herbaceous (non-wo	ody) plants, regardle	ess
	5	- Total Cove		of size, and woody plants less t	nan 3.28 ft tall.	
Woody Vine Stratum (Plot size: 30 feet )		- 10101 0011		Woody vine - All woody vines	greater than 3.28 ft i	in
1. Smilax rotundifolia	5	Yes	FAC	height.		
2.						
3.		·				
4						
5		·		Hydrophytic		
°		·		Vegetation	No. X	
0	5	– Total Cov		Present? fes		
			51			
Remarks: (Include photo numbers here or on a separate	sheet.)					

nches)	Color (moist)	%	Color (moist)	<u>% reatures</u>		Loc <sup>2</sup>	Texture Remarks	
-4	10YR 4/3	100					clay loam	
-10	2.5Y 5/3	80	10YR 5/8	20	С	Μ	clay	
0-14	10YR 4/2	80	7.5YR 5/8	20	С	M	clav	
		- <u> </u>						
ype: C=Co	oncentration, D=Dep	letion, RM	=Reduced Matrix, M	S=Masked	Sand Gr	ains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.	
Histosoi Histosoi Black Hi Hydroge Stratified 2 cm Mu Depleted Thick Da Sandy M MLRA Sandy G Sandy R Stripped	(A1) pipedon (A2) stic (A3) n Sulfide (A4) d Layers (A5) d Below Dark Surface ark Surface (A12) fucky Mineral (S1) (I A 147, 148) sileyed Matrix (S4) edox (S5) Matrix (S6) Layer (if observed)	e (A11) L <b>RR N,</b>	<ul> <li>Dark Surraci</li> <li>Polyvalue Ba</li> <li>Thin Dark Surraci</li> <li>Loamy Gley</li> <li>Depleted Ma</li> <li>Redox Dark</li> <li>Depleted Da</li> <li>Redox Deprime</li> <li>Iron-Mangar</li> <li>MLRA 13</li> <li>Umbric Surfa</li> <li>Piedmont Fla</li> <li>Red Parent</li> </ul>	e (S7) elow Surfac urface (S9) ed Matrix (F3) Surface (F rrk Surface essions (F8 nese Masse <b>36)</b> ace (F13) <b>(</b> oodplain Si Material (F	ce (S8) (N (MLRA 7 F2) 6) (F7) 3) es (F12) ( MLRA 13 oils (F19) 21) (MLR	ILRA 147, 147, 148) LRR N, 6, 122) (MLRA 14 A 127, 147	<ul> <li>2 cm MUCK (A10) (MLRA 147)</li> <li>Coast Prairie Redox (A16) (MLRA 147, 148)</li> <li>Piedmont Floodplain Soils (F19 (MLRA 136, 147)</li> <li>Very Shallow Dark Surface (TF Other (Explain in Remarks)</li> </ul>	) 12) on and ent,
Туре:								
Depth (ind	ches):						Hydric Soil Present? Yes No	• <u>×</u>

Attachment 11 Page 119 of 185

### WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Winding Creek	City/County: Sta	afford County	Sampling Date: March 21, 2014
Applicant/Owner: Winding Creek Owner, LLC		State: Virginia	Sampling Point: DP-E1
Investigator(s): S. Gagnon & J. Muller	Section, Townsh	ip, Range:	
Landform (hillslope, terrace, etc.): Drainage Feature	Local relief (concave	e, convex, none): Concave	Slope (%): 7%
Subregion (LRR or MLRA): LRR P Lat: 685016	5.1153	_ Long: 11783771.1450	Datum: NAD83
Soil Map Unit Name: Ae, Alluvial land, wet		NWI classifica	ation: N/A
Are climatic / hydrologic conditions on the site typical for this time	e of year? Yes X	No (If no, explain in Re	emarks.)
Are Vegetation, Soil, or Hydrology signifi	cantly disturbed?	Are "Normal Circumstances" pr	resent? Yes X No
Are Vegetation, Soil, or Hydrology natura	ally problematic?	(If needed, explain any answer	s in Remarks.)
SUMMARY OF FINDINGS – Attach site map sho	wing sampling po	oint locations, transects,	important features, etc.
Hydrophytic Vegetation Procent? Veg. No.	×		

Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present?	Yes Yes Yes	No X No No X	Is the Sampled Area within a Wetland?	Yes	No_	×
Remarks:						
		• •	 	( ) ( )		

Data Point DP-E1 was collected within a topographic feature just upslope of Wetland E near Flags E1/E2.

#### HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
Surface Water (A1) True Aquatic Plants (B14)	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2) Hydrogen Sulfide Odor (C1)	Drainage Patterns (B10)
Saturation (A3) Oxidized Rhizospheres on Living	Roots (C3) Moss Trim Lines (B16)
Water Marks (B1) Presence of Reduced Iron (C4)	Dry-Season Water Table (C2)
Sediment Deposits (B2) Recent Iron Reduction in Tilled So	ils (C6) Crayfish Burrows (C8)
Drift Deposits (B3) Thin Muck Surface (C7)	Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Other (Explain in Remarks)	Stunted or Stressed Plants (D1)
Iron Deposits (B5)	Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)
Water-Stained Leaves (B9)	Microtopographic Relief (D4)
Aquatic Fauna (B13)	FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes <u>No X</u> Depth (inches):	
Water Table Present? Yes No X Depth (inches):	
Saturation Present? Yes <u>No X</u> Depth (inches): (includes capillary fringe)	Wetland Hydrology Present? Yes No
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspec	tions), if available:
-	
Remarks:	

Attachment 11 Page 120 of 185

# **VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: DP-E1

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 feet )	<u>% Cover</u>	Species?	Status	Number of Dominant Spacing
1 Quercus alba	80	Yes	FACU	That Are OBL EACW/ or EAC $0$ (A)
- Fagus grandifolia	20	Ves	FACU	
2. 1 agus granaíolia	20	103	1,400	Total Number of Dominant
3				Species Across All Strata: <u>3</u> (B)
4.				
5				Percent of Dominant Species
0	·			That Are OBL, FACW, or FAC: (A/B)
6	·			Prevalence Index worksheet
7				
8				
	100	= Total Cov	<u>ə</u> r	OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 30 feet )			51	FACW species x 2 =
1 Fagus grandifolia	30	Yes	FACU	FAC species x 3 =
o Ouercus alba	5	No	FACU	
				FACU species X 4 =
3. Cornus florida	2	No	FACU	UPL species x 5 =
4.				Column Totals: (A) (B)
5				
3				Prevalence Index = B/A =
6	·			Hydrophytic Vegetation Indicators:
7	·			1. Donid Test for Lludronbutio Verstation
8				
9				2 - Dominance Test is >50%
40	·			3 - Prevalence Index is ≤3.0 <sup>1</sup>
10	27			4 - Morphological Adaptations <sup>1</sup> (Provide supporting
15 feet	37	= Total Cov	er	data in Remarks or on a separate sheet)
Herb Stratum (Plot size: 10 leet )				
1				Problematic Hydrophytic Vegetation (Explain)
2				
3				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
۰				be present, unless disturbed or problematic.
4	·			Definitions of Four Vegetation Strata:
5				
6				Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
7.				more in diameter at breast height (DBH), regardless of
8				height.
0	·			Sanling/Shrub – Woody plants, excluding vines, less
9	·			than 3 in. DBH and greater than or equal to 3.28 ft (1
10				m) tall.
11.				
12				Herb – All herbaceous (non-woody) plants, regardless
12	0			of size, and woody plants less than 3.28 ft tall.
Woody Vine Stratum (Plot size: 30 feet )	0	= Total Cov	er	<b>Woody vine</b> – All woody vines greater than 3.28 ft in
				height.
1				
2				
3.				
4				
				Hydrophytic
5				Vegetation
6				Present? Yes No X
	0	= Total Cov	er	
Describer (herbeite schelte sonschenscheren besternen beiter	( )			
Remarks: (Include photo numbers here or on a separate s	sheet.)			

## Attachment 11 Page 121 of 185

Sampling Point: DP-E1

Profile Desc	ription: (Describe	to the de	pth needed to docu	ment the	indicator	or confirm	n the abse	nce of indicators.)
Depth	Matrix		Redo	ox Feature	<u>es</u>			
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	e Remarks
0-5	10YR 4/2	95	10YR 5/6	5	С	M	clay	
5-11	10YR 4/1	90	7.5YR 5/8	10	С	Μ	clay	
11-15+	10YR 5/2	70	7.5YR 5/8	30	С	Μ	clay	
					·			
					·			
					·	·		
					<u></u>			
$\frac{1}{1}$		lation PM		S-Maaka	d Sand Cr		<sup>2</sup> Logation	
Hydric Soil	Indicators		I=Reduced Matrix, M	S=IVIASKe	u Sanu Gr	ains.	Location	dicators for Problematic Hydric Soils <sup>3</sup>
Histosol	(A1)		Dark Surfac	a (S7)				2 cm Muck (A10) <b>(MI BA 147)</b>
Histic Fr	(AT) Dipedon (A2)		Polyvalue B	elow Surfa	ace (S8) <b>(N</b>	II RA 147	148)	Coast Prairie Redox (A16)
Black Hi	stic (A3)		Thin Dark S	urface (S9	) (MLRA 1	47, 148)		(MLRA 147, 148)
Hydroge	en Sulfide (A4)		Loamy Gley	ed Matrix	(F2)			Piedmont Floodplain Soils (F19)
Stratified	d Layers (A5)		X Depleted Ma	atrix (F3)				(MLRA 136, 147)
2 cm Mu	ıck (A10) <b>(LRR N)</b>		Redox Dark	Surface (	F6)		_	Very Shallow Dark Surface (TF12)
Depleted	d Below Dark Surfac	e (A11)	Depleted Da	rk Surface	e (F7)			Other (Explain in Remarks)
Thick Da	ark Sufface (A12)		Redox Depr	essions (F	·8)			
Sanuy iv	100ky Willeral (ST) ( 147 148)	LKK N,			es (F12) (	LKK N,		
Sandy G	Gleved Matrix (S4)		Umbric Surf	ace (F13)	(MLRA 13	6. 122)		<sup>3</sup> Indicators of hydrophytic vegetation and
Sandy R	Redox (S5)		Piedmont Fl	oodplain S	Soils (F19)	(MLRA 14	18)	wetland hydrology must be present,
Stripped	Matrix (S6)		Red Parent	Material (I	=21) <b>(MLR</b>	A 127, 147	7)	unless disturbed or problematic.
Restrictive I	Layer (if observed)	:						
Type:								
Depth (ind	ches):						Hydric	Soil Present? Yes X No
Remarks:							•	

Attachment 11 Page 122 of 185

#### WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Winding Creek	City/County: Stafford County Sampling Date: March 21, 2014
Applicant/Owner: Winding Creek Owner, LLC	State: Virginia Sampling Point: DP-E2
Investigator(s): S. Gagnon & J. Muller	Section, Township, Range:
Landform (hillslope, terrace, etc.): Drainage Feature	Local relief (concave, convex, none): Concave Slope (%): 3%
Subregion (LRR or MLRA): LRR P Lat: 6	3850218.4265 Long: 11783739.3084 Datum: NAD83
Soil Map Unit Name: <u>Ae, Alluvial land, wet</u>	NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for t	this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation . Soil . or Hydrology	significantly disturbed? Are "Normal Circumstances" present? Yes × No
Are Vegetation × Soil or Hydrology	naturally problematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS	
SUMMARY OF FINDINGS – Attach site ma	p snowing sampling point locations, transects, important leatures, etc.
Hydrophytic Vegetation Present? Yes X	No Is the Sampled Area
Hydric Soil Present? Yes X	No within a Wetland? Yes X No
Wetland Hydrology Present? Yes X	No
Remarks:	
Data Point DP-E2 was collected within	n Wetland E near Flags E1/E2.
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check a	all that apply) Surface Soil Cracks (B6)
X Surface Water (A1)	rue Aquatic Plants (B14) Sparsely Vegetated Concave Surface (B8)
High Water Table (A2) Hy	ydrogen Sulfide Odor (C1) Drainage Patterns (B10)
Saturation (A3) O	xidized Rhizospheres on Living Roots (C3) Moss Trim Lines (B16)
Water Marks (B1) Pi	resence of Reduced Iron (C4) Dry-Season Water Table (C2)
Sediment Deposits (B2) R	ecent Iron Reduction in Tilled Soils (C6) Crayfish Burrows (C8)
Drift Deposits (B3) Th	hin Muck Surface (C7) Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4) O	ther (Explain in Remarks) Stunted or Stressed Plants (D1)
Iron Deposits (B5)	Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)     X Water Steined Leaves (B0)	Snallow Aquitara (D3)
Aquatic Fauna (B13)	EAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes X No F	Depth (inches): 1 inch
Water Table Present? Yes No X	Depth (inches):
Saturation Present? Yes No X F	Depth (inches): Wetland Hydrology Present? Yes X No
(includes capillary fringe)	
Describe Recorded Data (stream gauge, monitoring we	II, aerial photos, previous inspections), if available:
Pomorko:	
Remarks:	

Attachment 11 Page 123 of 185

# **VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: DP-E2

· · ·	Absolute	Dominant Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 feet )	<u>% Cover</u>	<u>Species?</u> Status	Number of Dominant Species
1			That Are OBL, FACW, or FAC: (A)
2.			
3.			I otal Number of Dominant Species Across All Strata: (B)
4.			
5			Percent of Dominant Species
6	·		
7	·		Prevalence Index worksheet:
8	·		Total % Cover of: Multiply by:
0	0		OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 30 feet )			FACW species x 2 =
1.			FAC species x 3 =
2.			FACU species x 4 =
3			UPL species x 5 =
4	·		Column Totals: (A) (B)
5	·		
5	·		Prevalence Index = B/A =
7	·		Hydrophytic Vegetation Indicators:
?	·		1 - Rapid Test for Hydrophytic Vegetation
8	·		2 - Dominance Test is >50%
9	·		3 - Prevalence Index is ≤3.0 <sup>1</sup>
10	0		4 - Morphological Adaptations <sup>1</sup> (Provide supporting
Herb Stratum (Plot size, 15 feet	0	= Iotal Cover	data in Remarks or on a separate sheet)
1			× Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
2	·		
2	·		<sup>1</sup> Indicators of hydric soil and wetland hydrology must
3	·		be present, unless disturbed or problematic.
4	·		Definitions of Four Vegetation Strata:
5	·		Tree Mandy plants evaluating vince 2 in (7.6 cm) or
6	·		more in diameter at breast height (DBH), regardless of
7	·		height.
8	·		Sanling/Shrub - Woody plants, excluding vines, less
9	·		than 3 in. DBH and greater than or equal to 3.28 ft (1
10	·		m) tall.
11	·		Herb – All herbaceous (non-woody) plants, regardless
12	·		of size, and woody plants less than 3.28 ft tall.
Weedy Vine Stratum (Plat size, 30 feet	0	= Total Cover	Woody vine All woody vines greater than 2.28 ft in
			height.
1	·		
2	·		
3			
4	·		Hydrophytic
5	·		Vegetation
6			Present? Yes X No
	0	= Total Cover	
Remarks: (Include photo numbers here or on a separate s	sheet.)		1
Wetland F is confined to a relatively na	rrow un	vegetated con	cave topographic feature
	, un		

## Attachment 11 Page 124 of 185 Sampling Point: DP-E2

SOIL								Sampling Point.
Profile Desc	ription: (Descri	be to the de	pth needed to docu	iment the	indicator	or confir	m the absence	e of indicators.)
Depth	Matrix	<	Red	ox Feature	<u>es</u>	0		
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-5	10YR 4/2	95	10YR 5/6	5	С	Μ	clay	
5-11	10YR 4/1	90	7.5YR 5/8	10	С	Μ	clay	
11-15+	10YR 5/2	70	7.5YR 5/8	30	С	Μ	clay	
						·		·
						·		
								·
						·		
<sup>1</sup> Type: C=Co	oncentration, D=D	epletion, RN	A=Reduced Matrix, N	1S=Maske	d Sand Gr	ains.	<sup>2</sup> Location: P	L=Pore Lining, M=Matrix.
Hydric Soil	Indicators:						Indic	ators for Problematic Hydric Soils <sup>3</sup> :
Histosol	(A1)		Dark Surface	e (S7)			2	2 cm Muck (A10) <b>(MLRA 147)</b>
Histic Ep	pipedon (A2)		Polyvalue B	elow Surfa	ace (S8) <b>(N</b>	/ILRA 147	7, 148) (	Coast Prairie Redox (A16)
Black Hi	stic (A3)		Thin Dark S	Surface (SS	9) <b>(MLRA</b> 1	147, 148)		(MLRA 147, 148)
Hydroge	en Sulfide (A4)		Loamy Gley	ed Matrix	(F2)		F	Piedmont Floodplain Soils (F19)
Stratified	d Layers (A5)		X Depleted M	atrix (F3)				(MLRA 136, 147)
2 cm Mu	ıck (A10) <b>(LRR N</b> )	)	Redox Dark	Surface (	F6)		\	Jery Shallow Dark Surface (TF12)
Depleted	d Below Dark Sur	face (A11)	Depleted Date	ark Surfac	e (F7)		(	Other (Explain in Remarks)
Thick Da	ark Surface (A12)		Redox Dep	ressions (I	-8)			
Sandy M	lucky Mineral (S1	) <b>(LRR N,</b>	Iron-Manga	nese Mas:	ses (F12) <b>(</b>	LRR N,		
Sandy G	Gleved Matrix (S4)	1		30) face (F13)	(MLRA 13	6, 122)	<sup>3</sup> Inc	dicators of hydrophytic vegetation and
Sandy R	edox (S5)		Piedmont F	loodplain (	Soils (F19)	(MLRA 1	48) w	etland hydrology must be present.
Stripped	Matrix (S6)		Red Parent	Material (	F21) <b>(MLR</b>	À 127, 14	, <b>!7)</b> ur	nless disturbed or problematic.
Restrictive I	Layer (if observe	d):						
Type:								
Depth (ind	ches):						Hydric Soi	l Present? Yes X No
Remarks:								

Attachment 11 Page 125 of 185

#### WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site. Winding Creek	City/County. Stafford County	Sampling Date: March 21, 2014
Applicant/Owner: Winding Creek Owner, LLC	Oky, County:	State: Virginia Sampling Point: DP-F1
Investigator(s): S. Gagnon & J. Muller	Soction Township Pango	
Lendform (hillolone, torroop, etc.): Floodplain Depression		
Candionn (misiope, terrace, etc.)685(		33249 3243
Subregion (LRR or MLRA): Lat: USS	Long: 1170	Datum: NAD83
Soil Map Unit Name: Ce, Cartecay line sandy loarn	V	NWI classification: Palustrine Forested
Are climatic / hydrologic conditions on the site typical for this	ime of year? Yes X No (I	f no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology sig	nificantly disturbed? Are "Normal 0	Circumstances" present? Yes X No
Are Vegetation, Soil, or Hydrology na	turally problematic? (If needed, e>	cplain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map s	howing sampling point location	ns, transects, important features, etc.
Hydrophytic Vegetation Present?       Yes No         Hydric Soil Present?       Yes No         Wetland Hydrology Present?       Yes No	×     Is the Sampled Area       ×     within a Wetland?	Yes NoX
Data Point DP-F1 was collected within the second se	ne Austin Run (Stream F) flo	oodplain near Flag F10.
HYDROLOGY		
Wetland Hydrology Indicators:	5	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all th	at apply)	Surface Soil Cracks (B6)
Surface Water (A1) True	Aquatic Plants (B14)	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2) Hydro	gen Sulfide Odor (C1)	Drainage Patterns (B10)
Saturation (A3) Oxidia	ed Rhizospheres on Living Roots (C3)	Moss Trim Lines (B16)
Water Marks (B1) Prese	nce of Reduced Iron (C4)	Dry-Season Water Table (C2)
Drift Deposits (B3)	Auck Surface (C7)	Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Other	(Explain in Remarks)	Stunted or Stressed Plants (D1)
Iron Deposits (B5)	(	Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	-	Shallow Aquitard (D3)
Water-Stained Leaves (B9)		Microtopographic Relief (D4)
Aquatic Fauna (B13)	-	FAC-Neutral Test (D5)
Field Observations:		
Surface Water Present? Yes No X Dept	h (inches):	
Water Table Present? Yes No X Dept	h (inches):	
Saturation Present? Yes No X Dept	h (inches): Wetland Hy	ydrology Present? Yes No
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, as	erial photos, previous inspections), if avail	able:
Remarks:		

Attachment 11 Page 126 of 185

# **VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point:\_\_\_\_\_\_

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 feet )	% Cover	Species?	Status	Number of Dominant Species
1 Liriodendron tulipifera	40	Yes	FACU	That Are OBL FACW or FAC: $0$ (A)
2 Fagus grandifolia	70	Yes	FACU	
	20	No	FACIL	Total Number of Dominant
3		110	17,000	Species Across All Strata: <u>4</u> (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: $0\%$ (A/B)
6				
7.				Prevalence Index worksheet:
8.				Total % Cover of:Multiply by:
·	130	- Total Cov	or	OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 30 feet )		- 101ai 000	CI	FACW species x 2 =
1 Fagus grandifolia	20	Yes	FACU	FAC species x 3 =
Liriodendron tulinifera	5	Yes	FACU	
	<u> </u>	100		
3				UPL species
4				Column Totals: (A) (B)
5				
6.				Prevalence Index = B/A =
7				Hydrophytic Vegetation Indicators:
0				1 - Rapid Test for Hydrophytic Vegetation
8	- <u></u>			2 - Dominance Test is >50%
9	·			3 - Prevalence Index is < 3.01
10				4 Merphological Adaptations <sup>1</sup> (Provide supporting
	25	= Total Cov	er	
Herb Stratum (Plot size: 15 feet )				data in Remarks or on a separate sheet)
1. Polystichum acrostichoides	2	No	FACU	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
2.				
3				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
4				be present, unless disturbed or problematic.
4				Definitions of Four Vegetation Strata:
5				
6				<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or
7				height
8				lioight
9.				Sapling/Shrub – Woody plants, excluding vines, less
10				than 3 in. DBH and greater than or equal to 3.28 ft (1
44				m) tall.
11				Herb – All herbaceous (non-woody) plants, regardless
12	·			of size, and woody plants less than 3.28 ft tall.
20 foot	2	= Total Cov	er	
Woody Vine Stratum (Plot size: 30 leet )				woody vine – All woody vines greater than 3.28 ft in beight
1				
2	. <u> </u>			
3.				
4				
F				Hydrophytic
5	·			Vegetation
6				Present? Yes No X
	0	= Total Cov	er	
Remarks: (Include photo numbers here or on a separate	sheet.)			
	,			

Attachment 11 Page 127 of 185

Sampling Point:\_\_\_\_

Profile Desc	ription: (Describe	to the de	pth needed to docu	ment the	indicator	or confirm	the absence	e of indicato	ors.)	
Depth	Matrix		Redo	ox Feature	S					
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture		Remarks	
0-1	10YR 2/2	100					organics	·		
1-5	10YR 5/3	100					clay			
5-9	10YR 5/4	98	10YR 5/8	2	С	Μ	clay	very faint	t	
9-14+	10YR 5/4	90	7.5YR 5/8	10	С	М	clay			
		·								
								·		
						. <u> </u>				
$^{1}$ Type: C=C		lotion PM	-Poducod Matrix, M	S-Macko	d Sand Gr		<sup>2</sup> Location: D	– Poro Linin	a M-Matrix	
Hvdric Soil I	Indicators:			S=IVIASKE		an 15.		ators for Pr	oblematic Hvd	ric Soils <sup>3</sup> :
Histosol	(A1)		Dark Surface	e (S7)				2 cm Muck (A	(MI RA 147	7)
Histic Ep	pipedon (A2)		Polyvalue Be	elow Surfa	ice (S8) <b>(N</b>	ILRA 147,	148) (	Coast Prairie	Redox (A16)	)
Black Hi	stic (A3)		Thin Dark S	urface (S9	) (MLRA 1	47, 148)		(MLRA 14)	7, 148)	
Hydroge	n Sulfide (A4)		Loamy Gley	ed Matrix	(F2)		F	Piedmont Flo	odplain Soils (F	19)
Stratified	d Layers (A5)		Depleted Ma	atrix (F3)				(MLRA 13	6, 147)	
2 cm Mu	ick (A10) <b>(LRR N)</b>		Redox Dark	Surface (I	=6)		\	/ery Shallow	Dark Surface (	TF12)
Depleted	d Below Dark Surfac	e (A11)	Depleted Da	rk Surface	e (F7)		(	Other (Explai	n in Remarks)	
Thick Da	ark Surface (A12)		Redox Depr	essions (F	8)					
Sandy iv	100ky Mineral (ST) (I 147 148)	_RR N,	Iron-iviangar		es (F12) (I	LKK N,				
Sandy G	leved Matrix (S4)		Umbric Surf	ace (F13)	(MI RA 13	6, 122)	<sup>3</sup> Inc	dicators of hy	drophytic veget	ation and
Candy C	edox (S5)		Diadmont El	aadalain S			( <b>n</b> )			
Sanuvr				uuuuuuu s			W (84	etiand hvdroi	loav must be bre	
Sandy R	Matrix (S6)		Red Parent	Material (F	5011S (F 19) F21) <b>(MLR</b>	(MLRA 14 A 127, 147	18) W 7) ur	nless disturbe	ed or problemat	ic.
Stripped Restrictive L	Matrix (S6) _ayer (if observed):		Red Parent	Material (F	F21) <b>(MLR</b>	(MLRA 14 A 127, 147	7) ur	nless disturbe	ed or problemat	ic.
Stripped Restrictive L Type:	Matrix (S6) _ayer (if observed):		Red Parent	Material (F	521) <b>(MLR</b>	(MLRA 14 A 127, 147	18) W	nless disturbe	ed or problemat	ic.
Stripped CRestrictive L Type: Depth (ind	Matrix (S6) <b>Layer (if observed)</b> : ches):		Red Parent	Material (F	521) <b>(MLR</b>	(MERA 14 A 127, 147	7) ur Hydric Soi	nless disturbe	ogy must be pro ed or problemat Yes	No X
Stripped Restrictive L Type: Depth (inc Remarks:	Matrix (S6) _ayer (if observed): ches):		Red Parent	Material (F	5018 (P19) F21) <b>(MLR</b>	(MERA 14 A 127, 147	Hydric Soi	nless disturbe	Yes	No X
Sandy K Stripped Restrictive L Type: Depth (inc Remarks:	Matrix (S6) _ayer (if observed): ches):		Red Parent	Material (F	521) <b>(MLR</b> )	(MEKA 14 A 127, 147	Hydric Soi	I Present?	Yes	No X
Stripped Restrictive L Type: Depth (inc Remarks:	Matrix (S6) _ayer (if observed): ches):		Red Parent	Material (F	521) <b>(MLR</b>	(MERA 14 A 127, 147	Hydric Soi	I Present?	Yes	No X
Stripped Restrictive L Type: Depth (ind Remarks:	Matrix (S6) _ayer (if observed): ches):		Red Parent	Material (F	521) <b>(MLR</b>	(MERA 14 A 127, 147	18) w	I Present?	Yes	No X
Stripped Restrictive L Type: Depth (ind Remarks:	Matrix (S6) _ayer (if observed): ches):		Red Parent	Material (F	50115 (F 19) F21) <b>(MLR</b>	(MERA 14 A 127, 147	7) ur	I Present?	Yes	No X
Stripped Restrictive L Type: Depth (inc Remarks:	Matrix (S6) _ayer (if observed): ches):		Red Parent	Material (F	521) <b>(MLR</b>	(MERA 14 A 127, 147	Hydric Soi	I Present?	Yes	No X
Stripped Restrictive L Type: Depth (ind Remarks:	Matrix (S6) _ayer (if observed): ches):		Red Parent	Material (F	521) <b>(MLR</b>	(MERA 14 A 127, 147	Hydric Soi	I Present?	Yes	No X
Stripped Restrictive L Type: Depth (inc Remarks:	Matrix (S6) _ayer (if observed): ches):		Red Parent	Material (F	521) <b>(MLR</b>	(MERA 14 A 127, 147	Hydric Soi	I Present?	Yes	No X
Stripped Restrictive L Type: Depth (inc Remarks:	Matrix (S6) _ayer (if observed): ches):		Red Parent	Material (F	521) <b>(MLR</b>	(MERA 14 A 127, 147	r) ur	I Present?	Yes	No X
Stripped Restrictive L Type: Depth (ind Remarks:	Matrix (S6) <b>_ayer (if observed):</b> ches):		Red Parent	Material (F	521) <b>(MLR</b>	(MERA 14 A 127, 147	r) ur	I Present?	Yes	No X
Stripped Restrictive L Type: Depth (ind Remarks:	Matrix (S6) _ayer (if observed): ches):		Red Parent	Material (F	521) <b>(MLR</b>	(MERA 14 A 127, 147	(B) Wi	I Present?	Yes	No X
Stripped Restrictive L Type: Depth (ind Remarks:	Matrix (S6) _ayer (if observed): ches):		Red Parent	Material (F	521) <b>(MLR</b>	(MERA 14 A 127, 147	/) ur /) Ur Hydric Soi	I Present?	Yes	No X
Stripped Restrictive L Type: Depth (inc Remarks:	Matrix (S6) _ayer (if observed): ches):		Red Parent	Material (F	521) <b>(MLR</b>	(MERA 14 A 127, 147	(B) Wi 7) ur Hydric Soi	I Present?	Yes	No X
Stripped Restrictive L Type: Depth (inc Remarks:	Matrix (S6) _ayer (if observed): ches):		Red Parent	Material (F	521) (MLR	(MLRA 14 A 127, 147	(B) Wi 7) ur Hydric Soi	I Present?	Yes	No X
Stripped Restrictive L Type: Depth (inc Remarks:	Matrix (S6) _ayer (if observed): ches):		Red Parent	Material (F	521) <b>(MLR</b>	(MERA 14 A 127, 147	(B) Wi 7) ur Hydric Soi	I Present?	Yes	No X
Stripped Restrictive L Type: Depth (ind Remarks:	Matrix (S6) _ayer (if observed): ches):		Red Parent	Material (F	521) <b>(MLR</b>	(MERA 14 A 127, 147	(B) Wi 7) ur Hydric Soi	I Present?	Yes	No X
Stripped Restrictive L Type: Depth (inc Remarks:	Matrix (S6) _ayer (if observed): ches):		Red Parent	Material (F	521) <b>(MLR</b>	(MLKA 14 A 127, 147	/) ur /) Ur Hydric Soi	I Present?	Yes	No X
Stripped Restrictive L Type: Depth (inc Remarks:	Matrix (S6) _ayer (if observed): ches):		Red Parent	Material (F	521) (MLR	(MLRA 14 A 127, 147	(B) Wi (7) ur Hydric Soi	I Present?	Yes	No X
Salidy K Stripped Restrictive L Type: Depth (inc Remarks:	Matrix (S6) _ayer (if observed): ches):		Red Parent	Material (F	521) (MLR.	(MLRA 14 A 127, 147	(B) Wi (7) ur Hydric Soi	I Present?	Yes	No X
Salidy K Stripped Restrictive L Type: Depth (inc Remarks:	Matrix (S6) _ayer (if observed): ches):		Red Parent	Material (F	521) <b>(MLR</b>	(MLRA 14 A 127, 147	/) ur /) Ur Hydric Soi	I Present?	Yes	No X
Stripped Restrictive L Type: Depth (ind Remarks:	Matrix (S6) _ayer (if observed): ches):		Red Parent	Material (F	50115 (F 19) F21) (MLR	(MLRA 14 A 127, 147	(B) Wi 7) ur Hydric Soi	I Present?	Yes	No X
Salidy K Stripped Restrictive L Type: Depth (inc Remarks:	Matrix (S6) _ayer (if observed): ches):		Red Parent	Material (F	50115 (F 19) F21) (MLR	(MLRA 14 A 127, 147	(B) Wi 7) ur Hydric Soi	I Present?	Yes	No X
Stripped Restrictive L Type: Depth (inc Remarks:	Matrix (S6) _ayer (if observed): ches):		Red Parent	Material (F	521) (MLR.	(MLRA 14 A 127, 147	(B) Wi (7) ur Hydric Soi	I Present?	Yes	No X

Attachment 11 Page 128 of 185

#### WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

	and ricamon region
Project/Site: Winding Creek City/County: Stafford Cou	unty Sampling Date: March 24, 2014
Applicant/Owner: Winding Creek Owner, LLC	State: Virginia Sampling Point: DP-G1
Investigator(s): S. Gagnon & J. Muller Section, Township, Range:	
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex,	none): Concave Slope (%): 2%
Subregion (LRR or MLRA): LRR P Lat: <u>6849344.6627</u> Long: <u>1</u>	1782795.8078 Datum: NAD83
Soil Map Unit Name: OrB, Orange loam, 2 to 6 percent slopes	NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes $\_$ X No	(If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Nor	mal Circumstances" present? Yes <u>×</u> No
Are Vegetation, Soil, or Hydrology naturally problematic? (If neede	d, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing sampling point loca	tions, transects, important features, etc.
Hydrophytic Vegetation Present?       Yes       X       No       Is the Sampled Are within a Wetland?         Hydric Soil Present?       Yes       X       No       No       within a Wetland?         Wetland Hydrology Present?       Yes       X       No       No       within a Wetland?         Remarks:       Data Point DP-G1 was collected within Wetland G near Flags G3	ea Yes <u>×</u> No <u></u> 84/G36.
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
Surface Water (A1) True Aquatic Plants (B14)	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2) Hydrogen Sulfide Odor (C1)	Drainage Patterns (B10)
Saturation (A3) Oxidized Rnizospheres on Living Roots (C	3) Moss Thin Lines (B16)
Videl Marks (b1) Presence of Reduced from (C4)	Cravifish Burrows (C8)
Drift Deposits (B3)	Saturation Visible on Aerial Imagery (C0)
Algal Mat or Crust (B4) Other (Explain in Remarks)	Stunted or Stressed Plants (D1)
Iron Denosite (B5)	Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)
X Water-Stained Leaves (B9)	Microtopographic Relief (D4)
Aquatic Fauna (B13)	FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes X No Depth (inches): < 1 inch	
Water Table Present? Yes No X Depth (inches):	
Saturation Present? Yes <u>No X</u> Depth (inches): Wetlan	d Hydrology Present? Yes <u>×</u> No
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if	available:
Pomarka:	

Attachment 11 Page 129 of 185

## **VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point:\_\_\_\_\_

	Absolute	Dominant I	ndicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 feet )	% Cover	Species?	Status	Number of Dominant Species
<sub>1.</sub> Acer rubrum	75	Yes	FAC	That Are OBL, FACW, or FAC: (A)
2. Liquidambar styraciflua	5	No	FAC	
3. Ilex opaca	5	No	FACU	I otal Number of Dominant Species Across All Strata: 6 (B)
4				
5				Percent of Dominant Species
°				That Are OBL, FACW, of FAC: (A/B)
7				Prevalence Index worksheet:
۰ ٥	- <u> </u>			Total % Cover of: Multiply by:
8	85	Tatal Cause		OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 30 feet )		= Total Cove	ſ	FACW species x 2 =
1 Liquidambar styraciflua	20	Yes	FAC	FAC species x 3 =
2 Vaccinium sp.	5	No	N/A	FACU species x 4 =
2. llex opaca	5	No	FACU	
Acer ruhrum	20	Yes	FAC	Column Totolo: (A) (P)
		103	170	(A) (B)
5	- <u> </u>			Prevalence Index = B/A =
8	·			Hydrophytic Vegetation Indicators:
7				1 - Rapid Test for Hydrophytic Vegetation
8	- <u></u>			× 2 - Dominance Test is >50%
9				3 - Prevalence Index is ≤3.0 <sup>1</sup>
10				4 - Morphological Adaptations <sup>1</sup> (Provide supporting
Horb Stratum (Plot aize: 15 feet	50	= Total Cove	r	data in Remarks or on a separate sheet)
<u>Smilay rotundifolia</u>	2	No	FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
Liquidambar styraciflua	5	Ves	FAC	
	5	Vec	FAC	<sup>1</sup> Indicators of hydric soil and wotland hydrology must
	<u> </u>	No		be present, unless disturbed or problematic.
4. nex opaca		INU	FACO	Definitions of Four Vegetation Strata:
5	- <u> </u>			
6				<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or
7				height.
8				
9				<b>Sapling/Shrub</b> – Woody plants, excluding vines, less than 3 in DBH and greater than or equal to 3.28 ft (1
10				m) tall.
11				
12				<b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3 28 ft tall
	14	= Total Cove	r	
Woody Vine Stratum (Plot size: 30 feet )				<b>Woody vine</b> – All woody vines greater than 3.28 ft in
1. Smilax rotundifolia	5	Yes	FAC	neight.
2				
3				
4				
5.				Hydrophytic
6.				Present? Yes X No
	5	= Total Cove	r	
Remarks: (Include photo numbers here or on a separate	sheet )			
Remarks. (include proto numbers here of on a separate	sheet.)			

SOIL								Sampling Point:
Profile Des	cription: (Describ	e to the de	pth needed to docu	ment the	indicator	or confir	m the absence	of indicators.)
Depth	Matrix		Red	ox Feature	es			
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-8	10YR 5/1	70	10YR 5/8	30	С	Μ	clay	
8-12	10YR 5/2	70	10YR 5/8	30	С	Μ	clay	
	·							
		<u> </u>						
	·							
<sup>1</sup> Type: C=C	Concentration. D=De	epletion. RN	A=Reduced Matrix. M	IS=Maske	d Sand Gr	ains.	<sup>2</sup> Location: PL	=Pore Lining, M=Matrix,
Hydric Soil	Indicators:						Indica	ators for Problematic Hydric Soils <sup>3</sup> :
Histoso	l (A1)		Dark Surfac	e (S7)			2	cm Muck (A10) <b>(MLRA 147)</b>
Histic E	pipedon (A2)		Polyvalue B	elow Surfa	ace (S8) <b>(I</b>	/ILRA 147	7, <b>148)</b> C	oast Prairie Redox (A16)
Black H	listic (A3)		Thin Dark S	Surface (SS	9) <b>(MLRA</b> '	147, 148)		(MLRA 147, 148)
Hydrog	en Sulfide (A4)		Loamy Gley	ed Matrix	(F2)		P	iedmont Floodplain Soils (F19)
Stratifie	ed Layers (A5)		X Depleted M	atrix (F3)				(MLRA 136, 147)
2 cm M	uck (A10) (LRR N)		Redox Dark	Surface (	F6)		V	ery Shallow Dark Surface (TF12)
Deplete	ed Below Dark Suffa	ace (A11)	Depleted Da	ark Surface	e (F7) -o)		0	other (Explain in Remarks)
Thick D	Mucky Minoral (S1)			ressions (r	-o) 			
Sanuy i MI R	<b>Δ 147 148</b> )	LKK N,	MIRA 1	36)	565 (F12) (	LKK N,		
Sandy (	Gleved Matrix (S4)		Umbric Surf	ace (F13)	(MLRA 13	36, 122)	<sup>3</sup> Ind	icators of hydrophytic vegetation and
Sandy I	Redox (S5)		Piedmont F	loodplain \$	Soils (F19)	(MLRA 1	<b>48)</b> we	tland hydrology must be present,
Strippe	d Matrix (S6)		Red Parent	Material (I	F21) (MLR	À 127, 14	<b>17)</b> uni	less disturbed or problematic.
Restrictive	Layer (if observed	d):						
Type:								
Depth (ir	nches):						Hydric Soil	Present? Yes X No
Remarks:							1	

Attachment 11 Page 131 of 185

#### WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Winding Creek	Citv/County: Sta	Ifford County Sampling Date: March 24, 2014
Applicant/Owner: Winding Creek Owner, LLC		State: Virginia Sampling Point: DP-G2
Investigator(s). S. Gagnon & J. Muller	Section Townshi	in Pance:
Landform (hillolong, torrage, etc.); Hillslope		p, range
	Local Teller (concave	s, convex, none)
Subregion (LRR or MLRA):	Lat: 0043200.1003	_ Long: Datum:
Soil Map Unit Name: OIB, Orange Ioam, 2 to 6		NWI classification: N/A
Are climatic / hydrologic conditions on the site typic	cal for this time of year? Yes	No (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology	significantly disturbed?	Are "Normal Circumstances" present? Yes X No
Are Vegetation, Soil, or Hydrology	naturally problematic?	(If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach sit	e map showing sampling po	bint locations, transects, important features, etc.
Hydrophytic Vegetation Present?       Yes         Hydric Soil Present?       Yes         Wetland Hydrology Present?       Yes         Remarks:       Yes	No         X         Is the Sar           No         X         within a V           No         X         V	npled Area Netland? Yes NoX
Data Point DP-G2 was collected	just upslope of Wetland C	3 near Flag G32.
HYDROLOGY		
Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; of	check all that apply)	Surface Soil Cracks (B6)
Surface Water (A1)	True Aquatic Plants (B14)	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)	Hydrogen Sulfide Odor (C1)	Drainage Patterns (B10)
Saturation (A3)	Oxidized Rhizospheres on Living	I Roots (C3) Moss Trim Lines (B16)
Water Marks (B1)	Presence of Reduced Iron (C4)	Dry-Season Water Table (C2)
Sediment Deposits (B2)	Recent Iron Reduction in Tilled S	Soils (C6) Crayfish Burrows (C8)
Drift Deposits (B3)	Thin Muck Surface (C7)	Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Other (Explain in Remarks)	Stunted or Stressed Plants (D1)
Iron Deposits (B5)		Geomorphic Position (D2)
Water Stained Leaves (R0)		Silailow Aquitato (DS)
Aquatic Fauna (B13)		EAC-Neutral Test (D5)
Field Observations:		
Surface Water Present? Yes No	X Depth (inches):	
Water Table Present? Yes No	X Depth (inches):	-
Saturation Present? Yes No	X Depth (inches):	Wetland Hydrology Present? Yes No
(includes capillary fringe) Describe Recorded Data (stream gauge, monitor	ring well, aerial photos, previous inspe	
Remarks:		

Attachment 11 Page 132 of 185

# **VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: DP-G2

	Absolute	Dominant	Indicator	Dominance Test worksheet:	
Tree Stratum (Plot size: 30 feet )	% Cover	Species?	Status	Number of Dominant Species	
<sub>1.</sub> Acer rubrum	60	Yes	FAC	That Are OBL, FACW, or FAC: 3	(A)
2. Liriodendron tulipifera	40	Yes	FACU	Total Number of Dominant	
<sub>3.</sub> Carya alba	10	No	UPL	Species Across All Strata: 6	(B)
4					,
5				That Are OBL FACW or FAC: 50%	(A/B)
6.					_ (///////
7.				Prevalence Index worksheet:	
8.				Total % Cover of: Multiply by:	
	110	= Total Cov	er	OBL species x 1 =	
Sapling/Shrub Stratum (Plot size: 30 feet )				FACW species x 2 =	
<sub>1.</sub> Ilex opaca	10	No	FACU	FAC species x 3 =	
2. Liriodendron tulipifera	40	Yes	FACU	FACU species x 4 =	
3. Acer rubrum	20	Yes	FAC	UPL species x 5 =	
4.				Column Totals: (A)	(B)
5.					
6.				Prevalence Index = B/A =	
7.				Hydrophytic Vegetation Indicators:	
8	·			1 - Rapid Test for Hydrophytic Vegetation	
Q.		·		2 - Dominance Test is >50%	
9	·	·		3 - Prevalence Index is ≤3.0 <sup>1</sup>	
10	70	- Total Cov		4 - Morphological Adaptations <sup>1</sup> (Provide su	pporting
Herb Stratum (Plot size: <sup>15 feet</sup> )			ei	data in Remarks or on a separate shee	t)
1. Dendrolycopodium obscurum	30	Yes	FACU	Problematic Hydrophytic Vegetation <sup>1</sup> (Exp	ain)
2. Ilex opaca	2	No	FACU		
3.				<sup>1</sup> Indicators of hydric soil and wetland hydrology	must
4.				be present, unless disturbed or problematic.	
5.				Definitions of Four Vegetation Strata:	
¢	·			<b>Tree</b> – Woody plants, excluding vines, 3 in, (7,	6 cm) or
7		·		more in diameter at breast height (DBH), regar	dless of
8				height.	
0	·	·		Sapling/Shrub – Woody plants, excluding vine	s, less
9	·	·		than 3 in. DBH and greater than or equal to 3.2	28 ft (1
10		·		m) tall.	
10	·			Herb - All herbaceous (non-woody) plants, reg	jardless
12	32			of size, and woody plants less than 3.28 ft tall.	
Woody Vine Stratum (Plot size: 30 feet )	02	= I otal Cov	er	Woody vine – All woody vines greater than 3.2	28 ft in
1 Lonicera japonica	5	Yes	FAC	height.	
2	·				
3		·			
4					
5				Hydrophytic	
S	·	·		Vegetation	
0	5	- Total Cov		Present? fes No _^	-
			ei		
Remarks: (Include photo numbers here or on a separate	sheet.)				

Attachment 11 Page 133 of 185 Sampling Point: DP-G2

10010	Motrix		Ded	av Faatur				
inches)	Color (moist)	%	Color (moist)	<u>ox Feature</u> %	<u>es</u> Type <sup>1</sup>	Loc <sup>2</sup>	Texture Remark	(S
)-4	10YR 4/3	100					clay	
-10	10YR 5/4	90	10YR 5/8	5	С	М	clay	
			2.5Y 5/3	5	D	М	clay	
0-14	10YR 5/6	70	2.5Y 5/3	30	D	Μ	clay	
ype: C=C	concentration, D=D	epletion, RI	/	IS=Maske	d Sand Gr	ains.	<sup>2</sup> Location: PL=Pore Lining, M=Matri	X.
dric Soil	Indicators:						Indicators for Problematic	Hydric Soils":
_ HISTOSO	I (A1) ninadan (A2)		Dark Surfac	e (S7)			2 cm Muck (A10) (MLR/	<b>A 147)</b>
Black H	pipedoli (A2)		Thin Dark S	urface (SC	ace (So) (n a) (MI RA 1	12KA 147	(MI RA 147 148)	0)
Hydroge	en Sulfide (A4)		Loamy Glev	ed Matrix	(F2)	147, 140)	Piedmont Floodplain So	ils (F19)
_ Tryaroge Stratifie	d Lavers (A5)		Depleted M	atrix (F3)	(1 2)		(MI RA 136, 147)	10 (1 10)
2 cm M	uck (A10) (LRR N)		Redox Dark	Surface (	F6)		Verv Shallow Dark Surfa	ace (TF12)
Deplete	d Below Dark Surf	ace (A11)	Depleted Da	ark Surfac	e (F7)		Other (Explain in Remai	:ks)
 Thick D	ark Surface (A12)		Redox Depr	essions (F	=8)			
Sandy M	Mucky Mineral (S1)	(LRR N.	Iron-Manga	nese Mas	ses (F12) <b>(</b>	LRR N.		
MIR	A 147, 148)	(,	MIRA 1	36)	····/(	,		
Sandy (	Gleved Matrix (S4)		Umbric Surf	ace (F13)	(MLRA 13	6, 122)	<sup>3</sup> Indicators of hydrophytic y	vegetation and
Sandy F	Redox (S5)		Piedmont F	loodplain (	Soils (F19)	(MLRA 1	48) wetland hydrology must b	e present.
Stripped	d Matrix (S6)		Red Parent	Material (	F21) (MLR	、 A 127, 14	7) unless disturbed or proble	ematic.
estrictive	Layer (if observed	d):			, (			
Type:								
Depth (in	iches):						Hydric Soil Present? Yes	No X
omarka:								

Attachment 11 Page 134 of 185

#### WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

		111111/	110		Lustern			ioni Neg		
Project/Site: Winding Creek				City/C	ounty: Staff	tord County		_ Sampling	Date: March	24, 2014
Applicant/Owner: Winding C	reek Owne	er, LLC	;				State: Virgini	a Sampli	ng Point: DP-	G3
Investigator(s): S. Gagnon &	J. Muller			Sectio	on, Township	, Range:				
Landform (hillslope, terrace, et	c.): Depres	ssion		Local reli	ef (concave,	convex, none	e): Concave		Slope (%):	4%
Subregion (LRR or MLRA): LI	RR P		Lat:	6848995.1838		Long: 1178	2833.3915		Datum: NAD	083
Soil Map Unit Name: OrB, O	range loan	n, 2 to	6 per	cent slopes			NWI classif	ication: N	/A	
Are climatic / hydrologic condit	ions on the	site typ	ical fo	r this time of year? Y	es <u>X</u> N	No (I	f no, explain in	Remarks.)		
Are Vegetation , Soil	, or Hy	drology	,	significantly distur	bed?	Are "Normal (	Circumstances"	present?	Yes X N	lo
Are Vegetation , Soil	, or Hy	drology	,	naturally problema	atic? (	(If needed, ex	plain any answ	ers in Rema	arks.)	
	GS – Atta	ach si	to m	an showing sam	nling noi	nt location	' s transact	s imnorf	ant feature	s etc
Hydrophytic Vegetation Pres Hydric Soil Present? Wetland Hydrology Present? Remarks: Data Point DP-G3 v	ent? vas colle	Yes _ Yes _ Yes _	× × ×	No No No nin Wetland G	Is the Sam within a We near Flag	ipled Area fetland? ngs G16/0	Yes <u>×</u> 618.	No		
HYDROLOGY										
Wetland Hydrology Indicat	ors:	مار مار	- h l			<u>-</u>	Secondary India	ators (minir	num of two rec	quired)
X Surface Water (A1)	or one is re	<u>quirea;</u>	CNECK	<u>( all that apply)</u>	B14)		Surrace So	I Cracks (B	o) Deave Surface	(B9)
High Water Table (A2)				Hydrogen Sulfide Od	r(C1)	-	Drainage P	atterns (B10		; (DO)
Saturation (A3)				Oxidized Rhizosphere	es on Living F	Roots (C3)	Moss Trim	Lines (B16)	,	
Water Marks (B1)				Presence of Reduced	I Iron (C4)	. , -	Dry-Seasor	Water Tab	le (C2)	
Sediment Deposits (B2)				Recent Iron Reductio	n in Tilled So	oils (C6)	Crayfish Bu	rrows (C8)		
Drift Deposits (B3)				Thin Muck Surface (C	27)	-	Saturation	/isible on A	erial Imagery (	C9)
Algal Mat or Crust (B4)				Other (Explain in Ren	narks)	-	Stunted or	Stressed Pla	ants (D1)	
Iron Deposits (B5)						-	Geomorphi	c Position (I	02)	
Inundation Visible on Ae	rial Imagery	(B7)				-	Shallow Aq	uitard (D3)		
Water-Stained Leaves (E	39)					-	Microtopog	raphic Relie	t (D4)	
Field Observations:					г	-		ai 1851 (DO)		
Surface Water Present?	Yes X	No		Depth (inches) $< 1$	inch					
Water Table Present?	Yes	<u>No</u>	×	Depth (inches):	-					
Saturation Present?	Yes	No	×	Depth (inches):		Wetland Hy	drology Prese	nt? Yes	<u>×</u> No_	
(Includes capillary fringe)	eam daude	monito	rina w	ell, aerial photos, pre	vious inspect	tions), if avail	able:			
				, priotoo, pro		,, in arain				
Remarks:										

Attachment 11 Page 135 of 185

## **VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: DP-G3

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 feet )	% Cover	Species?	Status	Number of Dominant Species
<sub>1.</sub> Acer rubrum	50	Yes	FAC	That Are OBL, FACW, or FAC: <sup>5</sup> (A)
2 Liquidambar stvraciflua	50	Yes	FAC	
2. 1		·		Total Number of Dominant
3		·		Species Across All Strata: (B)
4		·		Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 71% (A/B)
6.				
7				Prevalence Index worksheet:
0		·		Total % Cover of: Multiply by:
0	100			OBL species x 1 =
Sopling/Shrub Stratum (Plot size: 30 feet	100	= Total Cov	er	FACW species x 2 =
Eagus grandifolia	5	Vec	FACU	
		103	TA00	FAC species x 3 =
2. Liquidambar styracifiua	20	Yes	FAC	FACU species x 4 =
3				UPL species x 5 =
4.				Column Totals: (A) (B)
5				
0		·		Prevalence Index = B/A =
o		·		Hydrophytic Vegetation Indicators:
7		·		1 - Rapid Test for Hydrophytic Vegetation
8				X 2 Deminence Test is 50%
9				
10				3 - Prevalence Index is ≤3.0'
	25	- Total Cov	or	4 - Morphological Adaptations <sup>1</sup> (Provide supporting
Herb Stratum (Plot size: 15 feet )		- 101ai 000	C1	data in Remarks or on a separate sheet)
1 Liquidambar styraciflua	10	Yes	FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
	5	Ves	FACIL	
2. Nex opaca		<u> </u>	TA00	
3. Smilax rotundiiolla	5	Yes	FAC	he present unless disturbed or problematic
4				
5				Definitions of Four Vegetation Strata:
6				<b>Tree</b> – Woody plants, excluding vines, 3 in, (7.6 cm) or
7		·		more in diameter at breast height (DBH), regardless of
7				height.
8		·	<u> </u>	<b>Conting/Chrub</b> Weady plants avaluating vince loss
9		·		than 3 in DBH and greater than or equal to 3.28 ft (1
10				m) tall.
11.				
12				Herb – All herbaceous (non-woody) plants, regardless
·-·	20	- Total Cov	or	of size, and woody plants less than 3.28 ft tall.
Woody Vine Stratum (Plot size: 30 feet )		= 101ai 000	<b>CI</b>	Woody vine – All woody vines greater than 3.28 ft in
1				height.
1		·		
2		·		
3		·		
4				
5				Hydrophytic
6.				Present? Yes X No
	0	- Total Cov		
		- 10101 000		
	sileet.)			

SOIL								Samplinç	g Point:	00	
Profile Desc	cription: (Describ	be to the dep	oth needed to docu	ment the	indicator	or confirm	n the absence of	of indicators.)			
Depth	Matrix	[	Red	ox Feature	S						
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Rer	marks		
0-3	2.5Y 4/3	90	10YR 5/8	10	С	Μ	clay				
3-12+	2.5Y 6/2	70	10YR 5/6	30	С	Μ	clay				
				<u> </u>		·					
				·	·	·					
					·	·	<u> </u>				
							<u> </u>				
					. <u> </u>						
						·					
					·	·	<u> </u>				
<sup>1</sup> Type: C=C	oncentration, D=D	epletion, RM	=Reduced Matrix, N	IS=Maske	d Sand Gr	ains.	<sup>2</sup> Location: PL=	=Pore Lining, M=N	vlatrix.		
Hydric Soil	Indicators:						Indicat	ors for Problem	atic Hydric S	Soils <sup>3</sup> :	
Histosol	(A1)		Dark Surfac	e (S7)			2 0	m Muck (A10) <b>(M</b>	ILRA 147)		
Histic Ep	pipedon (A2)		Polyvalue B	elow Surfa	ice (S8) <b>(N</b>	ILRA 147	, <b>148)</b> Co	ast Prairie Redox	(A16)		
Black Hi	istic (A3)		Thin Dark S	urface (S9	) <b>(MLRA</b> 1	47, 148)		(MLRA 147, 148)	1		
Hydroge	en Sulfide (A4)		Loamy Gley	ed Matrix	(F2)		Pie	edmont Floodplair	n Soils (F19)		
Stratified	d Layers (A5)		Depleted Ma	atrix (F3)	-0)			(MLRA 136, 147)		0)	
2 cm ML	JCK (A1U) <b>(LKK N)</b> d Bolow Dark Surf		Redox Dark	Surface (I	-6) > (E7)		Very Shallow Dark Sufface (TF12)				
Depleted	ark Surface (A12)		Depleted Da	essions (F	(17) (8)		0		marksj		
Sandy M	/uckv Mineral (S1)	) (LRR N.	Iron-Mangar	nese Mass	es (F12) <b>(</b>	LRR N.					
MLRA	A 147, 148)		MLRA 1	36)		,					
Sandy G	Gleyed Matrix (S4)		Umbric Surf	ace (F13)	(MLRA 13	6, 122)	<sup>3</sup> Indic	ators of hydrophy	ytic vegetatio	n and	
Sandy R	Redox (S5)		Piedmont FI	oodplain S	Soils (F19)	(MLRA 14	<b>48)</b> wetland hydrology must be present,				
Stripped	I Matrix (S6)		Red Parent	Material (F	21) <b>(MLR</b>	A 127, 14	7) unle	ess disturbed or p	roblematic.		
Restrictive I	Layer (if observe	d):									
Type:											
Depth (in	ches):						Hydric Soil F	resent? Yes	<u> </u>		
Remarks:							•				

Attachment 11 Page 137 of 185

## WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Winding Creek	City/County: Stafford Count	ty Samp	Sampling Date: March 21, 2014		
Applicant/Owner: Winding Creek Owner, LLC			npling Point: DP-UPL1		
Investigator(s): S. Gagnon & J. Muller	Section, Township, Range: _				
Landform (hillslope, terrace, etc.): Hillslope	Local relief (concave, convex, no	<sub>ne):</sub> Concave	Slope (%): 4%		
Subregion (LRR or MLRA): LRR P Lat: 684	9973.6809 Long: 117	783414.0256	Datum: NAD83		
Soil Map Unit Name: AIC2, Appling fine sandy loam, 6 t	o 15 percent slopes, eroded	NWI classification:	N/A		
Are climatic / hydrologic conditions on the site typical for this	time of year? Yes X No	(If no, explain in Remarks	5.)		
Are Vegetation, Soil, or Hydrology sig	nificantly disturbed? Are "Norma	l Circumstances" present	? Yes 🗙 No		
Are Vegetation, Soil, or Hydrology na	turally problematic? (If needed,	explain any answers in Re	emarks.)		
SUMMARY OF FINDINGS – Attach site map s	howing sampling point location	ons, transects, imp	ortant features, etc.		
Hydrophytic Vegetation Present?       Yes No         Hydric Soil Present?       Yes No         Wetland Hydrology Present?       Yes No         Remarks:       Data Point DP-UPL1 was collected with	x Is the Sampled Area within a Wetland?	Yes No	oX		
Property, upslope and west of Wetland	D.				
HYDROLOGY					
Wetland Hydrology Indicators:		Secondary Indicators (m	ninimum of two required)		
Primary Indicators (minimum of one is required: check all th	at apply)	Surface Soil Cracks	(B6)		

Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
Surface Water (A1) True Aquatic Plants (B14)	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2) Hydrogen Sulfide Odor (C	1) Drainage Patterns (B10)
Saturation (A3) Oxidized Rhizospheres or	Living Roots (C3) Moss Trim Lines (B16)
Water Marks (B1) Presence of Reduced Iror	(C4) Dry-Season Water Table (C2)
Sediment Deposits (B2) Recent Iron Reduction in	Filled Soils (C6)       Crayfish Burrows (C8)
Drift Deposits (B3) Thin Muck Surface (C7)	Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Other (Explain in Remarks	s) Stunted or Stressed Plants (D1)
Iron Deposits (B5)	Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)
Water-Stained Leaves (B9)	Microtopographic Relief (D4)
Aquatic Fauna (B13)	FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes X No Depth (inches): < 1 inch	
Water Table Present? Yes No X Depth (inches):	
Saturation Present? Yes <u>No X</u> Depth (inches): (includes capillary fringe)	Wetland Hydrology Present? Yes X No
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous	s inspections), if available:
Remarks:	

Attachment 11 Page 138 of 185

# **VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: DP-UPL1

	Absolute	Dominant	Indicator	Dominance Test worksheet:	
<u>Tree Stratum</u> (Plot size: <u>30 feet</u> )	% Cover	Species?	Status	Number of Dominant Species	
1				That Are OBL, FACW, or FAC: 0 (A)	
2				Total Number of Deminerat	
3.				Species Across All Strata: 1 (B)	
4	_				
5	_			Percent of Dominant Species	
3				That Are OBL, FACW, or FAC: (A/	B)
6				Prevalence Index worksheet:	
7				Total % Cover of: Multiply by:	
8					
20 feet	0	= Total Cov	er		
Sapling/Shrub Stratum (Plot size: 30 leel )	_			FACW species x 2 =	
1. Fagus grandifolia	5	Yes	FACU	FAC species x 3 =	
2				FACU species x 4 =	
3				UPL species x 5 =	
4.				Column Totals: (A) (E	3)
5					,
S			·	Prevalence Index = B/A =	
o			·	Hydrophytic Vegetation Indicators:	
7				1 - Rapid Test for Hydrophytic Vegetation	
8				2 - Dominance Test is >50%	
9				2  Drownlance results > 00 / 0	
10				3 - Prevalence Index is \$3.0	
	5	= Total Cov	er	4 - Morphological Adaptations' (Provide supporti	ng
Herb Stratum (Plot size: 15 feet )				data in Remarks or on a separate sheet)	
1				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
2	_				
				<sup>1</sup> Indicators of hydric soil and wetland hydrology must	
3				be present, unless disturbed or problematic.	
4				Definitions of Four Vegetation Strata:	
5					
6				<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm)	or
7				height	JT
8					
9.				Sapling/Shrub - Woody plants, excluding vines, less	3
10	_			than 3 in. DBH and greater than or equal to 3.28 ft (1	
11					
40				Herb - All herbaceous (non-woody) plants, regardles	s
12				of size, and woody plants less than 3.28 ft tall.	
Woody Vino Stratum (Plot size: 30 feet	0	= Total Cov	er	Woody vine - All woody vines greater than 3.28 ft in	
				height.	
1				Ĭ	
2					
3					
4					
5				Hydrophytic	
6.				Present? Yes No X	
	0	= Total Cov	er		
Remarks: (Include photo numbers here or on a separate	sheet.)				

Profile Desc	rintion: (Describe	to the de	nth needed to docu	mont the	indicator	or confir	n the absence	of indicators )
Donth	Motrix				mulcator		in the absence	of indicators.)
(inches)	Color (moist)	%	Color (moist)	<u>5x reature</u> %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-4	10YR 5/4	65	5YR 5/8	35	С	М	clay	
4-14	2.5Y 5/3	80	10YR 3/4	20	С	Μ	clay	
14-17+	2.5Y 5/3	90	2.5Y 5/6	10	С	Μ	clay	faint
						·		
						·		
						·		
						·		
<sup>1</sup> Type: C=Co	oncentration, D=De	pletion, RN	I=Reduced Matrix, M	IS=Maske	d Sand Gr	ains.	<sup>2</sup> Location: PL	_=Pore Lining, M=Matrix.
Hydric Soll			Darile Curfae	- (C7)			Indica	ators for Problematic Hydric Solis :
HISTOSOI	(A1)		Dark Surfac	e (S7) clow Surf			2 149)	C CM MUCK (A10) (MLRA 147)
	stic $(A2)$		Folyvalue D			1LKA 147	, 140)	(MI DA 147 149)
	$\operatorname{Suc}(A3)$			ad Matrix	(E2)	47, 140)	E	(MERA 147, 140)
Tryuloge			Loaniy Gley	eu Maliix	(ГZ)		F	
Stratilied			Depleted Ma	Surface (	E6)		N.	(MLRA 130, 147)
2 cm with	d Bolow Dark Surfa	co (A11)		Suilace (	CO)		v	ther (Explain in Remarks)
Depieted	a Below Dark Sulla		Depieted Da		= ( - 7 )			
Thick Da	Ark Sunace (A12) Aucky Minoral (S1)				-0) coc (E12) <b>(</b>			
Sandy IV	<b>147.148</b> )		MLRA 1	1656 10185: 36)	565 (112) (	LNN N,		
Sandy G	Bleyed Matrix (S4)		Umbric Surf	ace (F13)	(MLRA 13	6, 122)	<sup>3</sup> Ind	licators of hydrophytic vegetation and
Sandy R	edox (S5)		Piedmont Fl	oodplain \$	Soils (F19)	(MLRA 1	<b>48)</b> we	etland hydrology must be present,
Stripped	Matrix (S6)		Red Parent	Material (	F21) <b>(MLR</b>	A 127, 14	<b>7)</b> un	less disturbed or problematic.
Restrictive I	_ayer (if observed	):						
Type:								
Depth (ind	ches):						Hydric Soil	Present? Yes <u>No X</u>
Remarks:								

Attachment 11 Page 140 of 185

### WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Winding Creek	City/County: Stafford County Sampling Date: March 21, 2014						
Applicant/Owner: Winding Creek Owner, LLC	State: Virginia Sampling Point: DP-UPL2						
Investigator(s): S. Gagnon & J. Muller	Section. Township. Range:						
Landform (billslope terrace etc.). Topographic feature	ocal relief (concave convex none). Concave Slope (%): 23%						
Subregion (I RR or MI RA). LRR P	055 Long: 11783517.9183 Datum: NAD83						
Soil Map Unit Name: AsD, Ashlar fine sandy loam, 6 to 15 per	cent slopes NWI classification: N/A						
Are climatic / hvdrologic conditions on the site typical for this time of	vear? Yes X No (If no. explain in Remarks.)						
Are Vegetation . Soil . or Hydrology significant	tly disturbed? Are "Normal Circumstances" present? Yes × No						
Are Vegetation . Soil . or Hydrology naturally r	problematic? (If needed, explain any answers in Remarks.)						
SUMMARY OF FINDINGS – Attach site man showin	a campling point locations, transacts, important features, etc.						
Sommart of Findings – Attach site map shown	ig sampling point locations, transects, important reatures, etc.						
Hydrophytic Vegetation Present?       Yes No         Hydric Soil Present?       Yes No         Wetland Hydrology Present?       Yes No         Remarks:       Yes No	Is the Sampled Area       within a Wetland?     Yes NoX						
	Secondary Indicators (minimum of two required)						
Drimony Indicators (minimum of one is required; sheek all that apply	Surface Seil Creake (PE)						
Primary indicators (minimum of one is required; check all that apply	Surface Soil Cracks (B6)     Sparsoly Vegetated Conceive Surface (R9)						
X High Water Table (A2)	Ifide Odor (C1) Drainage Patterns (B10)						
× Saturation (A3) Oxidized Rhiz	zospheres on Living Roots (C3) Moss Trim Lines (B16)						
Water Marks (B1) Presence of I	Reduced Iron (C4) Dry-Season Water Table (C2)						
Sediment Deposits (B2) Recent Iron F	Reduction in Tilled Soils (C6) Crayfish Burrows (C8)						
Drift Deposits (B3) Thin Muck Su	urface (C7) Saturation Visible on Aerial Imagery (C9)						
Algal Mat or Crust (B4) Other (Explai	in in Remarks) Stunted or Stressed Plants (D1)						
Iron Deposits (B5)	Geomorphic Position (D2)						
Water-Stained Leaves (B9)	Shallow Aquitato (D3) Microtopographic Relief (D4)						
Aquatic Fauna (B13)	FAC-Neutral Test (D5)						
Field Observations:							
Surface Water Present? Yes No X Depth (inche	es):						
Water Table Present? Yes X No Depth (inche	es): 9 inches						
Saturation Present? Yes X No Depth (inche	es): 9 inches Wetland Hydrology Present? Yes X No						
(Includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial pho	otos, previous inspections), if available:						
Remarks:							

Attachment 11 Page 141 of 185

## **VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point:\_\_\_\_

		-		
	Absolute	Dominant I	Indicator	Dominance Test worksheet:
<u>Tree Stratum</u> (Plot size. <u>concert</u> )		<u>Species</u>	Status	Number of Dominant Species
1. Fagus grandilolia	00		FACU	That Are OBL, FACW, or FAC: $0$ (A)
2. Carya alba	40	Yes	UPL	Total Number of Dominant
<sub>3.</sub> Liriodendron tulipifera	20	No	FACU	Species Across All Strata: <u>3</u> (B)
4.				
5				Percent of Dominant Species
°				That Are OBL, FACW, of FAC: (A/B)
0				Prevalence Index worksheet:
7		·		Total % Cover of Multiply by
8				
	120	= Total Cove	er	OBL species X 1 =
Sapling/Shrub Stratum (Plot size: 30 feet )				FACW species x 2 =
<sub>1.</sub> Fagus grandifolia	30	Yes	FACU	FAC species x 3 =
<sub>2.</sub> Ilex opaca	2	No	FACU	FACU species x 4 =
3				UPL species x 5 =
				$\begin{array}{c} c = c + c + c + c + c + c + c + c + c +$
4		·		
5		·		Prevalence Index = B/A =
6				
7				Hydrophytic vegetation indicators:
8				1 - Rapid Test for Hydrophytic Vegetation
0				2 - Dominance Test is >50%
9				3 - Prevalence Index is ≤3.0 <sup>1</sup>
10		·		4 - Morphological Adaptations <sup>1</sup> (Provide supporting
15 foot	32	= Total Cove	er	dete in Remarka er en e senerate sheet)
Herb Stratum (Plot size: 15 leet )				
1. Polystichum acrostichoides	2	No	FACU	Problematic Hydrophytic Vegetation' (Explain)
<sub>2.</sub> Fagus grandifolia	2	No	FACU	
3.				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
а. Л				be present, unless disturbed or problematic.
+				Definitions of Four Vegetation Strata:
5		·		
6				<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or
7				height
8				noight.
9				Sapling/Shrub – Woody plants, excluding vines, less
10				than 3 in. DBH and greater than or equal to 3.28 ft (1
10:		·		m) tall.
11		·		Herb – All herbaceous (non-woody) plants, regardless
12				of size, and woody plants less than 3.28 ft tall.
<b>20</b> ( )	4	= Total Cove	er	
Woody Vine Stratum (Plot size: 30 feet )				<b>Woody vine</b> – All woody vines greater than 3.28 ft in
1				neight.
2.				
3				
4				
4				Hydrophytic
5		·		Vegetation
6				Present? Yes No X
	0	= Total Cove	er	
Descentes (lactude shots such as how as a second	al a at )			
Remarks: (Include photo numbers here or on a separate	sneet.)			

Depth Matrix Redox Features	
(inches) Color (moist) % Color (moist) % Type <sup>1</sup> Loc <sup>2</sup> Texture Remarks	
0-5 10YR 4/3 100 clay loam	
5-10         2.5Y 4/2         100         clay         pebbles	
10-13 2.5Y 5/2 85 10YR 5/4 15 C M sandy clay	
· · · · · · · · · · · · · · · · · · · · · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ · _ = ^ - \cdots _ · · · · · _ = ^ - \cdots · · · · · · · · · · · · · · · · · ~ ~ \cdots ·  · ~ ~ = \cdots = \cdots  = \cdots = \cdots	
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Location: PL=Pore Lining, M=Matrix.	3.
Histocol (A1) Dark Surface (S7) 2 cm Muck (A10) (MI PA 147)	
Histosof (AT) Dark Surface (S7) 2 cm muck (AT0) (MILRA 147)	
Black Histic (A3) Thin Dark Surface (S9) (MLRA 147, 148) (MLRA 147, 148)	
Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Piedmont Floodplain Soils (F19)	
Stratified Layers (A5) Depleted Matrix (F3) (MLRA 136, 147)	
2 cm Muck (A10) (LRR N) Redox Dark Surface (F6) Very Shallow Dark Surface (TF12)	
Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) Other (Explain in Remarks)	
Thick Dark Surface (A12) Redox Depressions (F8)	
Sandy Mucky Mineral (S1) (LRR N, Iron-Manganese Masses (F12) (LRR N,	
MLRA 147, 148) MLRA 136) Sandy Glaved Matrix (S4) Limbric Surface (E12) (MLDA 136, 122) <sup>3</sup> Indicators of hydrophytic vegetation at	d
Sandy Bedox (S5) Orible Surface (F13) (MLRA 130, 122) Indicators of hydrophytic vegetation at Sandy Bedox (S5) Piedmont Floodplain Soils (F19) (MLRA 148) wetland bydrology must be present	iu
Stripped Matrix (S6) Red Parent Material (F21) (MLRA 127, 147) unless disturbed or problematic.	
Restrictive Layer (if observed):	
Type:	
Depth (inches): Hydric Soil Present? Yes No	<

Attachment 11 Page 143 of 185

#### WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Winding Creek	City/County: Stafford County Sampling Date: March 21, 2014
Applicant/Owner: Winding Creek Owner, LLC	State: Virginia Sampling Point: DP-UPL3
Investigator(s): S. Gagnon & J. Muller	Section, Township, Range:
Landform (hillslope, terrace, etc.): Topographic Feature	Local relief (concave, convex, none): Concave Slope (%): 18%
Subregion (LRR or MLRA): LRR P Lat: 6850798	.4596 Long: 11783255.8722 Datum: NAD83
Soil Map Unit Name: Ce, Cartecay fine sandy loam	NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time	of year? Yes X No (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology signific	antly disturbed? Are "Normal Circumstances" present? Yes <u>×</u> No
Are Vegetation, Soil, or Hydrology natural	y problematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map show	ving sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present?       Yes       No       No <th>Is the Sampled Area       within a Wetland?       Yes       No       X       topographic feature in the northern portion of the       n F).</th>	Is the Sampled Area       within a Wetland?       Yes       No       X       topographic feature in the northern portion of the       n F).
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is required: check all that an	Surface Soil Cracks (B6)
<ul> <li>Surface Water (A1)</li> <li>High Water Table (A2)</li> <li>High Water Table (A2)</li> <li>Hydrogen</li> <li>Saturation (A3)</li> <li>Oxidized F</li> <li>Water Marks (B1)</li> <li>Presence F</li> <li>Sediment Deposits (B2)</li> <li>Recent Iro</li> <li>Drift Deposits (B3)</li> <li>Thin Muck</li> <li>Algal Mat or Crust (B4)</li> <li>Other (Exp</li> <li>Iron Deposits (B5)</li> <li>Inundation Visible on Aerial Imagery (B7)</li> <li>Water-Stained Leaves (B9)</li> <li>Aquatic Fauna (B13)</li> </ul>	Lic Plants (B14)       Sparsely Vegetated Concave Surface (B8)         Sulfide Odor (C1)       Drainage Patterns (B10)         thizospheres on Living Roots (C3)       Moss Trim Lines (B16)         of Reduced Iron (C4)       Dry-Season Water Table (C2)         n Reduction in Tilled Soils (C6)       Crayfish Burrows (C8)         Surface (C7)       Saturation Visible on Aerial Imagery (C9)         blain in Remarks)       Stunted or Stressed Plants (D1)         Geomorphic Position (D2)       Shallow Aquitard (D3)         Microtopographic Relief (D4)       FAC-Neutral Test (D5)
Surface Water Present? Yes No X Depth (in)	ches):
Water Table Present? Yes No X Depth (inc	ches):
Saturation Present? Yes X No Depth (includes capillary fringe)	ches): 8 inches Wetland Hydrology Present? Yes X No
Describe Recorded Data (stream gauge, monitoring well, aerial	photos, previous inspections), if available:
Pomorko	
Incinality.	

Attachment 11 Page 144 of 185

## **VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: DP-UPL3

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 feet )	% Cover	Species?	Status	Number of Dominant Species
1. Liriodendron tulipifera	60	Yes	FACU	That Are OBL, FACW, or FAC: $0$ (A)
2 Fagus grandifolia	50	Yes	FACU	
2. <u>Vvssa svlvatica</u>	10	No	FAC	Total Number of Dominant
3 <u></u>				Species Across All Strata: (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 0% (A/B)
6				Describer on Index workshoets
7				Prevalence index worksneet:
8.				Total % Cover of:Multiply by:
	120	= Total Cov	er	OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 30 feet )				FACW species x 2 =
1. Fagus grandifolia	40	Yes	FACU	FAC species x 3 =
2				FACU species x 4 =
2				
ა		·		
4				Column lotais: (A) (B)
5				Prevalence Index $- B/A -$
6				
7				Hydrophytic vegetation indicators:
8.				1 - Rapid Test for Hydrophytic Vegetation
8				2 - Dominance Test is >50%
9				3 - Prevalence Index is ≤3.0 <sup>1</sup>
10	40			4 - Morphological Adaptations <sup>1</sup> (Provide supporting
Horb Strotum (Plot oize: 15 feet	40	= Total Cov	er	data in Remarks or on a separate sheet)
<u>Held Stratum</u> (Flot Size. <u>10.000</u> )	2	Voc	EACU	Broblomatia Hydrophytia Vagatatian <sup>1</sup> (Evaluin)
1. Polystichum acrostichoides		165	FACU	
2. Fagus granditolia	5	Yes	FACU	
3				Indicators of hydric soil and wetland hydrology must
4				be present, unless disturbed or problematic.
5.				Definitions of Four Vegetation Strata:
				<b>Tree</b> – Woody plants, excluding vines, 3 in, (7.6 cm) or
0				more in diameter at breast height (DBH), regardless of
-		· · · · · · · · · · · · · · · · · · ·		height.
8				Conting (Chrysh - Weach, plants, such diagoning a lass
9				than 3 in DBH and greater than or equal to 3.28 ft (1
10				m) tall.
11				
12.				<b>Herb</b> – All herbaceous (non-woody) plants, regardless
	7	- Total Cov	or	or size, and woody plants less than 3.26 it tall.
Woody Vine Stratum (Plot size: 30 feet )		- 101ai 000	CI	Woody vine – All woody vines greater than 3.28 ft in
1				height.
0		·		
2		·		
3		·		
4		. <u> </u>		
5				Hydropnytic Vegetation
6				Present? Yes No X
	0	= Total Cov	er	
			-	
Remarks: (Include photo numbers here or on a separate	sneet.)			

Profile Desc	ription: (Describe	to the de	pth needed to docu	ment the i	ndicator	or confirm	n the absence	of indicato	ors.)		
Depth	Matrix		Redo	ox Feature	S						
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture		Remarks		
0-5	10YR 3/2	100					sandy clay loam				
5-8	2.5Y 5/2	98	10YR 5/8	2	С	Μ	sandy clay				
8-12	2.5Y 5/3	100					sandy clay				
·											
							·				
		·									
<sup>1</sup> Turney 0, 0		lation DM		C Maalua			<sup>2</sup> Lesstiant DI	Dana Linin	e M. Matrice		
Hydric Soil	Indicators	lietion, Riv	I=Reduced Matrix, M	S=IVIASKed	Sand Gra	ains.	Location: PL	etors for Pr	oblematic H	vdric Sc	oils <sup>3</sup> .
Histosol	(A1)		Dark Surface	e (S7)			2	cm Muck (A	(MI RA	147)	
Histic Er	pipedon (A2)		Polvvalue B	elow Surfa	ce (S8) <b>(N</b>	ILRA 147.	148) C	oast Prairie	Redox (A16	)	
Black Hi	stic (A3)		Thin Dark S	urface (S9	) (MLRA 1	47, 148)		(MLRA 14	7, 148)	,	
Hydroge	n Sulfide (A4)		Loamy Gley	ed Matrix (	F2)		P	iedmont Flo	odplain Soils	s (F19)	
Stratified	d Layers (A5)		Depleted Ma	atrix (F3)				(MLRA 13	6, 147)		
2 cm Mu	ick (A10) (LRR N)		Redox Dark	Surface (F	6)		V	ery Shallow	Dark Surfac	e (TF12)	
Depleted	d Below Dark Surfac	e (A11)	Depleted Da	irk Surface	: (F7) 2)		0	ther (Explai	n in Remark	3)	
Thick Da	ark Sullace (A12) Aucky Mineral (S1) <b>(I</b>	RRN	Redux Depi	LSSIUIS (F	0) 65 (F12) <b>(</b>						
Oundy N	<b>147. 148</b> )	,	MLRA 13	36)	00 (1 12) (	,					
Sandy G	leyed Matrix (S4)		Umbric Surfa	ace (F13) (	MLRA 13	6, 122)	<sup>3</sup> Ind	icators of hy	/drophytic ve	getation	and
Sandy R	edox (S5)		Piedmont Fl	oodplain S	oils (F19)	(MLRA 14	48) wetland hydrology must be present,				
Stripped	Matrix (S6)		Red Parent	Material (F	21) <b>(MLR</b>	A 127, 147	<b>7)</b> unl	ess disturbe	ed or problen	natic.	
Restrictive I	_ayer (if observed):	:									
Type:											
Depth (ind	ches):						Hydric Soil	Present?	Yes	_ No_	×
Remarks:											

Attachment 11 Page 146 of 185

### WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Winding Creek	City/County: Stafford County	Sampling Date: March 21, 2014
Applicant/Owner: Winding Creek Owner, LLC	S	tate: Virginia Sampling Point: DP-UPL4
Investigator(s): S. Gagnon & J. Muller	Section, Township, Range:	
Landform (hillslope, terrace, etc.): Drainage Feature	Local relief (concave, convex, none):	Concave Slope (%): 4%
Subregion (LRR or MLRA): LRR P Lat: 6845	9654.7056 Long: 117829	084.7234 Datum: NAD83
Soil Map Unit Name: OrB, Orange loam, 2 to 6 percent	slopes	NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this	time of year? Yes X No (If no	o, explain in Remarks.)
Are Vegetation, Soil, or Hydrology sig	gnificantly disturbed? Are "Normal Circ	cumstances" present? Yes 🗙 No
Are Vegetation, Soil, or Hydrology na	turally problematic? (If needed, expla	ain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map s	howing sampling point locations	, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No	X Is the Sampled Area	
Hydric Soil Present? Yes No	within a Wetland?	Yes No X
Wetland Hydrology Present? Yes X No		
Remarks:		
Data Point DP-UPL4 was collected withi	in a topographic feature in the	western portion of the
Property.		

### HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
	<ul> <li>Sparsely Vegetated Concave Surface (B8)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Dry-Season Water Table (C2)</li> <li>Crayfish Burrows (C8)</li> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>Microtopographic Relief (D4)</li> <li>FAC-Neutral Test (D5)</li> </ul>
Field Observations:	
Surface Water Present? Yes No X Depth (inches):	
Water Table Present? Yes X No Depth (inches): < 1 inch	
Saturation Present? Yes X No Depth (inches): < 1 inch Wetlan (includes capillary fringe)	d Hydrology Present? Yes X No
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if a	available:
Remarks:	

Attachment 11 Page 147 of 185

# **VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: DP-UPL4

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 feet )	% Cover	Species?	Status	Numbers (Descional Operator
1 Liquidambarv stvraciflua	40	Yes	FAC	Number of Dominant Species That Are OBLEACW or EAC: $3$ (A)
2 Liriodendron tulipifera	40	Yes	FACU	
2. Acer rubrum	30	Yes	FAC	Total Number of Dominant
<u></u>				Species Across All Strata: (B)
4		·	·	Percent of Dominant Species
5	·	·		That Are OBL, FACW, or FAC: (A/B)
6		·	·	Prevalence Index worksheet:
7	·	·		Total % Cover of: Multiply by:
8		·		OBL species x1 -
Quality (Qharth Quartury (Dhat size 30 feet	110	= Total Cov	er	
Sapling/Shrub Stratum (Plot size:	10	Vec	FACU	
1. Tagus grandilolla	2	No		FAC species X 3 =
2. Fraxinus perinsylvanica	2		FACW	FACU species x 4 =
3. Liquidambar styraciliua	10	res	FAC	UPL species x 5 =
4. Vaccinium corymbosum	10	Yes	FACW	Column Totals: (A) (B)
<sub>5.</sub> Ilex opaca	2	No	FACU	Provolonce Index - R/A -
6				
7				Hydrophytic vegetation indicators:
8				1 - Rapid Test for Hydrophytic Vegetation
9.				2 - Dominance Test is >50%
10.				3 - Prevalence Index is ≤3.01
	34	= Total Cov	er.	4 - Morphological Adaptations <sup>1</sup> (Provide supporting
Herb Stratum (Plot size: 15 feet )		- 10101 001		data in Remarks or on a separate sheet)
<sub>1.</sub> Ilex opaca	5	Yes	FACU	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
2. Vaccinium corymbosum	2	No	FACW	
3. Polystichum acrostichoides	10	Yes	FACU	<sup>1</sup> Indicators of hydric soil and wetland hydrology must
△ Smilax rotundifolia	2	No	FAC	be present, unless disturbed or problematic.
5				Definitions of Four Vegetation Strata:
5	·	·		<b>Tree</b> Weady plants, avaluding vince, 2 in (7.6 cm) or
0		·		more in diameter at breast height (DBH), regardless of
<i>1</i>	·	·		height.
8	·	·		Sanling/Shrub – Woody plants, excluding vines, less
9				than 3 in. DBH and greater than or equal to 3.28 ft (1
10	·	·		m) tall.
11	·	·		Herb - All herbaceous (non-woody) plants, regardless
12		. <u> </u>		of size, and woody plants less than 3.28 ft tall.
20 foot	19	= Total Cov	er	
Woody Vine Stratum (Plot size: <u>30 leet</u> )				Woody vine – All woody vines greater than 3.28 ft in height
1	·	·		- Toight.
2			·	
3	·	. <u> </u>		
4		. <u> </u>		
5				Hydrophytic Vegetation
6				Present? Yes No X
	0	= Total Cov	er	
Remarks: (Include photo numbers here or on a separate	sheet )			
	shoot.)			

	Matrix		Red	ox Feature	25		
inches)	Color (moist)	%	Color (moist)	<u>%</u>	Type <sup>1</sup>	Loc <sup>2</sup>	Texture Remarks
0-10	2.5Y 5/3	75	7.5YR 4/6	25	С	Μ	clay
0-14	2.5Y 5/3	65	5YR 4/6	35	С	Μ	clay loam
						·	
				·	·	·	
					. <u> </u>	·	
				<u></u>			
				IS=Maske	d Sand Gr	ains	<sup>2</sup> Location: PL=Pore Lining M=Matrix
vdric Soil	Indicators:					umo.	Indicators for Problematic Hydric Soils
_ Histosol _ Histic Ep Black Hi	(A1) Dipedon (A2)		Dark Surfac Polyvalue B Thin Dark S	e (S7) elow Surfa	ace (S8) <b>(N</b>	/ILRA 147	2 cm Muck (A10) (MLRA 147) 7, 148) Coast Prairie Redox (A16) (MLRA 147, 148)
Hydroge	n Sulfide (A4)		Loamy Gley	ed Matrix	(F2)	147, 140)	Piedmont Floodplain Soils (F19)
_ Stratified	d Layers (A5)		Depleted Ma	atrix (F3) Surface (	E6)		(MLRA 136, 147) Very Shallow Dark Surface (TE12)
_ 2 cm with Depleted	d Below Dark Surfa	ce (A11)	Depleted Da	ark Surface	e (F7)		Other (Explain in Remarks)
Thick Da	ark Surface (A12)		Redox Depr	essions (F	-8)		<u> </u>
Sandy M	lucky Mineral (S1)	(LRR N,	Iron-Manga	nese Mass	ses (F12) <b>(</b>	LRR N,	
MLRA	A 147, 148)		MLRA 1	36)			
_ Sandy G	eleyed Matrix (S4)		Umbric Surf	ace (F13)	(MLRA 13	86, 122)	<sup>3</sup> Indicators of hydrophytic vegetation ar
_ Sandy R	edox (S5)		Piedmont Fl	oodplain \$	Soils (F19)	(MLRA 1	<b>148)</b> wetland hydrology must be present,
_ Stripped	Matrix (S6)	-	Red Parent	Material (	F21) <b>(MLR</b>	A 127, 14	47) unless disturbed or problematic.
estrictive I	_ayer (if observed	l):					
Туре:							
Depth (ind	ches):						Hydric Soil Present? Yes No _>
a second s							
Attachment 11 Page 149 of 185

### WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Winding Creek	City/Co	unty: Stafford Count	y	Sampling Date: March 24, 2014
Applicant/Owner: Winding Creek Owner, LLC			_ <sub>State:</sub> Virginia	Sampling Point: DP-UPL5
Investigator(s): S. Gagnon & J. Muller	Section	n, Township, Range:		
Landform (hillslope, terrace, etc.): Topographic featu	re Local relief	f (concave, convex, no	ne): Concave	Slope (%): <u>3%</u>
Subregion (LRR or MLRA): LRR P Lat:	6850415.8261	Long: 117	83099.5330	Datum: NAD83
Soil Map Unit Name: AsD, Ashlar fine sandy loam,	6 to 15 percent slop	bes	NWI classifica	ation: N/A
Are climatic / hydrologic conditions on the site typical for	this time of year? Yes	s_X_No	(If no, explain in Re	emarks.)
Are Vegetation, Soil, or Hydrology		ed? Are "Norma	I Circumstances" p	resent? Yes 🗙 No
Are Vegetation, Soil, or Hydrology	naturally problemati	ic? (If needed, e	explain any answer	's in Remarks.)
SUMMARY OF FINDINGS – Attach site ma	ap showing samp	oling point location	ons, transects,	, important features, etc.
Hydrophytic Vegetation Present?       Yes         Hydric Soil Present?       Yes         Wetland Hydrology Present?       Yes         Remarks:       Data Point DP-UPL5 was collected with the Property and adjacent to Winding	vithin a topogra	Is the Sampled Area within a Wetland? phic feature wit	Yes	× western portion of
HYDROLOGY				
Wetland Hydrology Indicators:			Secondary Indicat	tors (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)			Surface Soil (	Cracks (B6)
Surface Water (A1) True Aquatic Plants (B14)			Sparsely Veg	etated Concave Surface (B8)
High Water Table (A2) Hydrogen Sulfide Odor (C1)			Drainage Pat	terns (B10)
Saturation (A3)	Dxidized Rhizospheres	s on Living Roots (C3)	Moss Trim Li	nes (B16)
Water Marks (B1)	Presence of Reduced I	Iron (C4)	Dry-Season V	Vater Table (C2)
Sediment Deposits (B2)	Recent Iron Reduction	in Tilled Soils (C6)	Crayfish Burr	ows (C8)
	(b) b n l) old thurstoon (C)		L'aturation 1/i.	

Thin Muck Surface (C7) Other (Explain in Remarks)	<ul> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>Microtopographic Relief (D4)</li> <li>FAC-Neutral Test (D5)</li> </ul>
X Depth (inches):	
X Depth (inches):	
X Depth (inches):	Wetland Hydrology Present? Yes No X
ring well, aerial photos, previous inspec	tions), if available:
	Thin Muck Surface (C7)     Other (Explain in Remarks)      Depth (inches):     Depth (inches):     Depth (inches):     Tring well, aerial photos, previous inspect

Attachment 11 Page 150 of 185

### **VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: DP-UPL5

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 feet )	% Cover	Species?	Status	Number of Dominant Species
<sub>1.</sub> Fagus grandifolia	50	Yes	FACU	That Are OBL FACW or FAC: $0$ (A)
2 Quercus rubra	40	Yes	FACU	
o Quercus alba	50	Yes	FACU	Total Number of Dominant
<u>3. Quorodo dibu</u>	20	<u>No</u>		Species Across All Strata: <u>5</u> (B)
4. Carya alba	20			Percent of Dominant Species
5. Liriodendron tulipitera	10	NO	FACU	That Are OBL, FACW, or FAC: 0% (A/B)
6				
7				Prevalence Index worksheet:
8.				Total % Cover of: Multiply by:
	170	= Total Cov	er	OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 30 feet )				FACW species x 2 =
1. Ilex opaca	2	No	FACU	FAC species x 3 =
2 Fagus grandifolia	30	Yes	FACU	FACU species x 4 =
2	·			
ა	·			
4	·			Column Totals: (A) (B)
5				Provalance Index - R/A -
6				
7.				Hydrophytic Vegetation Indicators:
8				1 - Rapid Test for Hydrophytic Vegetation
0				2 - Dominance Test is >50%
9				3 - Prevalence Index is ≤3.0 <sup>1</sup>
10				4 - Morphological Adaptations <sup>1</sup> (Provide supporting
Unit Obstance (Distained 15 feet	32	= Total Cov	er	data in Remarks or on a senarate sheet)
Herb Stratum (Plot size: 10 leet )	20	Vaa	FACU	Drahlamatia Lludraphytic Manatatian <sup>1</sup> (Furlain)
1. Fagus grandifolia	20	res	FACU	
2				
3				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
4.				be present, unless disturbed or problematic.
5				Definitions of Four Vegetation Strata:
o				Tree Woody plants excluding vines 2 in (7.6 cm) or
0				more in diameter at breast height (DBH), regardless of
7				height.
8	·			
9				<b>Sapling/Shrub</b> – Woody plants, excluding vines, less
10				m) tall.
11.				
12				Herb – All herbaceous (non-woody) plants, regardless
	20	Total Cau		of size, and woody plants less than 3.28 ft tall.
Woody Vine Stratum (Plot size: 30 feet )			ei	Woody vine – All woody vines greater than 3.28 ft in
1				height.
1	·			
۷	·			
3	·			
4	·			
5				Hydrophytic
6.				Present? Yes No X
	0	= Total Cov	er	
<b>D</b>				
Remarks: (Include photo numbers here or on a separate s	sheet.)			

Color (moist)       %       Color (moist)       %       Type <sup>1</sup> Loc <sup>2</sup> Texture       Remarks         0-6       2.5Y 4/4       98       10YR 4/6       2       C       M       clay       pebbles         6-12       2.5Y 5/4       85       10YR 3/2       10       C       M       clay       pebbles         2.5Y 6/3       5       D       M       clay       pebbles       clay       pebbles         2.5Y 6/3       5       D       M       clay       pebbles       clay       pebbles         2.5Y 6/3       5       D       M       clay       clay       clay       clay       clay       pebbles         2.5Y 6/3       5       D       M       clay       cla	
-6       2.5Y 4/4       98       10YR 4/6       2       C       M       clay         2.5Y 5/4       85       10YR 3/2       10       C       M       clay       pebbles         2.5Y 6/3       5       D       M	
-12       2.5Y 5/4       85       10YR 3/2       10       C       M       clay       pebbles         2.5Y 6/3       5       D       M	
2.5Y 6/3       5       D       M	
ype: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup> Location: PL=Pore Lining, M=Matrix.         ydric Soil Indicators:       Indicators for Problematic Hydr	
ype:       C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup> Location:       PL=Pore Lining, M=Matrix.         ydric Soil Indicators:       Indicators for Problematic Hydr	
ype: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup> Location: PL=Pore Lining, M=Matrix.         rdric Soil Indicators:       Indicators for Problematic Hydr         - Histosol (A1)       Dark Surface (S7)       2 cm Muck (A10) (MLRA 147, 148)         - Histic Epipedon (A2)       Polyvalue Below Surface (S8) (MLRA 147, 148)       Coast Prairie Redox (A16)         - Black Histic (A3)       Thin Dark Surface (S9) (MLRA 147, 148)       Coast Prairie Redox (A16)         - Hydrogen Sulfide (A4)       Loamy Gleyed Matrix (F2)       Piedmont Floodplain Soils (F1         - Stratified Layers (A5)       Depleted Matrix (F3)       MLRA 136, 147)         - 2 cm Muck (A10) (LRR N)       Redox Dark Surface (F6)       Very Shallow Dark Surface (T         - Depleted Below Dark Surface (A11)       Depleted Dark Surface (F7)       Other (Explain in Remarks)         - Thick Dark Surface (A12)       Redox Depressions (F8)       Other (Explain in Remarks)         - Sandy Mucky Mineral (S1) (LRR N, MLRA 136)       Umbric Surface (F13) (MLRA 136, 122) <sup>3</sup> Indicators of hydrophytic vegeta         - Sandy Redox (S5)       Umbric Surface (F13) (MLRA 136, 122)       Sindicators of hydrophytic vegeta	
ype: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup> Location: PL=Pore Lining, M=Matrix.         rdric Soil Indicators:       Indicators for Problematic Hydr	
ype:       C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup> Location:       PL=Pore Lining, M=Matrix.         rdric Soil Indicators:       Indicators for Problematic Hydr         - Histosol (A1)        Dark Surface (S7)        2 cm Muck (A10) (MLRA 147)         - Histic Epipedon (A2)        Polyvalue Below Surface (S8) (MLRA 147, 148)        Coast Prairie Redox (A16)	
ype:       C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup> Location:       PL=Pore Lining, M=Matrix.         rdric Soil Indicators:       Indicators for Problematic Hydr	
ype: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup> Location: PL=Pore Lining, M=Matrix.         ydric Soil Indicators:       Indicators for Problematic Hydri         _ Histosol (A1)       _ Dark Surface (S7)       _ 2 cm Muck (A10) (MLRA 147, 148)         _ Histic Epipedon (A2)       _ Polyvalue Below Surface (S9) (MLRA 147, 148)       _ Coast Prairie Redox (A16)         _ Black Histic (A3)       _ Thin Dark Surface (S9) (MLRA 147, 148)       _ Coast Prairie Redox (A16)         _ Hydrogen Sulfide (A4)       _ Loamy Gleyed Matrix (F2)       _ Piedmont Floodplain Soils (F1         _ Stratified Layers (A5)       _ Depleted Matrix (F3)       (MLRA 136, 147)         _ Depleted Below Dark Surface (A11)       _ Depleted Dark Surface (F7)       _ Other (Explain in Remarks)         _ Thick Dark Surface (A12)       _ Redox Depressions (F8)       _ Other (Explain in Remarks)         _ Sandy Mucky Mineral (S1) (LRR N,       _ Iron-Manganese Masses (F12) (LRR N,       _ Allcators of hydrophytic vegeta         _ Sandy Gleyed Matrix (S4)       _ Umbric Surface (F13) (MLRA 136, 122)       _ Allcators of hydrophytic vegeta         _ Sandy Redox (S5)       _ Umbric Surface (F13) (MLRA 148)       _ Allcators of hydrophytic vegeta	
ydric Soil Indicators:       Indicators for Problematic Hydr         _ Histosol (A1)       _ Dark Surface (S7)       _ 2 cm Muck (A10) (MLRA 147)         _ Histic Epipedon (A2)       _ Polyvalue Below Surface (S8) (MLRA 147, 148)       _ Coast Prairie Redox (A16)         _ Black Histic (A3)       _ Thin Dark Surface (S9) (MLRA 147, 148)       _ Coast Prairie Redox (A16)         _ Hydrogen Sulfide (A4)       _ Loamy Gleyed Matrix (F2)       _ Piedmont Floodplain Soils (F1         _ Stratified Layers (A5)       _ Depleted Matrix (F3)       (MLRA 136, 147)         _ Depleted Below Dark Surface (A11)       _ Redox Dark Surface (F6)       _ Very Shallow Dark Surface (T         _ Thick Dark Surface (A12)       _ Redox Depressions (F8)       _ Other (Explain in Remarks)         _ Sandy Mucky Mineral (S1) (LRR N,       _ Iron-Manganese Masses (F12) (LRR N,       _ MLRA 136,         _ Sandy Bedox (S5)       _ Umbric Surface (F13) (MLRA 136, 122)       _ Indicators of hydrophytic vegetar	
Stripped Matrix (S6) Red Parent Material (F21) (MLRA 127, 147) unless disturbed or problematic	I9) 'F12) ation and sent, c.
Type:	
Deptn (inches): Hydric Soil Present? Yes	

Wetland Delineation Report

Appendix G

**Photographs** 



**Photo #1:** View to the southeast within a maintained utility easement that transects the southeastern portion of the Property (March 24, 2014, by S. Gagnon, BCG).



**Photo #2:** View to the southwest of Data Point DP-A3, which was collected just upslope of Wetland A near Flags A1/A2. This area exhibited wetland hydrology, but does not exhibit hydric soils or support hydrophytic vegetation (April 2, 2014, by J. Fleming, BCG).



**Photo #3:** View to the northeast of Data Point DP-A1, which was collected just upslope of Wetland A near Flags A1/A2 and within a cleared corridor that parallels Wetland A. This area does not exhibit any of the three wetland parameters (March 21, 2014, by S. Gagnon, BCG).



**Photo #4:** Downslope view of Data Point DP-A2, which was collected within Wetland A between Flags A1/A2 and A3/A4 (March 21, 2014, by S. Gagnon, BCG).



**Photo #5:** Downstream view of Wetland A as it transitions to an intermittent stream near Flags A7/A8 (March 21, 2014, by S. Gagnon, BCG).



**Photo #6:** Downstream view of Stream A from near Flags A29/A30, where the channel transitions to perennial flow at a headcut just upstream of the confluence with Stream C (April 2, 2014, by J. Fleming, BCG).



**Photo #7:** Upslope view within a topographic feature in the southeastern portion of the Property. No jurisdictional areas were identified within this feature (March 21, 2014, by S. Gagnon, BCG).



**Photo #8:** View to the southeast of Data Point DP-B2, which was collected just upslope of Wetland B near Flags B1/B2. This area does not support any of the three wetland parameters (March 21, 2014, by S. Gagnon, BCG).



**Photo #9:** Downslope view of Data Point DP-B1, which was collected within Wetland B near Flags B7/B8 (March 21, 2014, by S. Gagnon, BCG).



**Photo #10:** Downslope view of Data Point DP-B3, which was collected within an upland area between Wetland B and Wetland C. This area does not support any of the three wetland parameters (March 21, 2014, by S. Gagnon, BCG).



**Photo #11:** Upslope view of Data Point DP-C1, which was collected within Wetland C near Flags C5/C6 (March 21, 2014, by S. Gagnon, BCG).



**Photo #12:** Downstream view of Wetland C as it transitions to an intermittent stream at a headcut near Flags C9/C10 (March 21, 2014, by S. Gagnon, BCG).



**Photo #13:** Upstream view of the convergence of Stream C with Stream A near Flags C15/C16 and A33/A34 (March 21, 2014, by S. Gagnon, BCG).



**Photo #14:** Downstream view of Stream A as it flows offsite to the northeast near Flags A45/A46 (March 21, 2014, by S. Gagnon, BCG).



**Photo #15:** View to the southeast of Data Point DP-D2, which was collected just upslope of Wetland D near Flags D1/D2. This area does not support any of the three wetland parameters (March 21, 2014, by S. Gagnon, BCG).



**Photo #16:** Upslope view of Data Point DP-D1, which was collected within Wetland D near Flags D3/D4 (March 21, 2014, by S. Gagnon, BCG).



**Photo #17:** Downslope view of Data Point DP-UPL1, which was collected within a topographic feature just upslope of Wetland D. This area exhibited wetland hydrology, but does not support hydrophytic vegetation or exhibit hydric soils or a defined stream channel (March 21, 2014, by S. Gagnon, BCG).



**Photo #18:** Upstream view of Wetland D as it transitions to an intermittent stream at a headcut near Flags D11/D16 (March 21, 2014, by S. Gagnon, BCG).



**Photo #19:** Downstream view of Stream D from near Flags D15/D20 (March 21, 2014, by S. Gagnon, BCG).



**Photo #20:** View to the west within a topographic feature located just upslope of Stream D near Flag D27. No jurisdictional areas were identified within this feature (March 21, 2014, by S. Gagnon, BCG).



**Photo #21:** Downstream view of Stream D from near Flags D33/D38, as it continues offsite to the northeast (March 21, 2014, by S. Gagnon, BCG).



**Photo #22:** View to the northwest of Data Point DP-E1, which was collected just upslope of Wetland E near Flags E1/E2. This area exhibits hydric soils, but does not support hydrophytic vegetation, or exhibit wetland hydrology or a defined stream channel (March 21, 2014, by S. Gagnon, BCG).



**Photo #23:** Downslope view of Data Point DP-E2, which was collected within Wetland E near Flags E1/E2 (March 21, 2014, by S. Gagnon, BCG).



**Photo #24:** Upslope view within Wetland E from Flags E7/E8 as it continues offsite to the northeast (March 21, 2014, by S. Gagnon, BCG).



**Photo #25:** Downslope view of Data Point DP-UPL5, which was collected within a topographic feature in the northwestern portion of the Property near Winding Creek Road. This area does not support any of the three wetland parameters (March 24, 2014, 2013, by S. Gagnon, BCG).



**Photo #26:** Downslope view of Data Point DP-UPL3, which was collected within a topographic feature just upslope of Austin Run (Stream F). This area exhibits wetland hydrology, but does not support hydrophytic vegetation or exhibit hydric soils or a defined stream channel (March 21, 2014, by S. Gagnon, BCG).



**Photo #27:** Downslope view of Data Point DP-UPL2, which was collected within a topographic feature just upslope of Austin Run (Stream F). This area exhibits wetland hydrology, but does not support hydrophytic vegetation or exhibit hydric soils or a defined stream channel (March 21, 2014, by S. Gagnon, BCG).



**Photo #28:** Downstream view of Austin Run (Stream F) as it flows onto the Property near Flags F5/F6 (March 21, 2014, by S. Gagnon, BCG).



**Photo #29:** View to the southwest of Data Point DP-F1, which was collected within the floodplain of Austin Run near Flag F10. This area does not support any of the three wetland parameters (March 21, 2014, by S. Gagnon, BCG).



**Photo #30:** Downstream view of Austin Run (Stream F) from near Flags F11/F12 (March 21, 2014, by S. Gagnon, BCG).



**Photo #31:** Upstream view of Austin Run near where it flows outside of the Property at Flags F13/F14 (March 21, 2014, by S. Gagnon, BCG).



**Photo #32:** Downstream view of Stream H located offsite and north of the Property near Flags H1/H2 (March 24, 2014, by S. Gagnon, BCG).



**Photo #33:** Downstream view of Stream H near Flags H7/H8 and just within the Property limits (March 24, 2014, by S. Gagnon, BCG).



**Photo #34:** Upstream view of Stream H as it flows offsite and east of the Property through a maintained lawn area (March 24, 2014, by S. Gagnon, BCG).



**Photo #35:** Downstream view of Stream H at its convergence with Austin Run (Stream F) offsite near Flags F13/F14 (March 24, 2014, by S. Gagnon, BCG).



**Photo #36:** View to the north of Winding Creek Road, which transects the western portion of the Property from north to south (March 21, 2014, by S. Gagnon, BCG).



**Photo #37:** View to the southeast within a maintained utility easement that transects the southern portion of the Property (March 21, 2014, by S. Gagnon, BCG).



**Photo #38:** View to the northeast of Wetland G from near Flags G1/G2 (March 21, 2014, by S. Gagnon, BCG).



**Photo #39:** View to the northwest of Data Point DP-G3, which was collected within Wetland G near Flags G16/G18 (March 24, 2014, by S. Gagnon, BCG).



**Photo #40:** View to the east of Data Point DP-G2, which was collected just upslope of Wetland G near Flag G32. This area does not support any of the three wetland parameters (March 24, 2014, by S. Gagnon, BCG).



**Photo #41:** View to the south of Data Point DP-G1, which was collected within Wetland G near Flags G34/G36 and just offsite to the west of the Property (March 24, 2014, by S. Gagnon, BCG).



**Photo #42:** Upslope view of Data Point DP-UPL4, which was collected within a topographic feature in the western portion of the Property. This area exhibits wetland hydrology, but does not support hydrophytic vegetation or exhibit hydric soils (March 21, 2014, by S. Gagnon, BCG).

Wetland Delineation Report

Appendix H

General Project Information for a USACE Jurisdictional Determination

#### Wetland Delineation Report

## GENERAL PROJECT INFORMATION FOR A USACE JURISDICTIONAL DETERMINATION

- **Property Name:** Winding Creek
- Locality: Stafford County, Virginia

**Location:** 38°27'10"N latitude, -77°26'59"W longitude

- USGS Quadrangle: Stafford, VA
- HUC Code: PL57 (Lower Aquia Creek) 02070011 (Lower Potomac)
- **Tributaries:** Austin Run and UTs to Austin Run

#### **Applicant/Agent Information:**

#### **Applicant:**

Agent:

Winding Creek Owner, LLC 15256 Welton Court Centreville, Virginia 20120 Attn: Mr. Frank Lackman Phone: 703.463.1808 Bowman Consulting Group, Ltd. 14020 Thunderbolt Place, Suite 300 Chantilly, Virginia 20151 Attn: Ms. Jessica L. Fleming Phone: 703.464.1000 Fax: 703.481.9720

#### **Inventory of jurisdictional areas within the Property limits**<sup>1</sup>:

Classification <sup>2</sup>	Length (LF)	Area (SF)	Area (Ac)
Perennial Streams (R4)	466	N/A	N/A
Intermittent Streams (R4)	1,140	N/A	N/A
Palustrine Forested Wetlands (PFO)	N/A	27,004	0.62
Total Waters of the U.S.	1,606	27,004	0.62

 $^{T}$  The amount of waters of the U.S. and wetlands indicated in the table reflects the amount located within the Property boundaries.

<sup>2</sup> Stream classifications are based on field assessments by BCG in March and April, 2014 using the NCDWQ Stream Classification Method (Version 4.11, September 2010), as approved for use by Stafford County.





( IN FEET )

1 inch = 120 ft.

Map Unit	Map Unit Name	Drainage Class <sup>1</sup>	National Hydric Soils List <sup>2</sup>	Hy Comp
Ae	Alluvial land, wet	PD	Yes	Alluvial (85
AIB	Appling fine sandy loam, 2 to 6 percent slopes	WD	No	N
AIC2	Appling fine sandy loam, 6 to 15 percent slopes, eroded	WD	No	N
AsD	Ashlar fine sandy loam, 6 to 15 percent slopes	WD	No	N
BmB	Bourne fine sandy loam, 2 to 6 percent slopes	MWD	No	N
BmC2	Bourne fine sandy loam, 6 to 10 percent slopes, eroded	MWD	No	N
CaB2	Caroline fine sandy loam, 2 to 6 percent slopes, eroded	WD	No	N
CaC2	Caroline fine sandy loam, 6 to 10 percent slopes, eroded	WD	No	N
CaD2	Caroline fine sandy loam, 10 to 18 percent slopes, eroded	WD	No	N
CcD3	Caroline clay loam, 10 to 18 percent slopes, severely eroded	WD	No	N
Ce	Cartecay fine sandy loam	SPD	Yes	Carteca Alluvial lan Wehadl
OrB	Orange loam, 2 to 6 percent slopes	MWD	No	N
TeB	Tetotum fine sandy loam, 2 to 6 percent slopes	MWD	No	N

Data Point	Mapped Soil Unit	Hydrophytic Vegetation	Hydric Soils	Wetland Hydrology	
DP-A1	TeB	No	No	No	
DP-A2	TeB	Yes	Yes	Yes	
DP-A3	TeB	No	No	Yes	
DP-B1	TeB	Yes	Yes	Yes	
DP-B2	TeB	No	No	No	
DP-B3	TeB	No	No	No	
DP-C1	TeB	Yes	Yes	Yes	
DP-D1	CaC2	Yes	Yes	Yes	
DP-D2	CaC2	No	No	No	
DP-E1	Ae	No	Yes	No	
DP-E2	Ae	Yes	Yes	Yes	
DP-F1	Ce	No	No	No	U
DP-G1	OrB	Yes	Yes	Yes	
DP-G2	OrB	No	No	No	
DP-G3	OrB	Yes	Yes	Yes	
DP-UPL1	AlC2	No	No	Yes	
DP-UPL2	AsD	No	No	Yes	
DP-UPL3	Ce	No	No	Yes	
DP-UPL4	OrB	No	No	Yes	
DP-UPL5	AsD	No	No	No	

Applicable <sup>2</sup> Per National Hydric Soils List for Stafford and King George Counties, Virginia published by USDA Natural Resources Conservation Services

SHEET

OF

Attachment 11 Page 177 of 185



July 31, 2015

Mr. Frank Lackman Winding Creek, LLC 5919 Trail Ride Drive Moseley, Virginia 23120

## **RE:** Winding Creek (Musselman Property), Stafford County, Virginia Small Whorled Pogonia Survey

Dear Mr. Lackman:

Bowman Consulting Group, Ltd. (BCG) has completed a habitat assessment and field survey for small whorled pogonia (*Isotria medeoloides*) at the approximately 63.1-acre Winding Creek Project, which is identified as Tax Map 29, Parcels 4 and 5C, and located at 327 Winding Creek Road, approximately 0.6 mile north of its intersection with Courthouse Road in Stafford County, Virginia. The survey was conducted on July 9, 2015 by Mr. Philip Abell of BCG, who is on the U.S. Fish and Wildlife Service (USFWS) Virginia Field Office's list of qualified surveyors for this plant, and assisted by Mr. Sean Gagnon, also of BCG. The following letter details the habitat requirements for the small whorled pogonia, the methodology employed during the field survey, and the results of the survey, with Aerial Photograph and Existing Conditions Exhibits and representative site photographs attached.

As you are aware, BCG previously completed a habitat assessment and field survey for small whorled pogonia at the Project (formerly known as Musselman Property) in June/July 2013. Based on the results of that survey, no individuals or populations of the plant species were observed at the Project. Given that field surveys for this plant species are typically only valid for a period of two (2) years, a new field survey was warranted for the property.

The small whorled pogonia is an orchid that is a State-listed endangered and Federal-listed threatened plant species. This species is one of the rarest of the native orchids. The small whorled pogonia may lie dormant for as many as ten years before reappearing in a given location. Natural and man-made factors are both believed to influence this dormancy period. Natural factors include seasonal precipitation levels, long-term climatic variations, vertebrate and insect herbivory, and changes in the amount of sunlight penetrating the forest canopy as a result of natural causes, such as large trees blown down by storms. Man-made influences may include cutting down of trees in selective timber harvesting, use of the forest as pasture area, or the occasional traffic of off-road or farm vehicles through the area.

Habitat for the small whorled pogonia generally occurs in mature, deciduous upland forests having acidic soil and terrain that is gently to moderately sloping. Slope orientation is typically in northerly or easterly directions. Typical forest habitat consists of deciduous species in the canopy, with moderately open understory, relatively little groundcover, and sunlight patches on the forest floor. In general, areas with extensive or predominant stands of pine can be eliminated as potential habitat.

Letter to Mr. Frank Lackman, Winding Creek, LLC Winding Creek (Musselman Property), Stafford County, Virginia – Small Whorled Pogonia Survey July 31, 2015 Page 2 of 3

A preliminary evaluation of potential suitable habitat for small whorled pogonia at the Project was performed by BCG prior to the field investigation by examination of existing conditions and topographic mapping, aerial photography, and predictive habitat mapping for the species obtained from the Virginia Department of Conservation and Recreation's (DCR) Virginia Natural Heritage Data Explorer (VaNHDE) (*https://vanhde.org/*) (see attached exhibits), as well as the results of the 2013 field survey. The reference information was verified by a site inspection conducted by BCG on July 9, 2015 to evaluate whether the small whorled pogonia and/or potential suitable habitat for the species is present at the Project. Intensive searches were conducted in areas identified as predicted habitat for the small whorled pogonia on the DCR VaNHDE Predictive Model Exhibit, and those areas determined in the field to exhibit potential suitable habitat for the species. Transects were performed across areas of potential suitable habitat, and groundcover was carefully observed for the presence of small whorled pogonia.

The approximately 64.6-acre Winding Creek Project includes an existing residence along Winding Creek Road and mixed deciduous and coniferous forest, with Austin Run flowing through the northern portion as shown on the attached Aerial Photograph Exhibit. Major portions of the Project area are dominated by relatively young regrowth forest, which generally indicates past disturbance either from logging/timbering operations and/or agricultural uses such as crops or pasture land. These regrowth forested areas at the Project exhibit a relatively dense understory and groundcover, which is considered unsuitable habitat for the small whorled pogonia. Virginia pine (*Pinus virginiana*) is prevalent in many of the upland areas in the central portion and almost the entirety of the Project on the western side of Winding Creek Road. Virginia pine, which provides unsuitable habitat conditions for the small whorled pogonia, is a characteristic pioneer species and is typically indicative of a regrowth condition. The western portion of the Project area not dominated by Virginia pine between Winding Creek Road and the adjacent Berkshire community is characterized by young (2 to 6-inch DBH) regrowth hardwoods (see Photo #1).

Other unsuitable habitat areas observed at the Project include Austin Run and its immediate floodplain, an unnamed tributary in the southeastern portion, areas of steep slopes, and disturbed areas, especially along Winding Creek Road and an existing powerline easement that extends through the southernmost portion of the Project and just north of Embrey Mill Road, as shown on the Aerial Photograph Exhibit. The portion of the easement that is not currently grassed and mowed/maintained is dominated by young saplings of tulip poplar (*Liriodendron tulipifera*), sweetgum (*Liquidambar styraciflua*), and red maple (*Acer rubrum*) ranging in size from a couple of inches to a foot in DBH.

During the detailed habitat assessment and field survey, several areas of potential suitable habitat for the small whorled pogonia were identified in the eastern portion of the Project along relatively level to moderate slopes with a northerly or easterly slope aspect. The approximate location and extent of these potential suitable habitat areas, labeled P1 through P5, are depicted with hatching on the attached Aerial Photograph and Existing Conditions Exhibits. These areas were surveyed in detailed for small whorled pogonia by walking transects through each area.

As generally shown in Photos #2 through #6, Areas P1 through P5 are dominated by relatively mature (>12-inch DBH) hardwood forest consisting of white oak (*Quercus alba*), southern red oak (*Quercus falcata*), American beech (*Fagus grandifolia*) and hickory (*Carya* sp.) in the

Letter to Mr. Frank Lackman, Winding Creek, LLC Winding Creek (Musselman Property), Stafford County, Virginia – Small Whorled Pogonia Survey July 31, 2015 Page 3 of 3

overstory, with saplings of the above species and large specimens of flowering dogwood (*Cornus florida*) in the understory. These areas are characterized by relatively sparse shrub and groundcover layers dominated by roundleaf greenbrier (*Smilax rotundifolia*), mapleleaf viburnum (*Viburnum acerifolium*), Virginia creeper (*Parthenocissus quinquefolia*), blueberry (*Vaccinium* sp.), and striped prince's pine (*Chimaphila maculata*).

Based on the results of the July 9, 2015 field survey, no individuals or populations of small whorled pogonia were observed within the Project area. It should also be noted that no individuals or populations of whorled pogonia (*Isotria verticillata*) were observed within the Project. A population of Indian cucumber (*Medeola virginiana*) was observed near Area P4; the presence of this population resulted in a thorough search of the adjacent Area P4. These species, while not on Federal or State-protected species listings, have habitat requirements similar to those of the small whorled pogonia and are often used as indicators of potential suitable habitat.

This small whorled pogonia survey is limited to conditions prevailing at the time the survey was conducted. Because of the small whorled pogonia's life cycle, the fact that this species was not observed within the Project area during the July 9, 2015 site visit does not entirely eliminate the possibility that it may appear in subsequent growing seasons and/or that the USFWS may require additional surveys in subsequent growing seasons. As directed by the USFWS Virginia Field Office, species surveys for the small whorled pogonia can be conducted in areas north of Caroline County, Virginia between June 1st and July 20th of any given year, and the results of these surveys are valid for a period of two (2) years. Species surveys may be conducted sooner or later than those dates based upon site-specific information or prevailing favorable climatological conditions; however, prior approval should be obtained from the USFWS Virginia Field Office.

Please note that copies of this Small Whorled Pogonia Survey Report will need to be forwarded to the U.S. Army Corps of Engineers and the Virginia Department of Environmental Quality during the wetland permitting process for the Project for further coordination with the U.S. Fish & Wildlife Service and the Virginia Department of Conservation and Recreation, as necessary.

If you have any questions concerning the results of the Survey, please feel free to contact me or Ms. Jessica Fleming of BCG at 703.464.1000.

# Sincerely, **BOWMAN CONSULTING GROUP, LTD.**

Jessica L. Fleming, Q.E.P., P.W.D., Senior Project Manager On Behalf of Philip Abell, Senior Environmental Scientist

Enclosure: Small Whorled Pogonia Predictive Model Exhibit Aerial Photograph Exhibit Existing Conditions Exhibit Representative Photographs

### Small Whorled Pogonia - Predicted Suitable Habitat







Predicted Suitable Habitat



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and



Attachment 11 Page 181 of 185

SMALL WHORLED POGONIA SURVEY AERIAL PHOTOGRAPH EXHIBIT

WINDING CREEK Parcel 29-4 Stafford County, Virginia

SCALE: 1"=200'

DATE: July 31, 2015



Bowman Consulting Group, Ltd. 3863 Centerview Drive, Suite 300 Chantilly, Virginia 20151

Austin Ru

Phone: (703) 464-1000 Fax: (703) 481-8410 www.bowmanconsulting.com





**Photo #1:** Representative view of current site conditions throughout the Project, showing the forest dominated by young regrowth trees with a relatively dense understory, which is considered unsuitable habitat for small whorled pogonia.



**Photo #2:** Representative view of current site conditions in Area P1 in the northern portion of the Property along a north-facing slope above Austin Run, showing potential suitable habitat for the small whorled pogonia consisting of relatively mature hardwood forest with a relatively open understory and sparse groundcover.



**Photo #3:** Representative view of current site conditions in Area P2 in the northern portion of the Project along an eastern-facing slope, showing potential suitable habitat for the small whorled pogonia consisting of relatively mature hardwood forest with a relatively open understory and sparse groundcover.



**Photo #4:** Representative view of current site conditions in Area P3 in the central-eastern portion of the Project along a northeast-facing slope, showing potential suitable habitat for the small whorled pogonia consisting of relatively mature hardwood forest with a relatively open understory and sparse groundcover.


**Photo #5:** Representative view of current site conditions in Area P4 in the central portion of the Project along a northeast-facing slope, showing potential suitable habitat for the small whorled pogonia consisting of relatively mature hardwood forest with a relatively open understory and sparse groundcover.



**Photo #6:** Representative view of current site conditions in Area P5 in the southern portion of the Project along a northeast-facing slope, showing potential suitable habitat for the small whorled pogonia consisting of relatively mature hardwood forest with a relatively open understory and sparse groundcover.

# **Project Information & Primary Contacts**

DROIFOT DECONAL				
PROJECT INFORMATIO	<u>N</u>	PROJECT #	161513	333
Winding Creek				
PROJECT NAME		-	SECTION	
327 Winding Creek Road		_	61.227	
ADDRESS (IF AVAILABLE)			TOTAL SITE ACREAGE	
Z9-4 TAX MAP /PARCEL(S)		-		
Approximately, 7 miles Nor	th of interportion of Courthour	ne Deed and M6		
LOCATION OF PROJECT		se Roau and wi	nding Creek Road	
APPLICANT/AGENT (Pro	ovide attachment if	Primary Cont	act Person 🗖	
Erank Lookmon (analicant)	Sileant and Agent unity			
			ek Owner, LLC	
1256 Welton Court	Centreville	COMPANY VA	20120	
ADDRESS	CITY	STATE	ZIP	
703-463-1808	,	flackman@so	omersethomes.com	
PHONE NUMBER	FAX NUMBER	EMAIL ADDDESS		
		EMAIL ADDRESS		
OWNER (Provide stracks		D i C		
<u>OWNER</u> (Provide attachm	ents if multiple owners)	Primary Cont	act Person 🛛	
<u>OWNER</u> (Provide attachm Earl F. Musselman Trust (c	ents if multiple owners) /o John J. Musselman, Truste	Primary Cont	act Person 🛛	
<u>OWNER</u> (Provide attachm Earl F. Musselman Trust (c NAME 200 Chatham Heights Road	ents if multiple owners) /o John J. Musselman, Truste	Primary Conta	act Person 🗆	
OWNER (Provide attachm Earl F. Musselman Trust (c NAME 200 Chatham Heights Road ADDRESS	ents if multiple owners) d John J. Musselman, Truste Fredericksb	Primary Conta Primary Conta COMPANY Durg VA	act Person 🗆 22405	
OWNER (Provide attachm Earl F. Musselman Trust (c NAME 200 Chatham Heights Road ADDRESS	ents if multiple owners) d John J. Musselman, Truste d Fredericksb	Primary Conta ee) COMPANY burg VA STATE	act Person 🗆 22405 ZIP	
OWNER (Provide attachme Earl F. Musselman Trust (c NAME 200 Chatham Heights Road ADDRESS PHONE NUMBER	ents if multiple owners) d John J. Musselman, Truste d Fredericksb CITY FAX NUMBER	Primary Conta ee) COMPANY burg VA STATE EMAIL ADDRESS	act Person 🗆 22405 ZIP	
OWNER (Provide attachm Earl F. Musselman Trust (c NAME 200 Chatham Heights Road ADDRESS PHONE NUMBER	ents if multiple owners) d John J. Musselman, Truste d Fredericksb CITY FAX NUMBER	Primary Conta ee) COMPANY purg VA STATE EMAIL ADDRESS	act Person 🗆 22405 ZIP	
OWNER (Provide attachm Earl F. Musselman Trust (c NAME 200 Chatham Heights Road ADDRESS PHONE NUMBER PROFESSIONAL (Enginee	ents if multiple owners) /o John J. Musselman, Truste d Fredericksb CITY FAX NUMBER r. Surveyor, etc.)	Primary Cont Primary Cont COMPANY DUIG VA STATE EMAIL ADDRESS Primary Cont	act Person 🗆 22405 ZIP act Person 🗖	
OWNER (Provide attachm Earl F. Musselman Trust (c NAME 200 Chatham Heights Road ADDRESS PHONE NUMBER PROFESSIONAL (Enginee Bill Pyle	ents if multiple owners) d Fredericksb CITY FAX NUMBER r, Surveyor, etc.)	Primary Conta ee) COMPANY burg VA STATE EMAIL ADDRESS Primary Conta Bowman Conta	act Person 🗆 22405 ZIP act Person 🗆	
OWNER (Provide attachm Earl F. Musselman Trust (c NAME 200 Chatham Heights Road ADDRESS PHONE NUMBER PROFESSIONAL (Enginee Bill Pyle NAME	ents if multiple owners) d Fredericksb CITY FAX NUMBER r, Surveyor, etc.)	Primary Conta COMPANY Durg VA STATE EMAIL ADDRESS Primary Conta Bowman Conta COMPANY	act Person 🗆 22405 zip act Person 🗖 nsulting	
OWNER (Provide attachm Earl F. Musselman Trust (c NAME 200 Chatham Heights Road ADDRESS PHONE NUMBER PROFESSIONAL (Engineer Bill Pyle NAME 650A Nelms Circle	ents if multiple owners) /o John J. Musselman, Truste d Fredericksb CITY FAX NUMBER r, Surveyor, etc.) Fredericksbur	Primary Conta company burg VA state EMAIL ADDRESS Primary Conta Bowman Con COMPANY	act Person 🗆 22405 zip act Person 🗆 nsulting VA 224	06
OWNER (Provide attachm Earl F. Musselman Trust (c NAME 200 Chatham Heights Road ADDRESS PHONE NUMBER PROFESSIONAL (Enginee Bill Pyle NAME 650A Nelms Circle ADDRESS	ents if multiple owners) /o John J. Musselman, Truste d Fredericksb CITY FAX NUMBER T. Surveyor, etc.) Fredericksbur CITY	Primary Conta COMPANY Durg VA STATE EMAIL ADDRESS Primary Conta Bowman Conta COMPANY	act Person 🗆 22405 ZIP act Person 🗆 nsulting VA 224 STATE ZIP	06
OWNER (Provide attachm Earl F. Musselman Trust (c NAME 200 Chatham Heights Road ADDRESS PHONE NUMBER PROFESSIONAL (Enginee Bill Pyle NAME 650A Nelms Circle ADDRESS 540-371-0268	ents if multiple owners) 2/0 John J. Musselman, Truste d Fredericksb CITY FAX NUMBER T, Surveyor, etc.) Fredericksbur CITY 540-371-3479	Primary Conta company burg VA state EMAIL ADDRESS Primary Conta Bowman Con COMPANY	act Person 22405 ZIP act Person nsulting VA 224 STATE ZIP manconsulting.com	06
OWNER (Provide attachm Earl F. Musselman Trust (c NAME 200 Chatham Heights Road ADDRESS PHONE NUMBER PROFESSIONAL (Enginee Bill Pyle NAME 650A Nelms Circle ADDRESS 540-371-0268 PHONE NUMBER	ents if multiple owners) d Fredericksb CITY FAX NUMBER T, Surveyor, etc.) Fredericksbur CITY 540-371-3479 FAX NUMBER	Primary Conta COMPANY Durg VA STATE EMAIL ADDRESS Primary Conta Bowman Conta COMPANY 'g bpyle@bown EMAIL ADDRESS	act Person 22405 ZIP act Person nsulting VA 224 STATE ZIP manconsulting.com	06

# **Project Information & Primary Contacts**

PROJECT INFORMATIO	N	PROJECT #
Winding Creek		
PROJECT NAME 327 Winding Creek Road		SECTION 61.227
ADDRESS (IF AVAILABLE)		TOTAL SITE ACREAGE
29-4		<u>A1</u>
TAX MAP /PARCEL(S)		ZONING DISTRICT
Approximately .7 miles Nor	th of intersection of Courthous	se Road and Winding Creek Road
LOCATION OF PROJECT		
APPLICANT/AGENT (Pro App	ovide attachment if licant and Agent differ)	Primary Contact Person 🛛
Charles W. Payne, Jr. (age	nt)	Hirschler Fleischer
NAME		COMPANY
725 Jackson Street, Suite 2	200 Fredericksburg	VA 22401
ADDRESS	CITY	STATE ZIP
		EMAIL ADDRESS
<u>OWNER</u> (Provide attachm	ents if multiple owners)	Primary Contact Person 🛛
NAME		COMPANY
ADDRESS	CITY	STATE ZIP
PHONE NUMBER	FAX NUMBER	EMAIL ADDRESS
PROFESSIONAL (Enginee	r, Surveyor, etc.)	Primary Contact Person 🛛
NAME		COMPANY
ADDRESS	CITY	STATE ZIP
PHONE NUMBER	FAX NUMBER	EMAIL ADDRESS

### **Statements of Understanding**

I, as owner/co-owner of the property subject to this application, do hereby certify that I have read and understand the requirements for the submission of a reclassification as provided under the Stafford County Code, and further, that this submittal is in compliance with the requirements and applicable provisions of the Stafford County Zoning Ordinance, Chapter 28 of the Stafford County Code.

re of Owner/Co Owner

5. Musselman 6-16-16

Printed Name

Date

Date

Signature of Owner/Co Owner

Signature of Owner/Co Owner

Printed Name

Printed Name

Date

I, as applicant or agent for the owner(s) of the property subject to this application, do hereby certify that I have read and understand the requirements for the submission of a reclassification as provided under the Stafford County Code, and further, that this submittal is in compliance with the requirements and applicable provisions of the Stafford County Zoning Ordinance, Chapter 28 of the Stafford County Code.

Signature of Applicant/Agent

Printed Name

Date

\* Additional sheets may be used, if necessary.

# Statements of Understanding

I, as owner/co-owner of the property subject to this application, do hereby certify that I have read and understand the requirements for the submission of a reclassification as provided under the Stafford County Code, and further, that this submittal is in compliance with the requirements and applicable provisions of the Stafford County Zoning Ordinance, Chapter 28 of the Stafford County Code.

Signature of Owner/Co Owner	Printed Name	Date
Signature of Owner/Co Owner	Printed Name	Date
Signature of Owner/Co Owner	Printed Name	Date

I, as applicant or agent for the owner(s) of the property subject to this application, do hereby certify that I have read and understand the requirements for the submission of a reclassification as provided under the Stafford County Code, and further, that this submittal is in compliance with the requirements and applicable provisions of the Stafford County Zoning Ordinance, Chapter 28 of the Stafford County Code.

Signature of Applicant/Agent

X. Lackman 6/15/2016

**Printed Name** 

\* Additional sheets may be used, if necessary.

#### STAFFORD COUNTY REZONING & CONDITIONAL USE PERMIT APPLICATIONS OWNER'S NOTARIZED CONSENT

We, the undersigned, do hereby authorize the applicant, Winding Creek Owner, LLC, or its successors and assigns (collectively "Applicant"), to file on my behalf all rezoning, conditional use permit, special use permit or other land use or permitting applications necessary to rezone and develop Tax Map Parcel 29-4 from Agricultural-1 to R-1 with a cluster or other zoning designation as the Applicant may reasonably determine, and further authorize the Applicant, at is sole cost and expense, to procure, file and provide all necessary studies, application content regarding said property, any proffer statements, plans and other application materials, and to undertake all other actions necessary to obtain approval for all of the same.

#### **OWNERS ACKNOWLEDGMENT & CONSENT**

The Earl F. Musselman Trust created November 28, 2001

BY:

COMMONWEALTH OF VIRGINIA, CITY/COUNTY OF <u>InedemcKsburg</u>, to wit:

The foregoing instrument was acknowledged before me this 12 day of 2016, by John J. Musselman, Trustee for The Earl F. Musselman Trust created November 28, 2001, owner.

My Commission expires: 8/31/2018Notary Registration number: 4060695

7894988-1 039798.00001



# **General Information**

Clearly indicate all information that applies to this project:

#### DETAILED DESCRIPTION OF PROJECT

Rezoning of the property from A-1 to R-1 to allow for a cluster subdivision known as Winding Creek

consisting of no more than 97 single-family detached units with an average lot size of 0.213 acres

and a density of 1.58 dwelling units per acre.

### INFORMATION FOR FEE CALCULATIONS

Type of Rezoning:

- Standard Rezoning
- Planned Development
- Proffer Amendment
- Minor Proffer Amendment
- Minor Proffer Amendment (when submitted simultaneously with Minor Conditional Use Permit Application)

#### **INFORMATIONAL**

Previous Ordinance #\_\_\_\_\_

Previous Resolution # \_\_\_\_\_

# of Lots (if rezoning to residential) 97

Original Zoning A-1

Proposed Zoning R-1

Proposed Use(s) \_\_\_\_\_ Single family detached homes.

## **Review Fee Calculations**

#### **STAFFORD COUNTY FEES:**

The County review fee calculations are divided into four sections. Each section is based on a different type of reclassification. Determine the application fee by filling out the one section that applies.

Section I. Standard Rezoning:			
A. Base Fee: (Required - Enter the dollar amount that applies) If less than 5.0 acres	. \$	12,500.00	ALOG.B
B. General Fee: (If greater than 5 acres)			110
( <u>61.227</u> Acres - 5) X \$125 54.227 X 125	\$	7,028.37	
C. Fire & Rescue Review Fee (required)	\$	125.00 🗸	
D. Utilities Department Review Fee (required)	\$	215.00	
E. Public Works Review Fee (required)	\$	200.00	
F. Traffic Impact Analysis Review Fee: (If TIA required) Volume <1,000 VPD\$200.00 Volume >1,000 VPD\$400.00	. \$	400.00	
K. Adjacent Property Notification (required):			
( <u>12</u> Adjacent properties) X \$6.48	. \$	77.76	
Sub-total (Add appropriate amounts from lines A thru G above)	\$	20,546.13	
H. Technology Fee (sub-total x 2.75% or 0.0275)	\$	565.02	
TOTAL (Sub-total + H. Technology Fee)	\$	21,111.15 🗸	

#### Section IV. Minor Proffer Amendment:

A. General Fee:	\$ <u>6,190.00</u>
B. Adjacent Property Notification (required):	
(Adjacent properties) X \$6.48	\$
Sub-total (Add lines A and B)	\$
C. Technology Fee (sub-total x 2.75% or 0.0275)	\$
TOTAL (Sub-total + C. Technology Fee)	\$

# Section V. Minor Proffer Amendment (when submitted simultaneously with minor Conditional Use Permit Application):

A. General Fee:	\$	3,095.00
B. Adjacent Property Notification (required):		
(Adjacent properties) X \$6.48	. \$	
Sub-total (Add lines A and B)	\$	
C. Technology Fee (sub-total x 2.75% or 0.0275)	\$	
TOTAL (Sub-total + C. Technology Fee)	\$ <u> </u>	

#### Sections I, II, III, IV and V: MAKE CHECK PAYABLE TO "STAFFORD COUNTY".

- If an application is withdrawn prior to the first public hearing, fifty (50) percent of the amount of the application fee may be refunded to the applicant.
- If an application is withdrawn after the first public hearing, the application fee is non-refundable.

#### VIRGINIA DEPARTMENT OF TRANSPORTATION FEES:

#### **Transportation Impact Analysis Fee:**

(For applications that meet VDOT Traffic Impact Analysis thresholds)

A. Subject to low volume road criteria (see 24 VAC 30-155-40 A 3)	\$ 250.00
B. All other submissions	\$ 1000.00

#### MAKE CHECK PAYABLE TO "VIRGINIA DEPARTMENT OF TRANSPORTATION"

For a third or subsequent submission of a rezoning proposal that is requested by VDOT on the basis of the failure of the applicant to address deficiencies previously identified by VDOT, the fee is equal to the initial fee paid. (per 24 VAC 30-155, §15.2-2222.1 of the Code of Virginia)

n

# List of Adjoining Property Owners

The applicant is required to provide a list of the owners as shown on the current real estate tax assessment books of all abutting properties and properties immediately across the street or road from the property to be rezoned or issued a Conditional Use Permit. If the application requests a rezoning of only a portion of the parcel or a Conditional Use Permit on only a portion of the parcel, the entire parcel must be the basis for the below listing.

Provide additional pages if needed.

See	attached list		
TAX MAP / PARCEL	NAME		
MAILING ADDRESS			
СІТҮ		STATE	ZIP
TAX MAP / PARCEL	NAME		
MAILING ADDRESS			
СІТҮ		STATE	ZIP
TAX MAP / PARCEL	NAME		
MAILING ADDRESS			
CITY		STATE	ZIP

# List of Adjoining Property Owners

Tax Map Parcel:	29 5K & 29E	D-5J N	Name: Autumn	ı Ridge	Home	owners' Association
Mailing Address:	P.O. Box 726	8				
City: Fredericksbu	Irg	State:	VA		Zip:	22404-7268
Tax Map Parcel:	29 5A	Name: V	Villard, SueEll	en		
Mailing Address:	47 Wet Rock	Lane				
City: Stafford		State:	VA		Zip:	22554-6815
Tax Map Parcel:	29 5C	Name: J	ohn J. Musselr	man, Ti	rustee	
Mailing Address:	200 Chatham	Heights R	load			
City: Fredericksbu	ırg	State:	VA		Zip:	22405
Tax Map Parcel:	29 9H	Name: S	Schuldt, Tamm	y Lynr	1	
Mailing Address:	362 Winding	Creek Roa	ad			
City: Stafford		State:	VA		Zip:	22554
Tax Map Parcel:	29D 5 159	Name: S	Susan C. Burke	ett		
Mailing Address:	28 Fireberry I	Boulevard				
City: Stafford	State:	V	VA Z	Zip:	22554	-7925
Tax Map Parcel:	20S 15 L	Name: P	ark Ridge Hor	neown	ers' As	ssociation Inc.
Mailing Address:	c/o Landmarc	Real Esta	ite Co., P.O. B	ox 726	8	
City: Fredericksbu	rg State:	v	/A 2	Zip:	22404	-7268

Tax N	Iap Parcel:	29 3D	Name:	Horizons Chu	rch	
Mailin	ng Address:	12 Flatford Ro	bad			
City:	Stafford	State:		VA	Zip:	22554-3949
Tax M	fap Parcel:	29E 1 B	Name:	Brookstone H	omes at	Berkshire Inc.
Mailir	ng Address:	P.O. Box 523				
City:	Garrisonville	State:		VA	Zip:	22463-0523
Tax M	lap Parcel:	29E 2 D	Name:	Berkshire Hor	neowne	ers Association Inc.
Mailir	ng Address:	P.O. Box 7268	3			
City:	Fredericksbur	g State:		VA	Zip:	22404-7268
Tax M	Iap Parcel:	29 9C	Name:	Embrey, Edwi	n L. Sr	. & Evelyn F.
Mailir	ng Address:	28 Embrey Mi	II Road			
City:	Stafford	State:		VA	Zip:	22554-6808
Tax M	Iap Parcel:	29 8A	Name:	Embrey, Tami	ny Lyn	n
Mailin	ıg Address:	362 Winding (	Creek R	oad		
City:	Stafford	State:		VA	Zip:	22554-6801
Tax M	lap Parcel:	29 8D	Name:	Embrey, Edwi	n L. &	Evelyn Frances
Mailin	g Address:	28 Embrey Mi	ll Road			
City:	Stafford	State:		VA	Zip:	22554-6808

7895010-1 039798.00001

# Application Affidavit

#### This form to be filed with:

#### STAFFORD COUNTY BOARD OF SUPERVISORS

#### 1300 COURTHOUSE ROAD STAFFORD, VIRGINIA 22555

Project Name:	Internal Use Only WINDING CREEK
A/P #:	10151333
Date:	00/17/10

All applicants for a special exception, a special use permit, conditional use permit, amendment to the zoning ordinance or variance shall make complete disclosure of the equitable ownership of the real estate involved in the application, including in the case of corporate ownership, limited liability company ownership or similar business ownership, the name of stockholders, officers, managing partners, general partners, owners and members, and in any case the names and addresses of all of the real parties in interest. The requirement of listing names of stockholders, officers and directors shall not apply to a corporation whose stock is traded on a national or local stock exchange and having more than 500 shareholders. In the event the ownership of the involved real estate changes in any respect during the time the application is pending, the applicant shall make complete disclosure of the new equitable ownership of the real estate involved in the application as required herein. If the applicant is a contract purchaser, the ownership information required herein shall be provided for the contract purchaser in addition to the owner of the real estate involved in the application. This section applies to applications before the board of supervisors, planning commission and board of zoning appeals.

See Section 15.2-2289 for State Enabling Authority

#### 1. Applicant information

Name of Applicant Name of Company	Frank Lackman Winding Creek Owner, LLC
Applicant Address	15256 Welton Court Centreville, VA 20120
Applicant's Signature	Grank Xack
Name of Agent	Charles W. Payne, Jr.
Address of Agent	725 Jackson Street, Suite 200, Fredericksburg, VA 22401
2. Type of Application	
Conditional U	se Permit 🗌 Variance
X Rezoning	□ Special Exception
	Page 13

Earl F. Musselman Trust

Application Affidavit Page 2 Applicant: <u>Winding Cr</u>	reek Owner, LLC	Project Name: Windinn Creek A/P #: 101513333 Date: 9/11110
3. Property Information	n	
Assessors Parcel(s)	29-4	
Address	327 Winding Cree	ek Road
4. Unless the equitable ownership, list all equi	ownership is a corp itable owners of the	oration, limited liability company or similar business property.
Name of owners	Address	

5. If the equitable ownership of the property is a corporation, limited liability company or similar business ownership, list all officers, managing partners, general partners, share holders, owners and members. This provision shall not apply if the corporation is listed on a national or local stock exchange and has more than 500 share holders.

200 Chatham Heights Road, Fredericksburg, VA 22405

Name of Members	Address	
N		

6. Unless the applicant is a contract purchaser and is a corporation, limited liability company or similar business ownership, list all individuals involved with the purchase of the property.

 Name of Members
 Address

Page 14

Application Affidavit		Project Name:	Winding Creek
Applicant:	Winding Creek Owner, LLC	Date:	

7. If the applicant is a contract purchaser and is a corporation, limited liability company or similar business ownership, list all officers, managing partners, general partners, share holders, owners and members. This provision shall not apply if the corporation is listed on a national or local stock exchange and has more than 500 share holders

Kevin J. O'Shea	15256 Welton Court, Centreville, VA 20120
Sonny Esposito	15256 Welton Court, Centreville, VA 20120
Frank X, Lackman	15256 Welton Court, Centreville, VA 20120

8. Have all individuals listed on this affidavit been notified of the purpose of the application?

🗙 Yes 🗌 No

9. If #8 is No, list all individuals who have not been notified about this application plus submit the cost required for the Department of Planning and Zoning or Code Administration to send certified letters notifying those listed below of this application prior to the public hearing.

Name <u>A</u>	Address, including zip code, no P.O. Box please		
Number of owners to be no	otified:X		
Cost for certified letters	<pre>\$ (cost as of the day of submittal)</pre>		
Total due:	<b><u>\$</u> (Make checks payable to County of Stafford)</b>		

Please submit a check in the amount due with this application to cover the cost of serving the individuals listed in this section.

		Project Name: Windink Creek	
Application Affidavit Page 4 Amaliant Winding Creek Owner, LLC		A/P #: Date:	
Applicant:		· · · · · · · · · · · · · · · · · · ·	

**10. Affirmation & Witness** 

I hereby make oath or affirmation that the contents of this affidavit are true and correct to the best of my knowledge, information and belief. In the event the ownership of the involved real estate changes during the time the application is pending, I shall make complete disclosure of the new equitable ownership of the real estate involved in the application as required herein.

Printed name of Signer tra Corporate Office of Signer 110 n. L Signature Date

#### COMMONWEALTH OF VIRGINIA COUNTY OF STAFFORD, to wit:

The forgoing affidavit was acknowledged before me this 15 day of  $\sqrt{2016}$  by

Frank X Lackman	owner/applicant.	AN1111111111111
My commission expires:	5 31 201 3 NAN	UCTORIA SUS
		COMMALL
	Victoria S. M	allor 23 July AND
	Notary Public	A OF VIRGINIA

## **Checklist for Generalized Development Plans (GDP)**

In accordance with Section 28-224 of the Stafford County Code, when a GDP involves engineering, architecture, urban land use planning or design, landscape architecture, or surveying, such work shall be performed by persons qualified and authorized to perform such professional work, in accordance with applicable provisions of the Code of Virginia.

N/A	COMPLETE	
		Sec 28-225(1)
	Ľ	Date of drawing,
	E C	true north arrow,
	L.	scale,
	B	legend for all symbols used,
		name of the applicant,
	<u>ا</u>	name of the owner,
	E,	name of the development,
	Ľ	person preparing the drawing,
	لکا ا	match lines if applicable;
		Sec 28-225(2)
	<b>S</b>	Boundaries of the area covered by the application,
	<u>د</u>	vicinity map showing the general location of the proposed development,
		major roads and existing subdivisions at a scale of one inch equals two
		thousand (2,000) feet;
	,	Sec 28-225(3)
	E)	Approximate locations and identification of any easements and rights-of-
		way on or abutting the site;
	,	Sec 28-225(4)
	BÍ	Approximate location of each existing and proposed structure on the site
ম্র		the number of stories,
		height,
		roof line,
B		gross floor areas and
		location of building entrances and exits;
		Sec 28-225(5)
	12	Identification and location of uses and structures on all abutting
		properties;
		Sec 28-225(6)
5		Approximate location of all existing and proposed parking and loading
		areas,
	E	outdoor trash storage,
		lighting facilities, and
	DŞ	pedestrian walkways;
	. /	Sec 28-225(7)
	ЪŹ	Approximate location, height and type of each existing and proposed
	·	wall, fence, and other types of screening;

#### **Checklist for Generalized Development Plans (continued)**

N/A	COMPLETE	
	,	Sec 28-225(8)
		Approximate location and description of all proposed landscaping; Sec 28-225(9)
	Ċ	Approximate location, height and dimensions of all proposed signage on site;
_		Sec 28-225(10)
	Ľ	Approximate location of all existing drainage ways, floodplains and wetlands on site;
	N/	Sec 28-225(11)
	Ø	Approximate location of all common open space, recreational areas and bufferyards; Sec 28-225(12)
<b>F</b>		Where the site abuts any tidal water body or impoundments, the approximate high water line, low water line, top of bank and toe of slope;
X		Approximate location and identification of all significant natural or noteworthy features including, but not limited to, historic and archeological sites, cemeteries, existing trees with a trunk diameter greater than six (6) inches DBH

#### Waiver of GDP Requirements

In accordance with Section 28-223 of the Stafford County Code, the Director of Planning and Zoning may waive the requirement for the submission of a GDP if the application meets one of the following standards:

- (1) There will be less than two thousand five hundred (2,500) square feet of total land disturbance on lots or parcels of less than ten thousand (10,000) square feet.
- (2) For single-family dwellings intended for the occupancy of the applicant and where there will be less than five thousand (5,000) square feet of land disturbance.
- (3) For specific items of information when, in the opinion of the director of planning, their application to the subject property does not serve the purpose and intent of this article.

A request for a waiver shall be made in writing to the Director of Planning and Zoning identifying the sections in which you are requesting a waiver and the reason for the request.

#### RECLASSIFICATION TRANSPORTATION IMPACT ANALYSIS DETERMINATION

 Name of development
 Winding Creek

 Type of development
 Residential

 Parcel #
 29-4

#### Traffic Volume Calculations

This site generates:

<u>102</u> VPH (highest VPH)

<u>1,021</u> VPD on state controlled highways (highest)

\_\_\_\_78\_\_\_VPH Peak AM

102 VPH Peak PM

\_\_\_\_95\_\_\_VPH Peak Saturday

1,021 VPD highest intensity\*

\*\*\*Attach a page showing the calculations and the ITE trip generation codes to this form.\*\*\*

#### Minimum Thresholds to submit a TIA

County: Any proposals generating 1,000 or more VPD. VDOT: See "VDOT Traffic Impact Analysis Requirements" table on next page.

#### **Trip Generation Calculation Guidelines**

- Traffic volumes shall be based on the rates or equations published in the latest edition of the Institute of Transportation Engineers Trip Generation.
- If a site has multiple entrances to highways, volumes on all entrances shall be combined for the purposes of this determination.
- If the site does not have direct access to a state maintained road, the site's connection is where the site connects to the state highway system.
- Traffic volumes shall NOT be reduced through internal capture rates, pass by rates, or any other reduction methods.
- For redevelopment sites only: when the existing use is to be redeveloped as a higher intensity use, trips currently generated by the existing development that will be removed may be deducted from the total trips that will be generated by the proposed land use.
- When rezoning, use the highest possible traffic generating use unless development is limited by proffer to less than the possible highest traffic generation.

For development proposals that generate 1000 or more vehicle trips per peak hour the applicant shall request a scope of work meeting with VDOT and Stafford County Office of Transportation to discuss the required elements of a traffic impact analysis.

\*The highest intensity use is the highest possible use allowable under the zoning requirements for the entire property should it be developed to its fullest extent possible under the current building guidelines. The only exception is if proffers limit the area and type of uses.

RECEIVED BUT NOT OFFICIALLY		
SUBMITTED:		
DATE UI INITIALS		
OFFICIALLY SUBMITTED:		
DATE: INITIALS		

#### myStafford Payments Home > Account Search > Account Details

#### Stafford County Real Estate Tax Search/Payment Owner **Property Description Current Assessment** Name / Mailing Address 29-4 \$642,900 Map # Land Value MUSSELMAN JOHN J TRUSTEE Alt. ID/PIN 17906 Improvment Value: \$163,600 200 CHATHAM HEIGHTS RD **327 WINDING CREEK RD** Legal Land Use Value: \$101,400 FREDERICKSBURG VA 22405-2571 Total Taxable Value \$265,000 View Real Estate Details Pay Total Due Today: \$0.00 OPay Total For Year: \$1,311.75 O Select Invoices to Pay OPay Another Amount: \$0.00 Next **Invoice History** Filter by Year Paid to get tax payments for a particular year Bill Type Year Paid - ALL -~ - ALL - V **Clear Filter** Print Version Filter Results Change Penalty/Interest Calculation Date Total Due: Total Tax Paid \$1,311,75 \$40.908.65 Total Penalty/Int Paid: \$196.30 Total Fees Paid \$0.00 Total Other Assessments \$0.00 Year BIII # Туре Due Date Rate Levy Due Penalty Due Interest Due **Total Due** Total Paid Date Paid 2016 17654 **Real Estate** 12/5/2016 0.990 \$1.311.75 \$0.00 \$0.00 \$1,311.75 \$0.00 2016 17654 **Real Estate** 6/6/2016 0.990 \$1.311.75 \$0.00 \$0.00 \$0.00 \$1,311,75 6/3/2016 2015 17664 Real Estate 12/7/2015 1.019 \$1,241.14 \$0.00 \$0.00 \$0.00 \$1,241.14 12/3/2015 2015 17664 Real Estate 6/5/2015 1.019 \$1,241,14 \$0.00 \$0.00 \$0.00 \$1,241.14 6/3/2015 2014 17675 **Real Estate** 12/5/2014 1.019 \$1,241.14 \$0.00 \$0.00 \$0.00 \$1,241.14 12/5/2014 2014 17675 Real Estate 6/5/2014 1.019 \$1,241.14 \$0.00 \$0.00 \$0.00 \$1,241.14 6/4/2014 2013 17686 **Real Estate** 12/5/2013 1.070 \$1,204.29 \$0.00 \$0.00 \$0.00 \$1,204.29 11/26/2013 2013 17686 Real Estate 6/5/2013 1.070 \$1,204.29 \$0.00 \$0.00 \$0.00 \$1,204.29 6/5/2013 2012 17701 **Real Estate** 12/5/2012 1.070 \$1,160.42 \$0.00 \$0.00 \$0.00 \$1,160.42 12/4/2012 7017 1.070 17701 Dast Ectsta 6/10/2012 ¢1 160 47 40.00 ¢0.00 en nn 41 160 42 6/12/2012 Go Back





METES AND BOUNDS DESCRIPTION ON THE LANDS OF JOHN J. MUSSELMAN, TRUSTEE OF THE EARL F. MUSSELMAN TRUST, CREATED U/A/D NOVEMBER 28, 2001 LR 060036235 TAX MAP 29, PARCEL 4 ROCK HILL MAGISTERIAL DISTRICT STAFFORD COUNTY, VIRGINIA Attachment 12 Page 21 of 32

#### TAX MAP 29, PARCEL 4 (PORTION WEST OF WINDING CREEK ROAD)

BEGINNING AT A POINT, SAID POINT BEING AN IRON PIPE SET (IPS) IN THE WESTERLY RIGHT OF WAY LINE OF WINDING CREEK ROAD – VIRGINIA STATE ROUTE 628 (40' WIDE RIGHT OF WAY) AND CORNER TO LANDS NOW OR FORMERLY STANDING IN THE NAME OF EMBREY (TAX MAP 29, PARCEL 9C – DEED BOOK 778, PAGE 62); THENCE, DEPARTING SAID WINDING CREEK ROAD – VIRGINIA STATE ROUTE 628 (40' WIDE RIGHT OF WAY) AND RUNNING WITH SAID EMBREY (TAX MAP 29, PARCEL 9C – DEED BOOK 778, PAGE 62) TWO (2) COURSES AS FOLLOW:

N 68°10'45" W 76.19' TO A POINT, SAID POINT BEING A NAIL FOUND IN A STUMP; THENCE

N 73°32'16" W 234.92' TO A POINT, SAID POINT BEING A PINCHED TOP PIPE FOUND (PPF) IN THE LINE OF SAID EMBREY (TAX MAP 29, PARCEL 9C – DEED BOOK 778, PAGE 62) AND CORNER TO PARCEL D – COMMON AREA OF BERKSHIRE – SECTION TWO (PM 050000258) BEING LANDS NOW OR FORMERLY STANDING IN THE NAME OF BERKSHIRE HOMEOWNERS ASSOCIATION INC. (TAX MAP 29E-2-D – LR 070000884); THENCE, WITH SAID PARCEL D – COMMON AREA OF BERKSHIRE – SECTION TWO (PM 050000258), IN PART, AND PARCEL B – COMMON AREA OF BERKSHIRE – SECTION ONE (PM 040000281) BEING LANDS NOW OR FORMERLY STANDING IN THE NAME OF BROOKSTONE HOMES AT BERKSHIRE, INC. (TAX MAP 29E-1-B – LR 030049099), IN PART, AND THE WESTERLY RIGHT OF WAY LINE OF WINDING CREEK ROAD – VIRGINIA STATE ROUTE 628 (40' WIDE RIGHT OF WAY) IN PART,

N 13°18'51" E, PASSING THROUGH A NAIL IN A STUMP FOUND AT 1,485.50, 1676.54' IN TOTAL, TO A POINT, SAID POINT BEING N 15°36' E 2.2' FROM A PPF AND IN THE AFOREMENTIONED WESTERLY RIGHT OF WAY LINE OF WINDING CREEK ROAD – VIRGINIA STATE ROUTE 628 (40' WIDE RIGHT OF WAY); THENCE, CONTINUING WITH SAID WESTERLY RIGHT OF WAY LINE OF WINDING CREEK ROAD – VIRGINIA STATE ROUTE 628 (40' WIDE RIGHT OF WAY) FIVE (5) COURSES AS FOLLOW:

292.64' ALONG THE ARC OF A CURVE DEFLECTING TO THE RIGHT (NON-TANGENT TO PREVIOUS COURSE) WITH A RADIUS OF 3185.00', A CENTRAL ANGLE OF 05\*15'52", AND A CHORD BEARING AND DISTANCE OF S 17\*38'15" E, 292.54' TO A POINT; THENCE

S 15°00'19" E 279.90' TO A POINT OF CURVATURE; THENCE

352.47' ALONG THE ARC OF A CURVE DEFLECTING TO THE RIGHT WITH A RADIUS OF 630.00', A CENTRAL ANGLE OF 32°03'20", AND A CHORD BEARING AND DISTANCE OF S 01°01'21" W, 347.89' TO A POINT; THENCE

# Bowman

S 17°03'01" W 707.14' TO A POINT OF CURVATURE; THENCE 157.96' ALONG THE ARC OF A CURVE DEFLECTING TO THE LEFT WITH A RADIUS OF 1388.00', A CENTRAL ANGLE OF 06°31'14", AND A CHORD BEARING AND DISTANCE OF S 13°47'24" W, 157.88' TO THE POINT OF BEGINNING AND CONTAINING 10.73486 ACRES OF LAND, MORE OR LESS.

#### TAX MAP 29, PARCEL 4 (PORTION EAST OF WINDING CREEK ROAD)

BEGINNING AT A POINT, SAID POINT BEING IN THE EASTERLY RIGHT OF WAY LINE OF WINDING CREEK ROAD – VIRGINIA STATE ROUTE 628 (40' WIDE RIGHT OF WAY) AND ALSO BEING N 13°24' E 1.6' FROM A PPF ; THENCE, RUNNING WITH SAID EASTERLY RIGHT OF WAY LINE OF WINDING CREEK ROAD – VIRGINIA STATE ROUTE 628 (40' WIDE RIGHT OF WAY), IN PART, AND LANDS NOW OR FORMERLY STANDING IN THE NAME OF HORIZONS CHURCH (TAX MAP 29, PARCEL 3D – LR 070022104), IN PART,

N 13°24'05" E, 942.92' TO A POINT, SAID POINT BEING S 13°24' W 0.3' FROM AN IRON PIPE FOUND (IPF) AS CORNER TO SAID HORIZONS CHURCH (TAX MAP 29, PARCEL 3D – LR 070022104) IN THE LINE OF PARCEL L – OPEN SPACE OF PARK RIDGE – SECTION 15 (PLAT BOOK 34, PAGE 291 – TAX MAP 20S-15-L) BEING LANDS NOW OR FORMERLY STANDING IN THE NAME OF PARK RIDGE HOMEOWNERS' ASSOCIATION INC. – LR 990002954); THENCE, WITH SAID PARCEL L – OPEN SPACE OF PARK RIDGE – SECTION 15 (PLAT BOOK 34, PAGE 291 – TAX MAP 20S-15-L)

S 25°11'06" E 345.15' TO A POINT, SAID POINT BEING CORNER TO PARCEL L – OPEN SPACE OF PARK RIDGE – SECTION 15 (PLAT BOOK 34, PAGE 291 – TAX MAP 20S-15-L) AND PARCEL J – COMMON AREA OF AUTUMN RIDGE – SECTION 5 (PLAT BOOK 33, PAGE 112 – TAX MAP 29D-5-J) BEING LANDS NOW OR FORMERLY STANDING IN THE NAME OF AUTUMN RIDGE HOMEOWNER'S ASSOCIATION (LR 990010224) AT OR NEAR THE CENTER OF AUSTIN RUN ; THENCE, WITH SAID PARCEL J – COMMON AREA OF AUTUMN RIDGE – SECTION 5 (PLAT BOOK 33, PAGE 112 – TAX MAP 29D-5-J), IN PART, AND LOT 159 OF AUTUMN RIDGE – SECTION 5, IN PART,

S 24°53'58" E 913.94' TO A POINT, SAID POINT BEING AN IRON ROD FOUND (IRF) AS CORNER TO SAID LOT 159 OF AUTUMN RIDGE – SECTION 5 AND CORNER TO LANDS NOW OR FORMERLY STANDING IN THE NAME OF JOHN J. MUSSELMAN, TRUSTEE OF THE EARL F. MUSSELMAN TRUST, CREATED U/A/D NOVEMBER 28, 2001 (TAX MAP 29, PARCEL 5C – LR 070002671); THENCE, WITH SAID JOHN J. MUSSELMAN, TRUSTEE OF THE EARL F. MUSSELMAN TRUST, CREATED U/A/D NOVEMBER 28, 2001 (TAX MAP 29, PARCEL 5C – LR 070002671)

S 25°31'17" E 834.63' TO A POINT, SAID POINT BEING A 2" IPF AS CORNER TO SAID JOHN J. MUSSELMAN, TRUSTEE OF THE EARL F. MUSSELMAN TRUST, CREATED U/A/D NOVEMBER 28, 2001 (TAX MAP 29, PARCEL 5C – LR 070002671) AND LANDS NOW OR FORMERLY STANDING IN THE NAME OF WILLARD (TAX MAP 29, PARCEL 5A – LR 960000168); THENCE, WITH SAID LANDS OF WILLARD (TAX MAP 29, PARCEL 5A – LR 960000168)

S 25°46'47" E 605.37' TO A POINT, SAID POINT BEING AN IPF IN THE LINE OF SAID LANDS OF WILLARD (TAX MAP 29, PARCEL 5A – LR 960000168) AND CORNER TO LANDS NOW OR FORMERLY STANDING IN THE NAME OF AUTUMN RIDGE HOMEOWNER'S ASSOCIATION (TAX MAP 29, PARCEL 5K – LR 960007980); THENCE, WITH SAID LANDS OF AUTUMN RIDGE HOMEOWNER'S ASSOCIATION (TAX MAP 29, PARCEL 5K – LR 960007980)

S 44°46'42" W 873.04' TO A POINT, SAID POINT BEING AN IPF AS CORNER TO SAID LANDS OF AUTUMN RIDGE HOMEOWNER'S ASSOCIATION (TAX MAP 29, PARCEL 5K – LR 960007980) AND LANDS NOW OR FORMERLY STANDING IN THE NAME OF EMBREY (TAX MAP 29, PARCEL 8D – DEED BOOK 169, PAGE 506); THENCE, WITH SAID LANDS OF EMBREY (TAX MAP 29, PARCEL 8D – DEED BOOK 169, PAGE

# Bowman

506), IN PART, AND OTHER LANDS NOW OR FORMERLY STANDING IN THE NAME OF EMBREY (TAX MAP 29, PARCEL 8A – NO DEED REFERENCE FOUND), IN PART,

N 68°10'45" W 609.48' TO A POINT, SAID POINT BEING AN IPS AS A POINT OF CURVATURE IN THE NORTHERLY RIGHT OF WAY LINE OF EMBREY MILL ROAD – VIRGINIA STATE ROUTE 733 (50' WIDE RIGHT OF WAY); THENCE, WITH SAID NORTHERLY RIGHT OF WAY LINE OF EMBREY MILL ROAD – VIRGINIA STATE ROUTE 733 (50' WIDE RIGHT OF WAY) TWO (2) COURSES AS FOLLOW:

104.50' ALONG THE ARC OF A CURVE DEFLECTING TO THE LEFT (NON-TANGENT TO PREVIOUS COURSE) WITH A RADIUS OF 300.00', A CENTRAL ANGLE OF 19°57'32", AND A CHORD BEARING AND DISTANCE OF N 59°43'06" W, 103.98' TO A POINT, SAID POINT BEING AN IPS; THENCE

N 69°41'52" W 180.44' TO A POINT, SAID POINT BEING AN IPS AT A POINT OF CURVATURE IN THE AFOREMENTIONED EASTERLY RIGHT OF WAY LINE OF WINDING CREEK ROAD – VIRGINIA STATE ROUTE 628 (40' WIDE RIGHT OF WAY); THENCE, CONTINUING WITH THE SAID EASTERLY RIGHT OF WAY LINE OF WINDING CREEK ROAD – VIRGINIA STATE ROUTE 628 (40' WIDE RIGHT OF WAY) SIX (6) COURSES AS FOLLOW:

150.67' ALONG THE ARC OF A CURVE DEFLECTING TO THE RIGHT WITH A RADIUS OF 1348.00', A CENTRAL ANGLE OF 06°24'16", AND A CHORD BEARING AND DISTANCE OF N 13°50'53" E, 150.60' TO A POINT; THENCE

N 17°03'01" E 707.14' TO A POINT OF CURVATURE; THENCE

374.85' ALONG THE ARC OF A CURVE DEFLECTING TO THE LEFT WITH A RADIUS OF 670.00', A CENTRAL ANGLE OF 32°03'20", AND A CHORD BEARING AND DISTANCE OF N 01°01'21" E, 369.98' TO A POINT; THENCE

N 15°00'19" W 279.90' TO A POINT OF CURVATURE; THENCE

336.05' ALONG THE ARC OF A CURVE DEFLECTING TO THE LEFT WITH A RADIUS OF 3225.00', A CENTRAL ANGLE OF 05°58'13", AND A CHORD BEARING AND DISTANCE OF N 17°59'25" W, 335.90' TO A POINT; THENCE

N 20°58'32" W 19.80' TO THE POINT OF BEGINNING AND CONTAINING 50.49199 ACRES OF LAND, MORE OR LESS.

#### **STAFFORD COUNTY, VIRGINIA**

#### ZONING RECLASSIFICATION AND CONDITIONAL USE PERMIT APPLICATION

#### **IMPACT STATEMENT**

Applicant:	Winding Creek Owner, LLC
Property Owner:	John J Musselman, Trustee of the Earl F. Musselman Trust
Property:	Tax Parcel 29-4
Rezoning Request:	From A-1 to R-1
Project Name:	Winding Creek
CUP Request:	Cluster subdivision in the R-1 District
Date:	June 15, 2016
<u>File No</u> .	RC CUP

#### **Application Request**

The property owner, as provided above (collectively the "Owner"), through the contract purchaser, Winding Creek Owner, LLC, or its assigns or successors (the "Applicant"), hereby requests a rezoning of the following property from Agricultural (A-1) to Suburban Residential (R-1) in accordance with the Stafford County Zoning Ordinance (the "Zoning Ordinance"), including without limitation Article III, Section 28-35, Article X, Section 28-161, et seq., and Article XII Section 28-201, et seq.:

Tax Parcel 29-4 (of record by Instrument No. LR060036235) (the "Property"), consisting of approximately 61.227 acres total, and generally located approximately 0.7 miles north of the Courthouse Road and Winding Creek Road intersection, within the Rock Hill Magisterial District and the Garrisonville Magisterial District, all as more particularly described on the attached "Winding Creek Generalized Development Plan" dated May 2014, as last revised June 6, 2016, prepared by Bowman Consulting, which plan is incorporated as a material part of this application by this reference (the "GDP")<sup>1</sup>.

<sup>&</sup>lt;sup>1</sup>The GDP is a general overview of the proposed development and improvements to the Property in accordance with Article XIII, Section 28-221, et seq., of the Zoning Ordinance. The Applicant reserves the right to make modifications or amendments to the GDP in order to address final site engineering, architectural, and design issues, internal road placements and entry areas, RPA requirements, and to ensure compliance with applicable federal, state and county regulations, laws and ordinances.

The R-1 district permits cluster subdivisions by right, except for densities greater than 1.5 dwelling units per acre, which then require a conditional use permit ("CUP"). Concurrently with the proposed rezoning, the Applicant requests a CUP to develop the Property for a cluster subdivision all as shown on the GDP.

We have also included with this application several illustrative elevations and renderings depicting the proposed architectural design and building material features, which only include general type, character, and quality of architectural design, details, and materials, all as generally shown on sheets 10 and 11 of the GDP (collectively, the "Renderings").

#### *This application provides the following key development features:*

- (1) no more than 97 single-family detached units;
- (2) average lot size of 0.213 acres;
- (3) density of 1.58 dwelling units per acre
- (4) open space of 33.291 acres, or 54.4% of the Property, far exceeding the R-1 district's minimum requirement;
- (5) clustering of lots to promote appropriately dense development;
- (6) proffered architectural and design features as generally provided on the Renderings;
- (7) dedication of 0.84 acres of right of way along Winding Creek Road to widen the right of way to a width of sixty feet (60'), plus the 0.78 ac of right of way along Embrey Mill Road to allow for the future relocation of that road as shown on GDP;
- (8) an approximate 10.33 acre open space area for transportation buffering and passive recreation activity west of Winding Creek Road;
- (9) monetary cash proffers of \$2,619,000, all as provided more particularly in the attached proffer statement;
- (10) project is located within Stafford County's (the "County") Urban Service Area, and will connect to public water and sewer; and
- (11) project is consistent with the County's Comprehensive Plan (the "Comp Plan"), as described below.

#### <u>Overview</u>

As noted above, the Property is currently zoned A-1. The Applicant proposes changing the zoning of the Property from A-1 to R-1 and to allow a clustered subdivision. Section 28-34 of the County's Zoning Ordinance states the following concerning the R-1 district:

The purpose of the R-1 district is to provide areas which are in close proximity to existing or future development of equivalent or higher densities, and which are intended for low density residential development where public water and sewerage facilities are available. Development in the R-1 district is intended to be characterized by single-family dwellings.

Pursuant to Article III, Section 28-35 of the Zoning Ordinance, a CUP is required in order to develop a cluster subdivision in the R-1 district if the applicant requests a density of dwelling units greater than 1.5 per acre. The Zoning Ordinance defines "cluster" as "[a] subdivision development design technique that concentrates detached single-family dwellings in specific areas on the site to allow the remaining land to be used for recreation, common open space, and preservation of environmentally sensitive features and rural character . . ."

Cluster subdivisions in the R-1 district permit an average density of up to 2.25 dwelling units per acre, while conventional subdivisions permit an average density of up to 1.5 dwelling units per acre. The proposed development includes 1.58 dwelling units per acre, which requires a conditional use permit.

The Applicant's proposed cluster subdivision includes 97 lots located on approximately 61.227 acres. The GDP reflects 33.291 acres of open space accounting for approximately 54.4% of the Property. This far exceeds the 30 percent minimum required by the R-1 district for cluster subdivisions. The open space will be used for stormwater management facilities, and recreational and natural areas.

The Property is bisected by Winding Creek Road, which intersects Courthouse Road approximately 0.7 miles to the south of the Property. Embrey Mill Road and Wetrock Lane border the Property immediately to the south. Adjacent and nearby properties are generally developed as similar cluster subdivisions, while some nearby properties are wooded. Existing and planned residential subdivisions in the area include Berkshire, Embrey Mill, Augustine North, Colonial Forge, Liberty Knolls, and Austin Ridge. The Applicant's proposal will be compatible with existing and planned uses in the area and proposed home prices will average approximately \$525,000. Additionally, the Applicant's proposal will further enhance the local housing stock while maintaining the rural character of the area through inclusion of appropriate buffering and open space.

As described below, the Applicant's proposal conforms to the policies established by the Comp Plan. Adjacent properties will experience minimal impacts. Furthermore, the proposal will result in minimal impacts on public facilities and services, and impacts related to roads, schools, and parks will be offset through proffers.

In regard to the foregoing, the Applicant retained S. Patz and Associates, Inc. ("Patz"), to review the proposed project and prepare a fiscal impact analysis. Patz's analysis, entitled "Market and Fiscal Impacts Analyses Winding Creek Subdivision Stafford, Virginia," dated May 2014 (the "FIA"), concludes, in relevant part, that the Applicant's proposed project will generate gross county tax revenues of approximately \$1,176,170 annually with a net fiscal benefit of \$357,390 (on and off-site impacts), all in constant 2014 dollars. The consultant also applied three different pupil generation rates of 1.3, 1.06 and 0.66 per household. The net revenue findings (see page 34 of the report) range from \$546,000 to \$244,230, all of which are a net positive surplus. Based on these factors, the proposal will result in a net benefit to the County and its citizens and the project will pay for itself from an operating expense perspective, which surplus also contributes to necessary county capital improvements. Please also see additional details regarding the analysis in the attached FIA, which was been submitted as a material part of this application.

#### **Comprehensive Plan**

#### Future Land Use Map

The Comp Plan's Future Land Use Map classifies the Property as part of the "Suburban" designation. This designation encourages low density residential development, as well as limited commercial development. Development is expected to occur on quarter to half acre lots, with densities of up to three dwelling units per acre. Townhouses and multifamily development are generally discouraged. Additionally, the Suburban designation promotes preservation of sensitive environmental features and open space through use of innovative development techniques such as clustering and planned unit developments. The Plan encourages preservation of 25 to 50 percent of land for a combination of natural and usable open space.

The Suburban designation supports the Applicant's proposed development consisting of single family detached dwellings. The GDP provides for approximately 1.58 dwelling units per acre, which is within the Comp Plan's density policy of 3.0 dwelling units per acre. The GDP also shows 54.4% of the Property as open space in the form of stormwater management facilities, and recreational and natural areas. This exceeds the Plan's policy of preserving 25 to 50 percent of land for both natural and usable open space. In general, the type and density of the proposed development, as well as the preserved open space, meet the Suburban designation's policies.

The Plan's Quantico Noise and Range Compatibility Zones Map includes the property in Noise Zone 1. Properties in Zone 1 may experience occasional noise of less than 62 dB from the Quantico Marine Corps Base. This level of noise causes minimal impact on the properties within Zone 1.

#### Urban Service Area

The Comprehensive Plan includes the Property in the "Urban Service Area". This designation attempts to funnel new development in the County to the land around I-95 and other major transportation corridors in order to take advantage of existing public utilities in the area. The Urban Service Area supports any new development which is compatible with the Property's Future Land Use Map designation.

The Property's location in the Urban Service Area supports the project's utilization of existing public utilities. Based on nearby development patterns, several nearby subdivisions are already utilizing public utilities, which means the Applicant should be able to extend water and sewer lines from nearby rights of way in order to serve the Property.

#### **Transportation**

The Property is located north of Embrey Mill Road and is bisected by Winding Creek Road, both of which are classified as rural local roads. The Comprehensive Plan's Anticipated Transportation Needs Map designates Winding Creek Road as a 2-lane road requiring upgrades.

The types of upgrades are not specified. For purposes of the foregoing and as provided in the Applicant's proffer statement, the Applicant will proffer dedication of 0.84 acres of right of way along Winding Creek Road to widen the right of way to a width of sixty feet (60') at a value of \$74,343.89, as generally shown on the GDP. Additionally, the Applicant will proffer dedication of 5.61 acres of right of way for internal subdivision roads to be maintained by VDOT, plus the 0.78 acres for relocation of Embrey Mill Road, all as generally shown on the GDP.

#### **Impact Analysis**

#### 1. <u>Current capacity of and anticipated demands on highways, utilities, storm</u> <u>drainage, schools and recreational facilities</u>.

A. <u>Highways</u>. Based on the Traffic Impact Analysis, dated June 13, 2016, prepared by Bowman Consulting (the "TIA"), the project will generate 1,021 new trips per 24 hour period. Of these trips, 78 new trips will occur during the AM peak hour and 102 new trips will occur during the PM peak hour. These traffic volumes do not exceed traffic thresholds outlined in §15.2-2222.1 of the Code of Virginia and the Virginia Traffic Impact Analysis Regulations (24 VAC 30-155), which are commonly referred to as "Chapter 527" requirements. Primary access to the Property is proposed via two full movement entrances along Winding Creek Road. Internal roadways will be terminated via a "cul-de-sac" alignment. In addition, the TIA shows that 2021 traffic conditions with the build out of the Property will be adequately accommodated at the study intersections with no need for offsite improvements.

We are not aware of any specific traffic volume capacity based on the classification by either the County or VDOT. Classification is based on the function and character of the road than the volume of traffic it could (or should) carry. For instance, a six-lane divided urban roadway designed to serve numerous business while carrying 30,000 vehicles per day could have a lower functional classification than a two-lane rural road carrying 8,500 vehicles per day and designed to carry traffic between regional destinations.

Stafford County's Comprehensive Plan calls for development applications to meet a Level of Service C or better or to show non-degradation. The TIA shows that all studied intersections will operate at LOS C or better with the exception of the westbound approach to the Eustace Road/Northampton Blvd/Hampton Park Road intersection which operates at LOS E during the PM peak hour under existing conditions. The analysis shows that the approach would continue to operate at LOS E in 2021 with or without the buildout of the site. Therefore the application meets Stafford County's Comprehensive Plan requirement of LOS C or non-degradation. To offset any alleged impacts the Applicant will dedicate 60' of right-ofaway along Winding Creek Road at a value of \$74,343.89 and not develop on the west side of Winding Creek Road, as shown on the GDP, at a value of \$895,657. Please review further details in the attached proffer statement.

By Right Impact: If the Property is developed as a cluster subdivision under the existing A-1 zoning, the maximum traffic intensity would occur with build out of approximately 20 single family residential dwelling units. Pursuant to a by-right clustered development, the aggregate new daily trips would be approximately 771 per a 24 hour period, 54 new trips during the AM peak hour, and 76 new trips during the PM peak hour.

 <u>Utilities</u>. As noted above, the proposed rezoning is located within the County's Urban Service Area and has access to public water and sewer. The proposed project will have minimal impact on utility demands. Existing water and sewer lines are located in the Winding Creek Road right of way. These utility lines and applicable water and sewer treatment facilities appear to have available capacity, or the reasonable ability to be upgraded to provide adequate capacity.

<u>Public Water</u>: This project is located in the Garrisonville Zone. There is an existing 12" DIP water line in the Winding Creek Road right of way. Onsite water lines will generally be constructed along the proposed roads within the development creating loops and networks throughout the Property. The anticipated daily demand for water is as follows: 97 lots x 240 gpd/lot = 23,280 gpd

<u>Sewer</u>: This project is located in the Austin Run sewer service area. An existing 12" sewer line is located in the Winding Creek Road right of way. Onsite sewer lines will generally be constructed along the proposed roads within the development creating loops and networks throughout the Property. The anticipated daily demand for sewer is as follows: 97 lots x 300 gpd/lot = 29,100 gpd

<u>By-Right Impact</u>: If the Property is developed as a cluster subdivision under the existing A-1 zoning, the maximum traffic intensity would occur with build out of approximately 20 single family residential dwelling units. Under this scenario, the anticipated daily demand for water and sewer follows: Water - 20 lots x 240 gpd/lot = 4,800 gpd

water - 20 lots x 240 gpd/lot = 4,800 gpd Sewer - 20 lots x 300 gpd/lot = 6,000 gpd

C. <u>Storm Drainage</u>. The proposed development will incorporate low impact development techniques as well as conventional stormwater management techniques in order to reduce the post-developed runoff from the site to

pre-developed levels in accordance with County and State requirements. The GDP depicts four stormwater management facilities, and projects that approximately 19.22% of the Property will consist of impervious surface, which is a relatively low percentage for a subdivision of this size. The proposed development will have minimal impacts downstream of the Property.

By Right Impact: Since both a by-right development and the proposed development would be subject to the same stormwater management regulations, both the by-right and proposed developments would result in the same post-developed flow requirements and would have minimal impacts downstream.

D. <u>Schools</u>. The proposed rezoning will generate sufficient revenue to pay for any impacts to the school system, all as more particularly provided in the FIA. It is estimated that the project will generate approximately 64 to 127 school aged pupils (depending on formula applied of 0.66, which is county wide number per unit or 1.06, which is the average number including new developments or 1.3 which is the average for new developments only) as provided in the attached FIA. As noted above, we believe the Applicant's project will generate adequate net tax revenue (on-site and off-site) to pay for annual operational impacts to the County's schools and additional dollars towards necessary capital improvements. The Applicant will also provide cash proffers in the amount of \$1 million dollars to offset any school capital impacts in the relevant school attendance zone area of the Property. Please review additional details in the attached proffer statement.

By Right Impact: A by-right development would result in approximately 20 dwelling units or approximately 14 to 26 school aged students without the benefit of any proffers for school improvements.

E. <u>Recreational Facilities</u>. The proposed rezoning will have minimal impact on park and recreational facilities. The GDP includes significant open space, including approximately 10.33 acres of open space west of Winding Creek Road, which will serve as a passive recreation area. Additionally, the GDP provides for a sidewalk system that can be connected to the surrounding residential neighborhoods. The Applicant will also provide cash proffers in the amount of \$200,000 for new park facilities. Please review additional details in the attached proffer statement.

<u>By-Right Impact</u>: A by-right development would generate approximately 20 dwelling units without the benefit of any proffers for park improvements as provided in the attached proffer statement.

- 2. **Fiscal Impact**. The FIA concludes that for purposes of complete build-out, the project will generate (based on 2014 constant dollars) approximately \$1,176,170 in gross annual tax revenues for the county with a net annual tax revenue benefit of \$357,390, all as provided more particularly in the attached FIA. In addition and as noted above, the FIA applied three different school aged generation number of 0.66, 1.06 and 1.3 all as shown in the FIA. In applying these three variations of school aged impact numbers, the annual net tax revenue surplus generated by the project is projected at \$244,230 to \$546,00. In essence, the project will pay for itself as applied to the costs of annual county services, plus generate additional tax dollars for use towards necessary county capital improvements. The FIA's assumptions are based on several factors, including the County's current tax rate, budget and CPI projections, County estimates for the costs for public services, market business activity (including BRAC, courthouse and hospital industry expansion) and conditions, and County demographics, all as more particularly described in the FIA.
- 3. **Environmental Impact.** A Wetland Delineation was completed for the Property by Bowman Consulting Group, Ltd. (Report and Map dated April 25, 2014, revised August 27, 2014), and approved by the U.S. Army Corps of Engineers under Jurisdictional Determination No. NAO-2014-00895 dated September 12, 2014. A Perennial Flow Evaluation and Critical Resource Protection Area (CRPA) Determination study was also completed for the Property by Bowman Consulting Group, Ltd. (Report and Map dated April 25, 2014) and approved by Stafford County on July 22, 2014 (AP# 1400209). As depicted on the GDP, two perennial streams are located on the Property: Austin Run is located at the Property's north end, and an unnamed tributary is located on the Property's east side. The portions of these perennial streams located on the Property total 466 linear feet; all other stream channels located on the Property were determined to be non-perennial, or intermittent. The GDP also depicts approximately 0.61 acre of palustrine wetlands located throughout the Property; none of these wetlands were determined to be contiguous to or connected by surface flow to a perennial stream. In accordance with the County's CBPA Policy and Virginia Department of Conservation and Recreation's Resource Protection Areas: Nontidal Wetlands, Guidance on the Chesapeake Bay Preservation Area Designation and Management Regulations, the CRPA boundaries are mapped 100-feet upslope or landward of the surveyed perennial stream boundaries, encompassing approximately 2.4 acres of the Property. As depicted on the GDP, the proposed development will not impact any perennial streams or their associated CRPAs.

A threatened and endangered species evaluation was completed by Bowman Consulting Group, Ltd. based on information obtained from the U.S. Fish and Wildlife Service, the Virginia Department of Conservation and Recreation, and the Virginia Department of Game and Inland Fishers for the Property. Additionally, habitat assessment and field surveys for the State-listed endangered and Federal-listed threatened small whorled pogonia (Isotria medeoloides) were conducted on the Property by Bowman Consulting Group, Ltd. (Reports dated July 31, 2013 and updated July 31, 2015). Based on existing site habitat conditions and the results of the threatened and endangered species evaluation and small whorled pogonia surveys, no adverse impacts to Federal or State-listed threatened and endangered species or critical habitat are anticipated from the development of the Property.

The proposed development has been designed to avoid disturbance to the CRPA and the majority of the wetlands and streams on the Property, with only minor impacts to environmentally sensitive features proposed, and those impacts being within the thresholds of the Virginia Water Protection (VWP) General Permit WP4 and the State Program General Permit (12-SPGP-01). If permanent impacts exceed 0.1 acre of wetlands and/or 300 linear feet of stream channel, appropriate compensatory mitigation will be provided through the purchase of wetland and/or stream credits from approved mitigation bank(s), or as otherwise required by the U.S. Army Corps of Engineers and Virginia Department of Environmental Quality permits. No impacts are proposed to the CRPA, nor are any adverse impacts to threatened and endangered species or critical habitat anticipated. Less than 0.01 acre of land within the CRPA is proposed to be located on subdivision lots; however, these areas are located outside of the buildable areas for the lots, and construction activities on these lots will not impact the CRPA.

<u>By-Right Impact</u>: Any development utilizing the same developable area will have the same impacts on environmentally sensitive features.

- 4. **Impact on Adjacent Properties.** Nearby properties are either wooded or developed for cluster subdivisions similar to the Applicant's proposal. The GDP provides for appropriate buffering along shared property lines and rights of way to maintain the rural character of the area and to minimize impacts on adjacent properties. The proposed low density residential development is compatible with and similar to development on surrounding properties and is a positive in-fill residential development plans in accordance with the Comp Plan policies for this area.
- 5. <u>**Historical Sites.**</u> This Property has no known archeological or architecturally significant sites. Accordingly, there is no impact to historical sites under the proposed development.

7928938-1 039798.00001

- 1. <u>RC16151333; Reclassification Winding Creek</u> A proposed reclassification from the A-1, Agricultural Zoning District to the R-1, Suburban Residential Zoning District, to allow for a greater density, single-family detached dwelling unit subdivision, of up to 97 units, to be developed on Tax Map Parcel No. 29-4. The property consists of 61.23 acres; is located at the intersection of Winding Creek Road and Embrey Mill Road, within the Garrisonville and Rock Hill Election Districts; and is concurrently under consideration for a conditional use permit to allow a greater density cluster subdivision in the R-1 Zoning District. (**Time Limit: January 6, 2017**)
- <u>CUP16151334</u>; <u>Conditional Use Permit Winding Creek</u> A request for a Conditional Use Permit (CUP) to allow a cluster subdivision of up to 2.25 dwelling units per acre on Tax Map Parcel No. 29-4, which is concurrently under consideration for a reclassification from the A-1, Agricultural Zoning District to the R-1, Suburban Residential Zoning District. The property consists of 61.23 acres, located at the intersection of Winding Creek Road and Embrey Mill Road, within the Garrisonville and Rock Hill Election Districts. (**Time Limit: January 6, 2017**)

Mr. Harvey: Thank you Mr. Chairman. The next agenda item is a rezoning, as well as a conditional use permit for the Winding Creek project; if you could please recognize Kathy Baker for the presentation.

Mr. Apicella: Thank you Ms. Baker.

Ms. Baker: Good evening. And I will be presenting both of these in one combined presentation. May I have the computer please? This application is a reclassification, as well as a conditional use permit for Winding Creek. This is a reclassification from A-1, Agricultural to R-1, Suburban Residential Zoning District. The conditional use permit is for a cluster subdivision with increased density, as allowed in the Zoning Ordinance. The applicant is Winding Creek Owner, LLC, and Mr. Charles Payne is the agent here this evening that will be representing the applicant and property owners. And this does split the Garrisonville and Rock Hill Election Districts. Just as a refresher, there were similar applications that went through the Planning Commission and the Board of Supervisors in 2014 and 2015. The Board of Supervisors did end up turning down the application in 2015 in the fall. And this was primarily due to concerns from residents of the adjacent Autumn Ridge development regarding a street connection at Fireberry Boulevard, which was an existing street in their neighborhood. And under Virginia Department of Transportation requirements, this connection from the new proposed neighborhood would had to have been made to that Fireberry Boulevard. So, the application has now been revised to remove one specific parcel from the application and, therefore, that's removing the requirement for the connection to Fireberry. And I'll show you some more as we go through the presentation. Also, the differences in the application were included in Attachment 2 in your packages. As you can see, the subject property, outlined in yellow, you see Embrey Mill Road to the south or the lower bottom portion of the screen. Winding Creek Road actually separates the parcel... one parcel, approximately 10 acres to the west and then the remaining subject property. You'll see the surrounding neighborhoods, Autumn Ridge Subdivision to the east or on the right-hand side, and Berkshire Subdivision to the west. Also, to the north is Park Ridge Subdivision. And to the south is Embrey Mill Road which eventually will extend and connect to the new Embrey Mill development. As you can see, the majority of the parcel is forested and there is one single-family residence that fronts on Winding Creek Road. The small rectangle, red rectangle that you see was the original parcel that was included with the prior application, about 1.9 acres, and that has now been removed from this application. And as you see on the screen in that vicinity, in this area... okay, right where you can see Fireberry Boulevard -- thank you Jeff -- in that connection is where the connection would have been made from the new development. And this is a zoning map

#### Planning Commission Minutes September 28, 2016

showing the A-1 parcel and you have R-1 to the east and the west, PD-1 to the north, and A-2 up in the top left corner. And then A-1 also to the south of the property. And this is the future land use designation which is Suburban for the subject property, as well as the surrounding properties. You do see Resource Protection to the top of the screen and this is surrounding Austin Run. This is just a bird's eye view from Winding Creek Road/Embrey Mill Road intersection looking to the northeast. And you can see the single-family residence that fronts on Winding Creek Road. This is just a view looking from Winding Creek Road as you're headed north. So, the 10-acre parcel on the left-hand side and then the frontage of the property in the vicinity of the single-family residence on the right. And this is the proposed Generalized Development Plan with the new application. Let me try one more time to see if I can highlight. As you see, I've turned the project now just so it will fit on the screen. No, it's not working. Jeff, if you could highlight please Winding Creek Road with your two entrances into the subdivision off of Winding Creek Road. That's the northern entrance, this is the southern entrance. And there will be one future inter-parcel connection down to the bottom of your screen. That goes into a parcel that's actually owned by the Autumn Ridge Homeowner's Association. It contains a private gravel road called Wet Rock Lane that serves several private lots... or individual lots off of Wet Rock Lane. To the left of the screen is future right-of-way dedication for realignment of Embrey Mill Road from the intersection of Winding Creek Road. And you can't really see on the GDP but there would be additional right-of-way dedication along the full frontage of Winding Creek for the property. There are areas of open space. To the top of the screen is the 10-acre separated parcel. That is intended to stay as an open space parcel. It would be dedicated ultimately to the County if the County desired to accept it. It may be that it would not serve the purposes for the County. In that case, if the County turns it down, then it would revert to the Homeowner's Association and be maintained as a preservation parcel that's currently wooded, as I stated prior. There's also additional open space parcels to the left of the screen, as open space in the vicinity under a Virginia Power easement. There is one overhead easement to the far left of the property, to the left side of the screen, but there is an underground utility. There are additional open space areas in between the lots where there's proposed a picnic and pavilion area in this vicinity. And a tot lot up in this vicinity. And then there are also Resource Protection Areas as I stated which would be located within open space areas. The total open space is about 54%; the requirement under cluster is 30%. And just to show you the prior GDP and the primary difference is the connection of Fireberry Boulevard. Jeff, if you could show that general area. And then the other change is the actual street extension on the other cul-desac near Wet Rock Lane. It previously went into a different adjacent parcel. And in comparison, this is what the new GDP looks like, so just a slight change to the cul-de-sac and then the extension into Fireberry. The applicant has submitted architectural renderings for what the homes would look like, and there are certain proffers that do discuss that are in compliance with these renderings. And I'll go over those in a little bit more detail. With regard to some of the transportation improvements, there was a traffic impact analysis that was submitted. It wasn't required; it did not meet the thresholds to be reviewed by VDOT. However, VDOT did review it. They did just send us a letter after your staff report went out and that was handed out to you all at your desks this evening. Generally, they concurred with the findings in the Traffic Impact Study which basically said that they're... that this development was not going to hinder any of the capacity for Winding Creek Road. They did have some safety recommendations and they did have one concern about the proposed crosswalk, which would come from the development across Winding Creek Road to the future park site. And that would be based on the warrants not being met for a pedestrian crosswalk. The area that you see circled is an area of improvement for a turn lane into the site and an acceleration lane coming out of the site along Winding Creek Road. Additionally, the red circle you see up to the top of the screen, that would be an offsite improvement for... there's a curve in this location along Winding Creek Road and to the left side of that curve is a hill with stone embedded. So, it is an area of concern for site distance for people traveling on that road. And I'll talk a little bit more and I'll show you a visual on that in just a moment. And then

#### Planning Commission Minutes September 28, 2016

again, you'll see the dedicated right-of-way for future Embrey Mill. One thing with the prior application and this application, the Comprehensive Plan does recommend upgrades to Winding Creek along the entire segment of Winding Creek in this area to a standard which would include safety improvements such as wider shoulders, sidewalk along the frontage, and the applicant has not proposed to do these improvements and that's just one carryover item that the staff would still recommend. This slide just shows the curve that you see as you're heading north. And this would be the afterview once this improvement would be made. The applicant has noted that there are third party considerations for this because they would need permission from these property owners. And they have had discussions with them in the past. If, for any reason, the applicant wasn't able to do the construction, the amount that they have determined, around \$412,000 I believe, would then go to cash towards the project. This is one additional item that was identified in the Traffic Impact Study that the intersection at Eustace Road, Northampton Boulevard, and Hampton Park would have an increased delay, but it already has a Level of Service E and the applicant has proffered to do a right-turn lane improvement from Northampton onto Eustace Road. And this improvement would actually reduce the Level of Service from E... excuse me, improve it from a Level E to a Level C. So, that would be in compliance with the Comp Plan. There may have been a misstatement in the staff report that that wasn't addressed. But it has been addressed in the proffers. With regard to schools, the proposed development would generate 64 students versus 13 under the by-right development, if it were developed under A-1. That's based on a student generation rate of .66 per household. The schools in this vicinity where students would attend is Winding Creek Elementary School, Rodney Thompson Middle School, and Colonial Forge High School. The capacities right now of those schools; Winding Creek is about 92%, I believe Rodney Thompson about 85%, and Colonial Forge is about 97% capacity. That's based on projected students this year; those weren't based on actual student counts. We didn't have that information available. The applicant is proffering a cash amount of \$16,000 plus per unit to go towards schools.

Mr. Apicella: Ms. Baker, before you move on, what would the number of students be under the new construction methodology?

Ms. Baker: I believe it would just about double, because I think the generation rate is around 1.3. So that would probably equate to close to 130 students, something like that. That's using the new developments as opposed to a countywide average which is spread across all types of housing units across the County.

Mr. Apicella: Thank you.

Ms. Baker: The applicant did submit a fiscal impact analysis. This was also submitted with the prior application. It determined that the net fiscal benefit would be a little over \$350,000 annually. The fiscal impact analysis did show three alternate scenarios, and those were based on the different student generation rates which is what you just asked about. Those costs would range between \$244,500 and 46,000 based on differences in the student generations. Just to go through the proposed proffers -- and I will note that the application was submitted prior to July 1<sup>st</sup> and you all are aware that there have been changes to state proffer legislation from the state level, and then the County followed suit to be in accordance with state law that we no longer have the monetary proffer guidelines. And so this application was submitted prior to that it would develop in accordance with the Generalized Development Plan, would commit to a general type character and quality of architectural design, and that includes front elevations of 75% of the units to be primarily brick. It would have operable windows on side elevations facing the street on corner lots, just to give some more accord with our Neighborhood Design Standards. All units would be brick or stone on any side facing the street. And your roofs would
be symmetrically sloped. There would be right-of-way dedication along Winding Creek Road, as I mentioned, as well as Embrey Mill Road. The right turn lane as I stated at the intersection of Eustace Road and Northampton Boulevard; the right turn taper and acceleration lane, as well as deceleration lane at the main entrance, the primary entrance into the property. Again, clearing and grading the curve with the hillside along Winding Creek Road to the north of the project offsite. Sidewalk to Winding Creek Road and a crosswalk connecting the east and west sides of Winding Creek Road, and, of course, that would obviously be the time of site plan development subject to VDOT approval. The dedication of approximately 10.3 acres of open space, which is that open space Parcel E on the west side of the road for recreational purposes. A total cash proffer amount of \$22,000-plus per unit. And the property would be encumbered with the conditions, covenants, restrictions, and easements prior to development and the creation of a Homeowner's Association. One of the covenants would be that homes... purchasers of homes along the VEPCO easement, they would be notified that at some time there could be overhead lines constructed within that easement.

Mrs. Bailey: Ms. Baker?

Ms. Baker: Yes.

Mrs. Bailey: Would that statement and disclosure be within the HOA disclosure? Or is that going to be a standalone disclosure made to first-time purchasers of the property? Do you know?

Ms. Baker: I'll have to get confirmation on that. I'm sure Mr. Payne can address that if you can wait for him to comment on that.

Mr. Apicella: Ms. Baker, before you move on, on the dedication of the open space, I'm looking at the proffer -- it's number 5. It says, open space Parcel E will be conveyed to the... in the event the County does not desire to accept the dedication of open space, Parcel E will be conveyed to the project's Homeowner's Association and restricted as to any use. I don't really know what that means, and I'm wondering if you've had any conversations with the applicant or their agent about putting a conservation easement on the 10.3 acres should the County not desire to use it for recreation purposes.

Ms. Baker: I'm not sure if that was discussed during the last application round. I did not personally have conversations with them during the review of this application.

Mr. Apicella: But putting an easement, a conservation easement would ensure that, again, they're not going to sell the property and/or put something else on there, the Homeowner's Association, should they take possession of it, right?

Ms. Baker: As long as the homeowner's were a valid conservation easement holder, determined to be a valid conservation easement holder.

Mr. Apicella: Okay, thanks.

Ms. Baker: Just a few more proffers. They would offer... the applicant would offer fire sprinkle systems as a purchase option in the homes. The plant materials and notification signage for properties... for lots that contain RPA would be installed prior to occupancy permits. A Phase 1 Cultural Resource Study has been proffered to be conducted, and a Phase 2 follow-up if warranted during the initial Phase 1. Proffers would limit the maximum number of homes to 97. There would be a 20-foot buffer between lots and the

lots that are located along Winding Creek Road; they would be between the lots and Winding Creek Road. The foundation, landscaping, and one tree would be planted in each rear yard to supplement some of the landscaping. There would be the tot lot and pavilion picnic areas which I showed on the GDP. And then there would be a buffer to the rear of lots 43 and 44 and the adjacent property. And just to summarize the Conditional Use Permit, under R-1 zoning, the applicant would be permitted up to 91 residential lots, or 1.5 units per acre. A conditional use permit would permit up to 137 lots based on 2.25 units per acre. So this would be an allowable increase of 46 lots. As I stated, this proposal's for 97 lots which is equivalent to 1.58 units per acre and an increase of 6 lots what would be permitted just under R-1 zoning without the increased density allowed by the conditional use permit. And the proposed conditions are very limited because generally everything is already covered in the proffers. Additionally, the conditions would be limiting to 97 units and then include the purchase option for the fire sprinkle systems. So, during the review, we do find that this proposal is consistent with the established development pattern in the vicinity. And the proposed uses and development pattern meets the intent of the Comprehensive Plan, including the Land Use, Transportation, building design, pedestrian connectivity, and open space recommendations. Also, their dedication of right-of-way would accommodate future planned transportation improvements. And the proffered improvements to Winding Creek Road as presented would improve safety. Just from the negative standpoint, the monetary proffers are below the per unit amount recommended under the current proffer guidelines which is around \$48,000. It is noted that there are several transportation and other improvements that do have an in-kind amount that the applicant has considered. And while the applicant has proffered the right-of-way dedication and certain improvements, they still, as I mentioned, have not proposed any upgrades to Winding Creek to that urban two-lane major local standard. And there's no timing at this point to make those improvements or VDOT. Staff is recommending approval of the rezoning, as well as the Conditional Use Permit. Pursuant to the Comprehensive Plan, we would recommend the applicant again consider upgrading Winding Creek Road. And with that I'll be happy to answer any questions.

Mr. Apicella: So, on that... on that last recommendation, upgrading the road to an urban two-lane major local standard, can you pull up the... either the GDP or something that shows that Winding Creek Road segment and how much of that road are you suggesting, or staff suggesting be upgraded to the urban two-lane?

Ms. Baker: Well, typically it would be along the entire frontage of the property, which Winding Creek extends from the southern end to the northern end of the property through the entire length. What you're looking at as far as the upgrade would be wider shoulders... I think I said that already... wider shoulders and sidewalk and...

Mr. Rhodes: Curb and gutter?

Ms. Baker: Was I missing something there? But basically widening it out to allow more travel lanes, wider travel lanes.

Mr. Apicella: And how much wider? I don't know what it is currently but, in terms of feet?

Ms. Baker: I'd have to look back at the information submitted and answer that for you.

Mr. Apicella: Okay, thanks.

Ms. Baker: If you give me a few minutes, I can do that.

Mr. Apicella: Any questions for staff?

Mr. Rhodes: Do we have an estimation of how much something like that costs? With that recommendation, how much?

Ms. Baker: I'm not certain that there has been any cost estimate done.

Mr. Apicella: Other questions? Mr. Coen?

Mr. Coen: Mr. Apicella brought up the idea of proffering it for recreation and if it wasn't wanted by the County for recreation, then it goes back. Is it feasible or possible for that to be recreation or for a conservation easement? Because can't the County own a conservation easement if the... you raised a possibility that the HOA may not be able to do that. Can the County do that?

Ms. Baker: The County is a qualified easement holder. The Board would certainly have to determine if it's a property that they would entertain holding an easement on because there are certain requirements such as annual monitoring and if trees fall across the road, it's up to the County to go and do that.

Mr. Coen: Right.

Ms. Baker: But there are other entities that could be entertained.

Mr. Coen: Okay, thank you.

Mr. Apicella: Other questions? Okay, seeing none, would the applicant come forward?

Ms. Baker: And just before I leave, there is a diagram in the staff report that shows what the widths of the lanes and shoulders may be for the upgrades along Winding Creek Road. That's on page 7 of your report.

Mr. Apicella: Thank you.

Ms. Baker: I didn't have that on the slides.

Mr. Payne: Chairman Apicella and other members of the Planning Commission, my name is Charlie Payne with the law firm Hirschler Fleischer and we represent the applicant. Thank you for your time this evening. I haven't seen you in a bit. Hope you all had a nice summer. It's always a pleasure to be here. This project's not new to you; at least not to most of you. Mrs. Vanuch was not on the Planning Commission when we last presented this to the Planning Commission last July/August of 2015. Staff has given you sort of the history. From there it went to the Board of Supervisors in September where it was denied 4-3, mainly in our interpretation on the connection to Fireberry Boulevard. The adjoining neighbors at Autumn Ridge were very concerned about that and the impacts to their development. Of course, our hands were a little tied because VDOT was requiring us to do it. After the denial, we went kind of back to the drawing board if you will and talked to VDOT about how we could find a solution to this, obviously also working with the community; it wasn't just isolated. So we were very transparent about how that process would play out. I know I participated in one community meeting; met neighbors individually and otherwise to assure them that we've resolved that issue, that the connection to Fireberry Boulevard is no longer required, which is why the 1.9 acres is not part of the project. That was the link, if

you will, that required the connection. So just to catch you up to kind of where we are. In regards to... and I appreciate staff's presentation; they've covered a lot of bases and I just want to reiterate a couple of points in regards to the application and kind of some reminders of why we structured the proffers the way that we did and why they're presented this way this evening. As staff had noted, obviously this project does bisect two districts, both Rock Hill and Garrisonville. On the Rock Hill side, there's about approximately 11 acres that's going to be undeveloped. I know there's been some questions about if the County doesn't accept it as park land, could we put a conservation easement on it. We're absolutely open to that. One of the challenges to a conservation easement is that the easement holder is willing to accept it and to maintain it. So, if we're unable to find a holder, whether it's the County or Virginia Outdoor Foundation or some other group, what we'll do is we'll encumber it into perpetuity that it can't be developed. So that will be... that is part of our proffer. Mr. Apicella had asked that question in following through the proffer statement if you go from 5 to 7, you'll see that there's a preservation requirement in our covenants that we'll have to provide to assure that. So, that's why it doesn't say conservation easement or park. It's just we would provide a conservation easement as long as the easement holder would accept it. As staff had noted, the project is consistent with the Comprehensive Plan. Overall, this is a very low density project in comparison to the Comprehensive Plan which encourages 3 units to an acre. This is at 1.58. We've preserved 54% of the property in regards to open space which far exceeds the requirements of 30% for cluster developments. I know in the past this Planning Commission has been concerned about what cluster developments should look like. I think this is a very good model for how that should look. In regards to the other open space, the 1.9 acres which had been concern for the connection which is not part of the application, that too will be put into a conservation easement. But the same sort of rule if we can't find a holder, it will be... there will be a covenant that prohibits any development into perpetuity. In regards to fiscal impacts, the analysis that we had done and continue to support is that the project will generate positive revenue. In the sense of operating revenue it will more than pay for itself, both onsite and offsite impacts. Staff has discussed what the school generation numbers will be. We are proffering over \$16,000 a unit; that's if you apply it across 97 units. If you just took out 20 units, which would be the by-right units, we're at close to \$21,000 a unit, which is very consistent with the guidelines from before, from 2015 guidelines. We discussed... staff had presented what our architectural features will look like and it's very consistent with prior projects that have been approved by the County. It's high quality to ensure high value which will obviously be very positive from a tax revenue perspective. Just from a transportation perspective, I'd like to kind of walk through that process as well. We are dedicating right-of-way along Winding Creek for future expansion. The staff recommendation regarding the collector road construction, remember, we're only talking about a portion of a segment of that road. And it would not include the improvements to the north of the site, which seem to be the issue with many drivers on Winding Creek which is the big turn that we have proffered... I have it here on the computer, computer please. Just to show you real quickly and you should have copies of those diagrams of what it looks like now. And this is what it looks like now. And Kathy, how do I get to the next one? Thank you. And this is what it'll look like after the improvement. So, you'll see an extensive site line opening here that will clearly allow drivers to see further down the road than they are today. So, again, if we were required to put improvements for the collector road, which hasn't been designed or planned for and it's not in the County's 10-year CIP, so we're not sure when the rest would ever be improved. This to us is a much, is a greater benefit for the community, certainly in the near term. And let's not forget, we do have 200-foot taper lanes, right-turn lanes into the site, and on both the north and the south side. So it's just not going to be simply coming off the road; you'll have the taper lanes getting into the area as well. And again, these improvements have to be made in the beginning, the first phase of the development. So this is not going to be down the road. We're proffered to do this up The other improvements that are proposed are the... at the intersection of Eustace and front. Northampton Boulevard, which was part of our TIA. I think it's important to note that the TIA was not

required, but we did do it and we did update it without the connection to Fireberry Boulevard. There was no recommendations for any other changes. Based on that, the Level of Services along Winding Creek will stay A or B which is very good, and will improve the Level of Services at the intersection of Eustace and Northampton. The overall improvements that we're proposing from a transportation perspective would be about \$819,000, including the right-of-way dedication. But most of that is going to be on the site line improvements that we'd have to make, again, having to work with third parties. If we're unable to get approval of those third parties, although we've had preliminary discussions, we think they're very positive in that regard, that money reverts to cash. So, it doesn't go away. So there's still... there's about a million dollars total... actually there's a total of a million dollars proffer for transportation on this project, even though our TIA did not recommend any improvements. Again, for purposes of schools, it's 1.6 million dollars total being proffered, which we just went through those numbers per unit, about \$17,000 per unit for 97, almost \$21,000 per unit for if it was by-right. There are some Park and Rec cash proffers as well, about \$150,000; libraries; Fire and Rescue; and general government. All total in cash proffers were about \$2.189 million, which comes out about \$22,571.73 per unit for 97 units, about \$28,434.52 per unit for 77 units, which was taking out the by-right number. Again, that number could change. It could go up, not down, if we're unable to get an agreement from parties to the north of us. The in-kind proffers come out to about \$1.7 million. So the total all in is about \$3.9 million, which is a very large proffer package. I think probably one of the largest ones that the County has had presented to it as suggested last time in our last presentation to the County in this regard. All in basically for in-kind and cash comes out to about \$40,437.77 for 97 units and about \$50,941 for 77 units; which again, backing out the 20 by-right units and doing that analysis. Again, I think some of the (inaudible) key comments I'd like to reiterate. Again, after last September, we kind of went back to the drawing board. We did reach out to the community. We went back to VDOT, said we've got to find a way to resolve this. We did, and we resolved the Fireberry Boulevard connection which was the big issue for many, for the folks who came out to speak. We are dedicating right-of-way for the improvements and providing transportation proffers even though our TIA said we didn't have to. When I say that I think the proffers will benefit the entire community, including this project. And we have provided proffers, significant proffers for schools to address those impacts. I think some of the highest per unit proffers probably this Planning Commission has seen for schools. With that, I'm happy to answer any questions you may have and I appreciate your time this evening.

Mr. Apicella: Thank you Mr. Payne. Any questions?

Mr. Rhodes: Yes, Mr. Chairman.

Mr. Apicella: Mr. Rhodes?

Mr. Rhodes: Mr. Payne, I do have a question but I did want to comment that very appreciative of the offsite effort; that certainly has been an issue and a concern for so many in the entire area. So, something to try and attempt to address that curve in the stone that's in there is certainly a tremendous add to the proposal. So thank you for the consideration from the offsite for the area. But I did have one small question. The pavilion -- the tot lot and the pavilion, nice added features for the community. The tot lot very obviously and apparently accessible. The pavilion -- what's the vision there to get to that pavilion?

Mr. Payne: I'm sorry, I just want to make sure I don't forget this. Let me see if I can... Mark, you want to address that?

Mr. Rhodes: Computer please.

Mr. Payne: Mark King from Bowman Consulting.

Mr. Rhodes: Yeah, but we'll need the mic just for the vast television audience.

Mr. Apicella: That's millions and millions Mr. Rhodes.

Mr. Rhodes: That's right. Competing with the debate numbers.

Mr. King: I'm Mark King with Bowman Consulting. What we'd be looking at, Mr. Rhodes, if... Kathy, I'm going to blow this machine up because I'm terrible with computers. Does this work? Well, something was working there a second ago. There's an access point... if you go from the top of the page down from the first circle, there's an access point right there. You just passed it Jeff, one more. There's a place to be able to get in there.

Mr. Rhodes: So, where he's at right now, the cursor, is it that one and below it, just a little...?

Mr. King: Yes, enough to be able to put like a trail, some type of a trail in there for the pavilion for people to access it.

Mr. Rhodes: Alright. Okay, I just saw it out there; I couldn't figure out how they were getting there. Thank you.

Mr. Apicella: Other questions?

Mr. King: Mr. Rhodes, there's also an access point... they just took it down off the computer... the two cul-de-sacs? There's an access point right there as well.

Mr. Rhodes: Hmm. Okay. Thank you. Thank you Mr. Chairman.

Mr. Apicella: Mr. Coen, you look like you have a question.

Mr. Coen: Well, I'm just looking at the nice map we got -- you might as well stay up dude. So, I'm gathering, even though it's not on the GDP, it's between maybe lots 68/67 or 67/56 that there would be some sort of path that would go by into there?

Mr. King: Yes, yes sir.

Mr. Apicella: Other questions? Mrs. Bailey?

Mrs. Bailey: Mr. Payne, back to the question that I had about the VEPCO easement disclosure. Will that... can you put verbiage in the HOA documents?

Mr. Payne: Yes. Typically, it would be and we can do that; not a problem.

Mrs. Bailey: Okay, just want to make sure it's covered. Thank you.

Mr. Payne: Yes ma'am, we can do that.

Mr. Apicella: Anyone else? Okay, seeing no further questions, thank you Mr. Payne.

Mr. Payne: Thank you Mr. Chairman.

Mr. Apicella: I'll now open the public hearing on these matters, items 1 and 2, Winding Creek Reclassification and CUP. This is an opportunity for the public to comment. Please direct your comments to the Planning Commission as a whole, not to any specific member. You have up to 3 minutes to speak. When you come forward, please state your name and address. The yellow light indicates you have 1 minute left. The red light means you need to quickly wrap up your comments. So, if anyone would like to come forward and speak, please do so. Okay, seeing no one coming...

Mr. Coen: Oh, she's waving now.

Mr. Apicella: Okay. I missed the wave.

Ms. Sykes: Good evening, my name is Stacey Sykes. I live in Autumn Ridge. And I still have concerns about this development. I was here last year when you guys were first presented it. My kids go to Winding Creek School, and even though they are proposing only so many kids to be there, that's going to be 4-bedroom houses. And I can't see that there would be just one child per house. So my kids are crammed in with over 25 kids in each classroom. And if you talk to the Winding Creek staff, they're overwhelmed. So my concern is even though they have done a great job of redesigning and they've heard our pleas, I still have concerns about the capacity for our schools to be able to handle the volume of kids that are coming with all the other new developments that are in our area zoned for Winding Creek School. The other thing I'd ask you to look at is I'd ask you to drive Winding Creek Road. Because even though they're going to go ahead and blow that rock off, and I applaud them for doing that and I also recognize that they've worked hard to have that accomplished, I still think that has a deadly turn. And even though you can see the cars coming, that turn whips around and then it's icy, it is icy. And I drive that road every single day. So I challenge you to go drive it. The other thing I'd ask you to go do is look at it tomorrow, because it often floods and they put signs up it's flooded. So, although I know they've made some great changes and tried to accommodate our concerns, I still think that this project still... I have some great reservations about it. And I ask you to just kind of drive that road, think about our schools, think about our kids in that school, because it does impact my kids and all the kids in our community. Thank you.

Mr. Apicella: Thank you. Anyone else? Okay, I'll close the public comment portion on these matters. Mr. Payne, do you have anything else to add?

Mr. Payne: Mr. Chairman, I appreciate the opportunity to just make another comment. We appreciate obviously our neighbors' concerns and appreciate their comments. And we've endeavored I think for an extensive period of time to address all those issues, including transportation and schools. If you look at our proffers, they're very high. And the high end I think for applicants that you've had before you in the past, and likely into the future. The transportation improvements I think will have a significant benefit to drivers along Winding Creek. If you look at the stretch of our site, that stretch is fairly straight without a curve, without a lot of turning, and we do have tapers. So we don't want folks to think that we're just going to be diving into the site. So there will be 200-foot tapers to our entrance and a right-turn lane to the south and likewise to the north. So anyways, I just wanted to add that that we have addressed those concerns, at least to the extent the best we can. Not everything's a perfect fix, but I think we've come a very long way to address many of those issues. I'm happy to answer any questions you may have.

Mr. Apicella: Any further questions? Okay, thank you. Oh, Mr. Coen?

Mr. Coen: I just remember when it was here before we went around and around and around a cul-de-sac, or a roundabout with the whole Fireberry. And it, I mean, it seemed as though it was adamant; we had to do it, VDOT was forcing us. I mean, it was adamant. And so I'm sort of surprised that now it's like VDOT's like, yeah, okay, don't need it. So I just want to make sure, so people understand, you know, why it sort of dropped and is it never ever, ever going to be you know brought back in a TRC where the public isn't going to be able to have an input.

Mr. Payne: I think it's a really good question and fair question. If I can have the computer and, since I can't move anything around, Mr. Harvey, if you could show the general area where that connection would be on Fireberry Boulevard. It's to the east of the site. You see there's a strip of land, about 1.9 acres... excuse me, I'm losing my voice a little bit... but it's about 1.9 acres that was part of the prior application. This triggered the connection. You see Fireberry Boulevard here. You'll see how we've T'd the houses there. And on top of the fact that we can't include those in our proffer statement because it would be part of the application, but the plan is to put that 1.9 acres in a conservation easement because we will only control it. But we've T'd it there so there's no way to connect into the future. So we'd actually have to come back to you to get a proffer amendment to allow us to connect, and to also to redevelop that 1.9 acres as well. So, I think we've got layers and layers and layers of assurances here that that's not going to happen. And believe me, we don't want to go back there. I think we've addressed that issue. Thank you.

Mr. Apicella: Thank you Mr. Payne.

Mr. Payne: Thank you; I appreciate it.

Mr. Apicella: Okay, I'll bring this matter back to the Commission. Mr. Rhodes?

Mr. Rhodes: Mr. Chairman, I did have one question for staff just to confirm.

Mr. Apicella: Okay.

Mr. Rhodes: With the 1.9 out so that it wasn't abutting the subdivision any longer, where would the notifications for public hearing... where did they end up going to? Did they still go to the HOA and to the other...?

Ms. Baker: Let me look back in our application. It would be any property that's immediately abutting the boundary line.

Mr. Rhodes: Yeah, now that we dropped that one, I'm just trying to recall what is now abutting since we dropped that one parcel that was the impact to the inter-parcel connector.

Ms. Baker: I'll have to look it up for you and see.

Mr. Rhodes: Thank you.

Mr. Apicella: Mr. Coen?

Mr. Coen: And then I'm just curious. We had a good number of people come out to speak. Did we reach out to them? Because I remember there was the Fireberry, but there also were a number of people who just were talking about the traffic on Winding Creek, as the nice lady tonight was talking about. So, did we reach out to them to say hey, by the way, this is coming back up again just to let you know?

Ms. Baker: No, other than posting the signs on the property. We had 3 signs posted along the right-of-way frontages and the notifications and the advertisement in the newspaper.

Mr. Coen: Okay.

Ms. Baker: I understand they had a public information meeting, the applicant did back in April.

Mr. Coen: Okay.

Mr. Apicella: Do you want to come forward? Did you get any comments at that, or can you summarize the comments that you got?

Mr. Payne: Again, Mr. Chairman, Charlie Payne with the law firm Hirschler Fleischer; I represent the applicant. We did have the public information meeting back in April. It included many of the residents who were at obviously the last public hearings. The main issues that were discussed were obviously the Fireberry Boulevard connection; those were the main issues that were discussed. You know, schools were a question as well. We were at Winding Creek Elementary so there were some school questions. But typically that was the main issue.

Mr. Apicella: Okay, thank you.

Mr. Payne: Thank you.

Mr. Apicella: Okay, again, bringing this back to the Commission. Mrs. Vanuch, Mr. Rhodes, it's in your districts. How would you like to proceed?

Mrs. Vanuch: So, I'm not sure that this is really a question, but I just read recently, a couple days ago, an article in the Free Lance-Star of the overcrowding at Colonial Forge. And, you know, as I'm looking at the numbers of the school students, even as the woman pointed out, I think I would like some time to kind of meet with staff and discuss the school numbers and how we came up with the 1.3 per household. I agree that 4 bedrooms is probably not realistic to account for 1. -- I don't know how you have a .3 child, maybe a niece or a nephew -- to account for 1.3 students per house. I think the new development numbers of around 130 students is probably more realistic. And when you look at the numbers just at Colonial Forge alone, I think they're over capacity by 153 is the current numbers. So, that's very concerning. And when I look at that and then I add it onto the new proffer legislation, and I think okay, if this neighborhood or this development is approved, it sits here for two or three years and then we do end up having open seats or no burden on transportation because it's not been developed yet but it's in queue to be developed. How will that impact the additional developments coming forward to the Commission where those... the residents that aren't there yet are occupying... are not occupying the seats in the schools and transportation and public safety? So, I personally would like some time to kind of research that and really make it a much better advised decision before just accepting these numbers and moving forward.

Mr. Apicella: So, was that a motion to defer, Mrs. Vanuch, with some commentary associated with it?

Mrs. Vanuch: Yeah, with a lot of commentary. I think that would be my motion, but I also want to give Commissioner Rhodes an opportunity to comment to.

Mr. Apicella: Well, you made a motion, I think...

Mr. Rhodes: Second.

Mr. Apicella: Is there a second?

Mr. Rhodes: Second.

Mr. Apicella: Okay. Motion to defer, it's been seconded. Do you have anything else to add Mrs. Vanuch?

Mrs. Vanuch: That's it.

Mr. Apicella: Mr. Rhodes?

Mr. Rhodes: I would just submit that, I mean, we've got a very comprehensive package, and thank you, but boy was it comprehensive. And so I don't know that I went through every single part of it, because I'm still downloading some of it I think. But it was a very good package. So, waiting till the next meeting I think is good just to make sure we're understanding the implications and the other elements of we've always wrestled with some of the student numbers. And I think it's good to know on the capacity on Winding Creek on others, so I support the effort to make sure we're comfortable on those pieces. I will submit that I think they did a fairly good job; there's never a perfect package, but they did a fairly good job of building on the strengths, the positive parts of the last application and addressed... working to address further. I am exceptionally pleased by the couple of offsite improvements, so leveraging those, particularly there on the Winding Creek corner. I mean, that has been something that has been a concern of people; I go by that road every day as well. I mean, that's just one of the most horrible features sticking out on that road anywhere. And it is a heavily used road; it's not like it's on the way back corner road, it's a heavily used road. So, something to actually get that done and addressed is a tremendous plus, and so I appreciate the consideration of that in this package. And that, I recall, was a lot of the commentary last time and then the other was the inter-parcel connector. And with the reconfiguration, removing the small rectangular lot from the application, I mean, it precludes that one in the process as well. So I think it's certainly gone a lot further. And we're not having ones that are going to be bringing money in on proffers much anymore. So, those are all pluses, but I think it's worth just taking a little time to make sure we're comfortable, we've not left anything on the table. Thank you Mr. Chairman.

Mr. Apicella: Thank you Mr. Rhodes. Any other comments on the motion to defer items 1 and 2?

Mr. Coen: If I may sir.

Mr. Apicella: Mr. Coen?

Mr. Coen: If staff could also contact the Sheriff's office for information and statistics on accidents and etcetera on that, particularly that swath of road, that might be helpful. While I appreciate that there was a

public meeting in April, that was a long time ago. I mean, that was two conventions, one debate, and several primaries ago. So I think it would be nice if we would reach out to the people who spoke at our meeting and at the Supervisors' meeting and let's let them know that this was coming back up again. If it's just a matter of postage, I'm sure, you know, some of us could help or I would help with that aspect. I also... it might be useful to reach out to the school system; ask the Chair of the School Board their feeling about this as far as since they're closer to the impact of these bodies. I'm really interested, as Mr. Apicella pointed out, about the real student generation, the numbers, because that sort of is a difference and that's a significant difference. And I think if the methodology of the County went to develop that number as the one they felt more comfortable with, I think that may be a better one to look at it. And so I'm not sure whether that just one meeting is good. I don't know if the people who made the motion want to go to the second meeting, you know, two meetings from now rather than the next meeting. And then also maybe talk to Parks and see if they're actually interested in that land. That might give the applicant some idea of whether or not which road to go on or which path to go on to how to deal with that parcel of land, if Parks is pretty clear they don't think so. If memory serves me from our sort of meeting with VDOT, they're stopping their widening which includes sidewalks at Winding Creek. So therefore anybody farther than that would not be able to use that park because there's no sidewalk unless you're going to have them walking on Courthouse Road to try to get there.

Mr. Rhodes: Well, they're not doing an improvement all the way up Winding Creek either.

Mr. Coen: That's right, yeah. So, it just would... maybe it just isn't a feasible thing to put a park in that parcel, and it would be good to know that sort of ahead of time. So, those are sort of my concerns about that. And just as an aside, it's interesting, if we use the by-right, that's only 20 homes, period. So it's always weird to say well, it's going to be 97 but we'll take out 20 for whatever. If we didn't do 97, it only would be 20. So, I always just find that an interesting dichotomy there.

Mr. Apicella: Thank you Mr. Coen. Will you accept it as a friendly amendment to postpone this or defer it until the second meeting in October, Mrs. Vanuch?

Mrs. Vanuch: I'm good with that.

Mr. Apicella: Mr. Rhodes?

Mr. Rhodes: I guess so. I would just share that Ms. McClendon was able to find that they did notify for the public hearing all the surrounding HOA associations, so Park Ridge, Berkshire, and the others. So they were contacted. I thought I recalled from the last time that Parks was asked about this and they weren't really interested in that little sliver of land for a park that it's not really usable for that purpose and function. And I think all the packets from the public hearing do go to the schools, so they do have the opportunity to look at these, but double-checking on numbers is fine. I just don't know that it'll take that long but, if that's what we need to do, that's fine too.

Mr. Apicella: Okay, I would just also ask that in the language regarding the transfer of the property to the HOA, in the absence of the County wanting that parcel, if we could somehow... if you could somehow strengthen the language to make it clear that there will be no development or sale of that property, and/or to allow it to be put under a conservation easement. Again, I don't know what the right language would be, but I just kind of threw it out there. So, there's a motion to defer until the second meeting in October, which I believe is the 26<sup>th</sup>, please cast your votes. Okay, the motion carries... I'm trying to count my numbers here... 6 with 1 abstention (*Mr. English abstained*). Okay, thank you.

- 3. <u>RC16151333; Reclassification Winding Creek</u> A proposed reclassification from the A-1, Agricultural Zoning District to the R-1, Suburban Residential Zoning District, to allow for a greater density, single-family detached dwelling unit subdivision, of up to 97 units, to be developed on Tax Map Parcel No. 29-4. The property consists of 61.23 acres; is located at the intersection of Winding Creek Road and Embrey Mill Road, within the Garrisonville and Rock Hill Election Districts; and is concurrently under consideration for a conditional use permit to allow a greater density cluster subdivision in the R-1 Zoning District. (**Time Limit: January 6, 2017**) (**History: Deferred on September 28, 2016 to October 26, 2016**)
- 4. <u>CUP16151334; Conditional Use Permit Winding Creek</u> A request for a Conditional Use Permit (CUP) to allow a cluster subdivision of up to 2.25 dwelling units per acre on Tax Map Parcel No. 29-4, which is concurrently under consideration for a reclassification from the A-1, Agricultural Zoning District to the R-1, Suburban Residential Zoning District. The property consists of 61.23 acres, located at the intersection of Winding Creek Road and Embrey Mill Road, within the Garrisonville and Rock Hill Election Districts. (Time Limit: January 6, 2017) (History: Deferred on September 28, 2016 to October 26, 2016)

Ms. Baker: And I will note I will be discussing item 3 and 4 together, which is the reclassification as well as the conditional use permit. So, these applications for Winding Creek went to public hearing on September the 28<sup>th</sup>. And just to recap, the request is to reclassify the property from A-1, Agricultural to R-1, Suburban Residential, and the conditional use permit is for a cluster subdivision with an increased density. This is just an overview of the property again, with Winding Creek Road generally through the... bisecting the parcels and Embrey Mill to the bottom of your screen. And this was the proposed Generalized Development Plan for 97 single-family lots with two entrances on Winding Creek Road. To the top of the screen you see approximately 11-acre parcel that would be dedicated for open space. At your public hearing, there were several issues raised by the Commission that staff went back to provide information for. And that included providing further information on potential school impacts, and I'll get into a little bit more specifics on the next couple of slides. Also, the request to obtain accident reports from the Sheriff's Office on Winding Creek Road, specifically focusing on the area of the... in front of the proposed site. But we also obtained the information for the entire length of Winding Creek Road, knowing that that was some information that the public spoke about. We were also requested to show a comparison of the Comprehensive Plan typical section of what would be required for upgrades to Winding Creek Road versus your existing road. Also, to provide more information for the proposed park site or open space area, and then to reach out to speakers for the prior application. With regard to that, I will note that we went back to the 2014 and '15 public hearings we found the speakers that spoke at those meetings and we did send out notification letters I'm going to say last week -- I don't remember the exact date -- just to let them know of the meeting tonight, that the public hearing was held, and provided them where they could find more information on the application. So, with regard to some of the school information, you did request that we provide the current enrollment of the three schools impacted by this proposal, which is Winding Creek Elementary School, Rodney Thompson Middle School, and Colonial Forge High School. At your last meeting we showed the projected forecast and then we reached out to the schools to see if they had updated numbers based on actual enrollment. So you see the comparison specifically in this column. And this column the enrollment, actual enrollment for Winding Creek is actually a little bit lower than initially anticipated in being forecast. Rodney Thompson was higher, as well as Colonial Forge. So in the fourth column you'll see the percent capacity of each of those schools, and then available seats left. And this information was in your report.

Mr. Apicella: Mr. Coen?

Mr. Coen: I'm just curious, Ms. Baker. Have we received, and I think I mentioned it to Mr. Harvey in my email, have we received up-to-date numbers? I mean, these are the projections. Have we... I know that the school system, and Mr. Apicella served on the same committee I did at one time where they had up-to-date numbers of actual enrollment. Did we get any current numbers?

Ms. Baker: This third column shows current as of two weeks ago.

Mr. Coen: Okay.

Ms. Baker: We didn't update it today, but that was what the school provided after the actual enrollment at the beginning of the school year. The forecast numbers were from I want to say July. The Commission had also asked to compare the countywide average of student generation rate versus the new neighborhood average. And just for some background on that, staff right now uses the countywide average of .66 for single-family. The new neighborhood average is the average of .96 which was discussed back in 2015 with regard to updating proffer guidelines. That number has never been officially adopted; it's not a policy that we use, so we still do go with the .66 rate which is the countywide average. But we did, however, provide the comparisons for that which you can see on this chart; the total student generation of 64, which breaks out across the three different levels of school, and then compared to the new neighborhood average of 93 students, broken out by school level. You had also asked us to project out how many students per year, based on this application, and based on information provided by the applicant that said that they would likely be built out between 5 and 8 years. We kind of took that timeframe and estimated from 2020 through 2024 what your total student generation rate by year, by school is. And you can see on these two charts, again the countywide average at the top and the new neighborhood average at the bottom. And these charts were also included in your reports. One more note on the schools -- you did ask us to reach out to Holly Hazard, the Chairman of the School Board. We did send a letter to her... or excuse me, an email. She did respond to us that she nor the School Board was actually taking a formal action or recommendation on this report, but leaving it to the school staff if they had any additional comments. You'd also asked us to reach out, as I said, for the accident report. And keeping specific to the section of Winding Creek Road on this slide, between Embrey Mill Road and the Flatford Road intersection, there was a total of 28 accidents over a 6-year period going back to 2010. This includes 13 accidents at the intersection of Winding Creek Road and Flatford Road/Walpole Street, which is a four-way intersection. There were 12 over the 6-year period at the intersection of Winding Creek and Embrey Mill Road. And 3 actually between Flatford Road/Walpole Street and Embrey Mill Road, which does include the frontage of this property. The full accident report over those 6 years for the entire length of Winding Creek Road was submitted in your report. With regard to the Comprehensive Plan street section, this does show the urban 2-lane major local standard of having a 60-foot right-of-way, which the applicant is dedicating right-of-way for this project. The proposal would be to have two 11foot travel lanes with 6-foot shoulders. The alternative, if you were providing sidewalk, would be to have a 5-foot shoulder with a 4-foot buffer area and a 5-foot sidewalk. As that compares to what's existing out there, you basically have two existing 11-foot travel lanes with 22 feet of pavement width total, you have no paved shoulders, and there's no sidewalks. So, that's how it compares. And then with regard to the open space site which is the area I've zoomed in on here at the top of the screen, we did reach out to the Parks and Rec staff. I didn't note in the previous report that we had reached out for the prior application and indicated under the former Parks and Rec Director that they would not likely accept this site as a County park site. And the maintenance would be difficult if it were just left in open space because it's treed. They would have to take into consideration if trees fell on the road or onto neighboring properties, how to maintain that. So, at the time, they indicated there wasn't a need or desire to own the property or

take it on as a County school... park site. Not a school site, a park site. We did reach out to the current acting Director of Parks and Rec and he basically concurred with that assessment. You'd also asked about any additional access that could be provided and that would be up to whoever might take ownership in the long run of this property, or if it remains with the Homeowner's Association whether additional infrastructure such as a separate parking area could be provided on the west side of the road. Sorry, one thing I did not mention on this was the proffer that the applicant has revised indicating how would be... they've strengthened the language to ensure that it would be retained as open space. And the potential for a conservation easement would be considered. So just to recap, that staff is recommending approval of both the reclassification and the conditional use permit. We do still recommend that the applicant consider the urban 2-lane major local standard upgrade to Winding Creek Road in the vicinity in front of the site. I'll be happy to answer any questions. I have additional graphics or anything that you need (inaudible).

Mr. Apicella: Questions for staff? Mrs. Vanuch?

Mrs. Vanuch: (Inaudible - microphone not on). Notification process; I got a couple of inquiries in my district that they were not notified.

Mr. Harvey: Yes ma'am. The adjacent property owners, including those across the street, would be notified. That's what the Ordinance requires. So that's who we sent the notice to. That included open space parcels for both those neighborhoods, so the HOAs were notified.

Mrs. Vanuch: Okay. And do we send it by certified mail? What is our current requirement for the County? Do we send it by certified mail (inaudible - microphone not on)? Mr. Harvey: We send them by certified, yes.

Mrs. Vanuch: Yes. Do we have a copy of the certified letter that was signed (inaudible) HOA?

Ms. Baker: We don't necessarily receive a letter from them.

Mr. Harvey: Yes. We send them certified but not return receipt certified.

Ms. Baker: Correct.

Mrs. Vanuch: So, in the future, is there anything you can do (inaudible - microphone not on) just to ensure that the HOAs are receiving them and can verify that they have received them? Because in spite of this (inaudible - microphone not on) residents came forward and said that their HOA had not been notified in that time. So, again, we can't control what happens with the HOA and how they fill their notification processes. However, I believe we should be able to prove that they did in fact receive a copy of the notification so that we can share that with residents so that they... that the County can have that proof. And I just have a really hard time without having that proof when a resident comes to me and says that they... their neighborhood is saying that they didn't reply, that there are several neighbors who want to be able to reach out but they didn't find out about it until after the public hearing was already (inaudible - microphone not on) at the very beginning of this particular meeting on Winding Creek because (inaudible - microphone not on) other things that we can do for that because I feel like it's not (inaudible - microphone not on) ample time to (inaudible - microphone not on).

Ms. Baker: I'm going to just have to take time to look at the Ordinance and what's...

# Page 3 of 18

Mr. Harvey: Yes, it adds additional cost to the notification process. But the code does not require verification that the person sign for it, because often times with certified receipts, people won't sign for them because they're concerned it's some collection agency or whatever.

Mrs. Vanuch: (Inaudible - microphone not on).

Mr. Rhodes: Actually, if they're not home, it doesn't... you know.

Mr. English: I think what if we just sent it and maybe I'm not hearing you right, but could we just send it directly to the HOA President and then it'd be up to them to get the information out, for the certified part of it, for the signed, that way you would only do one certified and return receipt...

Mrs. Vanuch: Yeah, just to the HOA (inaudible).

Mr. English: ... just to the HOA President of each organization, that way you're not sending a thousand of these out.

Mrs. Vanuch: Or the management company or something. Or putting the sign out by the neighborhood or something because this is kind of common themed where the HOAs don't notify the residents. You know, we can argue all day long that that's the HOAs fault (inaudible - microphone not on), but I feel that (inaudible - microphone not on) our residents that what we're doing isn't working. We need to do something maybe a little bit differently. So, I would even encourage us to put a sign out (inaudible - microphone not on) hearing (inaudible - microphone not on). Just say hey, there's a public hearing on the neighborhood (inaudible - microphone not on).

Mr. Rhodes: You need a permit for that.

Ms. Baker: We post signs on the property frontage.

Mrs. Vanuch: But if it's not something (inaudible - microphone not on). Like I know with my house, it's in the backside of the neighborhood. I would never drive down that road and so I would never see the sign; but I drive up and down 610 all the time. (Inaudible - microphone not on), I think in the future we should look at that.

Mr. Apicella: Mrs. Vanuch and other members of the Commission, Mr. Rhodes will remember this. There was a point in time when we talked about setting up a subcommittee to look at noticed requirements. It never really went anywhere. That's probably something we could revisit. Probably now is not the best time to do it, but that might be something we want to talk about at a future meeting. So, is that okay?

Mrs. Vanuch: That is fine. So that is the one thing that I just wanted to mention. And I don't want to derail this conversation today; I know we probably have a lot of other questions, but I feel very strongly because there are several residents in my district who feel they did not have the opportunity to come and speak. And I spoke to Mr. Harvey about possibly creating a new public hearing process for this particular development and there is a path forward. We could re-advertise, we can rehear this and have a public hearing a vote on it at the very beginning of December. That is a possibility. And, you know, I'm not going to make a motion yet because I want everybody to be able to ask their questions on this particular issue, but I feel very strongly about we should be able to re-notify the residents, especially the people who

spoke at the previous meetings because we didn't do that until after we had the public hearing... oh sorry (turned microphone on) so none of those people could talk. Don't make me repeat everything I just said.

Mr. Apicella: Start from the first word.

Mrs. Vanuch: I have no idea what I just said. So anyway, I'm just going to throw those comments out there. I want everybody to be able to ask their questions before I move forward.

Mr. Apicella: Okay, other questions?

Mr. Rhodes: Mr. Chairman?

Mr. Apicella: Mr. Rhodes?

Mr. Rhodes: If I could, Ms. Baker, so on the accident reports, the 143 accidents were from the beginning of 2010 through October 2016?

Ms. Baker: That's correct.

Mr. Rhodes: So, almost 7 years. And only three of those were, over those 7 years, were on the segment that has that corner that's always been of concern, right? I just want to make sure I understood that right.

Ms. Baker: Let me find my information.

Mr. Rhodes: That wasn't just for the latest year; that was for the entire 7 years? Ms. Baker: Over the entire 7 years...

Mr. Rhodes: You had one subset then you had another subset that talked about 28, we're on the segment between Embrey Mill and...

Ms. Baker: Correct, that was between the two intersections. And I can go to the screen...

Mr. Rhodes: Okay. But that's for the entire 7 years, not in a subset of.

Ms. Baker: Correct.

Mr. Rhodes: Okay. And the 25 were at the two intersections and three were between.

Ms. Baker: In between the two intersections, yes.

Mr. Rhodes: Okay. I just wanted to make sure I was understanding that correctly. Thank you. Thank you Mr. Chairman.

Mr. Apicella: Okay, any other questions for staff? Okay, seeing none, would the applicant like to come forward?

Mr. Payne: Mr. Chairman and other members of the Planning Commission, my name is Charlie Payne with the law firm Hirschler Fleischer and we represent the applicant. It's always a pleasure to be here before you and appreciate your time, appreciate staff's time. I know it's had a lot of information that was

## Page 5 of 18

put together for your presentation this evening, and we've also been going through; so it's been quite a bit of information to respond to so we want to do that as quickly as we can. I've got Mark King from Bowman Consulting here, as well as our engineer on the project to address any questions you may have. I'm going to reiterate and sort of clarify a little bit of the crash data that was presented. I think Mr. Rhodes correctly identified the fact that it's fairly modest crash activity between the two intersections, most of it occurring at the intersections, whether all four-way stop signs and other traffic modes of control. And just on the traffic component, I think it's first important to just remind the Planning Commission that a Traffic Impact Analysis was performed in 2014. It was updated in 2016 and obviously approved by staff and also by VDOT, for purposes of the scoping. For purposes of that Traffic Impact Analysis, there were no recommendations for offsite improvements. Despite that recommendation, the application does provide in its proffers offsite improvements, including improving the site line north of the site where there is the curve that many have complained about in public hearings that would improve the site line. You've seen the before and after versions of that. We've also obviously proffered turn lanes and tapers into the site, both along Winding Creek. We've also proffered to improve the right-turn lane at And just for examples of all of that, including with or without our Eustace and Northampton. improvements, the Level of Services don't change with our project. They stay A or B along Winding Creek, which is very good. And the fact that we don't degrade the Level of Service is consistent with your Comprehensive Plan. In fact, at Eustace and Northampton, we improve that intersection from E to C even though we only contribute about 1% of the traffic there based on our traffic study. So, for folks to take the position or have the perception that somehow this project is going to cause more problems along Winding Creek is just simply inconsistent with the facts and the data. And, in fact, we went beyond the facts and data and saying we're not going to provide any improvements, we went ahead and provided about a million dollars' worth of improvements which we believe will not only benefit our project but also all of those traveling along Winding Creek. It's also important to know for purposes of the traffic component here that we've done the analysis for traffic accidents. The County does not have this in their 10-year plan for improvements and certainly not in the VDOT 6-year plan. So, even for purposes of the County, this is not per se a priority for improvements. Suggesting that we should improve our segment of Winding Creek to a 2-lane collective road with sidewalks, etcetera, when the County hasn't designed or funded the entire project, and doesn't appear it's going to do so anytime soon, just doesn't make a lot of sense. What seems to make more sense is to address the issue that is more concerning to the community, and that is the site line issue north of Winding... north of our site by about 6 or 800 feet, which we think will vastly improve traffic activity on that corridor. In regards to the school data, we always appreciate additional analysis. We also appreciate comments from the public in regards to concerns about overcapacity issues, in regards to concerns about where kids are going to school, attendance zones, etcetera. I think it's important to note that this is a fairly modest project. It is an infill project that's consistent with your Comprehensive Plan. This Planning Commission just diligently went through that exercise to amend the Comprehensive Plan, and for that purposes, identified and continue to identify this site as a Suburban district site. It's an infill project. We're surrounded by very similar uses; 300-plus units at Autumn Ridge, close to 80 units at Berkshire, etcetera. We are developing or planning to develop or propose developing 97. Given the current market, we think that build-out of that project will be 5 to 8 years at best. If you just take a look at a very similar project which is at Shelton Woods, which was approved in 2012 if my memory serves me, construction started about 2013; they've only got 20 homes in there today. It's a very similar home that's going to be constructed at this site. High end, 495/525 and up type of development. So, those homes do sell slower but they also provide a greater asset, a greater punch if you will for the tax base. As you know, and if you read from our analysis, they provide adequate tax base not only for the cost of operations from each unit, but they also have a surplus which benefits the entire community and helps subsidize some of the losses that we have on a per capita basis for operating costs in our County. In addition to that, folks who live there have disposable incomes. So they're going to attract more commercial enterprises, they're going to attract retail, restaurants, etcetera, which is a priority from

economic development perspective for our County. In addition to that, they're paying their share for potential impacts, even though I believe the analysis is fairly modest which was not only presented by us but also confirmed by staff. In that, we're paying \$17,000 a unit for schools over 1.6 million in addition to our other cash proffers. It's likely one of the highest cash proffers per unit for schools that's been before the Board. So I think that is something that we're very proud of and something I think addresses the concerns of the community. In regards to capacity issues at schools, it's not the developer's job to decide what school should be redistrict, when schools should be built. It's our job to address the analysis in regards to what the impact may be based on your guidelines and to provide and make a proffer, if you will, of how we think we can best address it. The public policy regarding redistricting is again beyond our pay scale, something we have little control over, and something that in my opinion should not be part of this application, respectfully. So, with that, I will move onto the next point. And parks, as you may recall, obviously the 11-acre site that is west of Winding Creek, part of this application, is proposed to be undeveloped. That was a desire of the leadership at the time when we moved forward with this application initially, it was the desire of the adjoining property owners and Berkshire and others, and what we were encouraged to do was leave it open for either active recreational space or passive, which we have done in our proffer statement. I noticed a comment from the Recreation Department. They were not interested in accepting it; for one reason, it's tough for them to maintain it and they've got to construct it and pay to do that. It's a resource issue, which we understand. The fact that there's a utility easement across there should not be an issue to deter or prohibit the use for recreational uses all the time. Those utilities were relocated and affects only about two-plus acres of the site; of course, that's close to 11 acres. We have, as an option, agreed if the County did not want to accept it for recreational purposes we would preserve it in perpetuity be undeveloped. I think fulfills the goals of the kind of leadership again that we were working with in the past, this Planning Commission, and also with the adjoining neighbors. In regards to notice, I do take exception if there is a desire to have another public hearing on this. I think that's inappropriate and unfair. This project has been before this Planning Commission more than just this time, and the public hearing process was quite extensive before. Not only were there public meetings prior to the application... I'm sorry, prior to the public hearing last year, after the first public hearing I recall that Mr. Gibbons asked that the public hearing remain open so that we can meet with folks at Berkshire and in his district; which we did at Hampton Oaks. I believe Mr. Rhodes was there, I know Mr. Gibbons was there, my clients were there, as well as staff. Thereafter, obviously there were several public hearings. The main issue at those public hearings, as many of you recall, were the residents at Autumn Ridge who were concerned about Fireberry connection. Basically, in our opinion the project was turned down for that reason. We went back to the drawing board, we desired to appease and address the issues of the community, fought very hard thereafter, had several community meetings with folks, including this past April. I know that I met with residents personally on Sunday afternoons to talk to them about their concerns to address this issue. And, in all fairness, there was one person who came and spoke out against the project at the last public hearing, and her concern was schools. And she, in fact, I thin commended us for the efforts that we had undertaken in regards to the Fireberry Boulevard connection and listening to the neighborhood. In regards to notice for purposes of the first public hearing, it was my understanding that the County did go above and beyond its current ordinance and policy and notified not only adjacent property owners, but also persons who spoke last year at the public hearings against or for the project. They were all notified is my understanding. Staff can correct me if I'm wrong but that's my understanding.

Mrs. Vanuch: Can I interject? Mr. Harvey, were they notified prior to the public hearing?

Mr. Harvey: Mrs. Vanuch, no they were not. They were notified of this meeting tonight.

Mrs. Vanuch: Okay.

Mr. Harvey: The additional notification was.

Mr. Payne: Prior to the first public hearing, it was my understanding that the County sent notices to all the residences in Autumn Ridge. Is that not correct?

Mr. Harvey: No sir.

Mr. Payne: Okay. I'm sorry. Just the HOA. Sorry. We also, prior to the public hearing -- and I apologize if I provided misinformation; I was informed that we did notify them. It's not our responsibility, by the way. Prior to the public hearing last September 28<sup>th</sup>, the President of Berkshire's HOA was here, Philip Canoyer. And he was here because I asked him to come because we had a discussion about the hearing going forward. In fact, we were in discussions with him last year, met with him last year in regards to the improvements at Winding Creek, north of our site as we had discussed earlier. So, this has been a very extensive public process. I think a very transparent one and one that we have reached out to the community extensively. So, to... no disrespect, but to suggest that we have not undertaken all efforts to try to accomplish that goal I think is unfair. In addition to that, there's going to be another public hearing process going forward at the Board of Supervisors which folks can come to and speak. And we're more than welcome to meet again with the Berkshire HOA to discuss the project, or any other HOA for that matter. So, with that I'm happy to answer any questions you may have. But I just wanted to make sure that we got that information out and filled some gaps and some questions that may be out there. Thank you Mr. Chairman.

Mr. Apicella: Questions for the applicant? Could you just refresh our memory -- give us the highlights of what's changed between the version that was approved by the Planning Commission, what, a year or two ago? Versus the version that's in front of us today.

Mr. Payne: The only major change that has occurred is the fact that we have removed... well, the 1.2-plus acres is not part of the rezoning application which required the connection to Fireberry Boulevard. That is the major change.

Mr. Apicella: Thank you.

Mr. Payne: And the most recent change is in regards to preserving the open space that you have requested.

Mr. Apicella: Right, thank you. Other questions? Mrs. Vanuch?

Mrs. Vanuch: I have a couple questions. So, help me understand the site line improvement from... on Winding Creek Road. How... what changes are you exactly going to make in order to improve the site line to you said 6 to 800 feet, if I'm correct?

Mr. Payne: The site is 800... 6 to 800 feet from us. So, what we'll be doing is improving the site line to the curve where the curve is. So you'll be able to see through the curve versus the wooded area blocking that turn. Do we have the slide? We have a before and after slide that may be very helpful. And Mark, do you want to come up and talk about the details as the engineer on the project? About what has to be done.

Mr. King: I'm Mark King with Bowman Consulting. I'm the Civil Engineer on this project. This curve that you're looking at here -- see how it kind of bends right to left. On the left-hand side there is a very

# Page 8 of 18

large exposed rock that's there. So, what we want to do is be able to help the driver as they navigate this turn to be able to see beyond those rocks. So, as Kathy just moved up here, we're going to lay that back. There'll be a small retaining wall. We need some property from Mr. Greg Henderson who we have met with and he has no problem with that. And what that does is you can see here; now as you're coming to that curve, you can see through all the way over to Flatford and Walpole Street, which is a four-way stop. So, that in my opinion really makes this area a much safer place, just not for our development, I think for the entire County and Mr. English especially if he has to respond to any accidents there. But I think it's significant. It's something that needed to be done years ago, probably even when Berkshire went in. But, you know, they don't have an access point on Winding Creek; it's both on Walpole Street.

Mrs. Vanuch: So, you said you have to obtain some property. And there are some contingencies in your proffer. So what happens if you can't get the... what happens if you can't do that?

Mr. Payne: So, we're not necessarily obtaining property. It's an easement. It'll be a site line easement and we'll landscape it if it's agreeable to all the parties. If we can't get the agreement of two parties, one of which will have to be the Berkshire HOA and the other will be Mr. Henderson, and Mr. Henderson's already given his permission. Berkshire gave us their OK last year; we want them to reiterate that again this year, that's why we're having a discussion with them. If we get one of two, then we would go ahead and make the improvements that we can to clear that area, and then the difference in cash would be paid in cash proffers. So, it's a million dollars total; the improvements just to this site is about \$412,000. If we get nobody to work with us, then we give \$412,000 towards transportation proffers. So it doesn't go away if we're not able to do it. And the formula is in section 4.c. of the proffer statement.

Mrs. Vanuch: And then I think you also said in a previous comment something about the retaining wall needing further engineering?

Mr. King: So we don't go and impact the properties, you know, Mr. Henderson's property, the HOA property, extensively. It is a big hill and a lot of... you know, to lay that back, to take up less property, we would put in a retaining wall that would stabilize that slope and then we would, you know, plant grass and replace what vegetation we need to. Yeah, we did, we provided that cost to the County. That's the \$412,000 that Mr. Payne referred to. Yeah.

Mrs. Vanuch: Okay. And then, I have a question on the traffic impact studies. So you guys are offering up some proffers for Eustace which obviously I think is a good thing for the County and for residents. Did you do any studies for Winding Creek and... the intersection of Winding Creek and Courthouse?

Mr. King: We did not. When we were doing this, we were looking to analyze our site and the intersections near our site. VDOT and Stafford County has done that work with the improvements that are about to start in January. Shirley Contracting has been, what I've heard, awarded the contract and it's supposed to start in early 2017, and all the improvements and I believe it includes the new interchange are supposed to be completed by 2020. At that point... that's going to clean up another really bad area because of the offset in the intersections of Ramoth Church and Winding Creek.

Mrs. Vanuch: Yeah, that's terrible.

Mr. King: So they're going to line up those two roads. There's going to be a stoplight. Right. The scoping was done by the County and VDOT and not us.

Mrs. Vanuch: And so that's the reason you didn't study it. It wasn't... because, you know, I think you guys did appropriate studies if you were to have the Fireberry connector. But if you remove the Fireberry connector, now most of that traffic's going to go out to Winding Creek because there's nowhere else really for it to go.

Mr. King: It didn't change. We updated the study here before we resubmitted this plan without the Fireberry connection, and it did not change the Level of Service; it was A and B.

Mr. Payne: The irony in the Fireberry connection is the fact that we were actually just contributing little traffic to cross Fireberry. Most of it was still going to Winding Creek. So the analysis didn't change that much.

Mrs. Vanuch: And so just... I want to just repeat it. So but you didn't do the analysis of Courthouse and Winding Creek because the County had already done an assessment based on the changes that were going to be coming to Winding Creek and Courthouse?

Mr. Payne: Well, I don't know the answer. I don't know if that's accurate; I just know that we go in and they say this is the intersections we want you to study and that's what we study, for the TIA. I mean, that's a basic requirement for the traffic impact analysis.

Mrs. Vanuch: Got it. So, I have an additional question on proffers. If you guys are... in your application package you talk about using some of the school impacts to 2020, you're counting on the road impacts of Courthouse and Winding Creek being completed by 2020 which you just mentioned. You also have mentioned that like neighborhoods that are selling in the high \$400's to mid-\$500's build out really slowly, they sell much slower. So would you be opposed to doing an occupancy permit for 2020 to kind of align with all of the other information that you've provided?

Mr. Payne: Yes.

Mrs. Vanuch: So you guys would be willing to proffer that?

Mr. Payne: Yeah, I mean, the market drives the development. But first of all in the scope... the only thing that we've addressed in regards to build-out is scoping because that's what you're required to do to see if the traffic impacts are based on your estimated full build-out plan. So I think that was five years or so. Is that what we did? I mean, that's pretty much a standard for the size of the development. For schools, we only provided that information; we provided it 5 to 8 years because we were asked what our build-out plan may be. But the market drives it. I don't want to handcuff my folks if the market picks up, especially in the high-end market, and say hey, you can't build a home till 2020. It just wouldn't be, in my opinion, fair or reasonable.

Mrs. Vanuch: Okay.

Mr. Payne: But if you think about the timeline that how these projects get up and running, even if it was approved today you wouldn't have the first OP or OC... occupancy permit, I'm sorry, you know, for 2-plus years, even if I was able to go fast. You've got to get a site plan approval, construction plans, you've got to get your building permits. And remember, we're building in the first phase of this all the infrastructure improvements up front. So we're not waiting till the last days of the development to put these improvements in; they're all happening up front.

# Page 10 of 18

Mrs. Vanuch: And then I think I just have one more question hopefully and then I can turn it off to the others. You guys did mention that in April you met with additional HOA's; I think you might have said you met with Autumn Ridge this April.

Mr. Payne: Mm-hmm, yeah.

Mrs. Vanuch: Did you happen to meet with the Bershire HOA in April to talk about your changes?

Mr. Payne: We didn't send out the invites, I think the County sent... Jeff, remind me. I think the County sent out the invites by the direction of Supervisor Sellers if my memory serves me. I don't think we sent out the invites.

Mrs. Vanuch: For the April meeting?

Mr. Payne: April, right.

Mrs. Vanuch: Okay.

Mr. Payne: Including anybody who spoke at the last public hearing; I think it included... it probably went to the HOA's. I'm not going to speculate but we did not handle those invitations.

Mr. Harvey: My recollection was it was a Town Hall meeting. My department was not involved in the notification for the Town Hall, so I don't know who was notified.

Mrs. Vanuch: Okay.

Mr. Harvey: I know that there was a fair attendance; there was probably 20 or more people there.

Mr. Payne: Right.

Mrs. Vanuch: Do we know if most of those residents were from Autumn Ridge or Berkshire?

Mr. Payne: My bet is Autumn Ridge.

Mrs. Vanuch: Okay. Because I think that's one of my underlying concerns is that we remove the concerns from Autumn Ridge, which is the Fireberry connector, which then creates a whole new set of concerns for the residents in the Bershire neighborhood which they didn't have previously just because of the way the traffic pattern changes. So, I don't know if there's anything you can do to address those concerns.

Mr. King: Let me address that Mrs. Vanuch. We also had a meeting at Porter Library. And that was really a Berkshire meeting that Phil had asked us to do. And there were five people that attended.

Mrs. Vanuch: When did you do that?

Mr. King: That was... five people attended it and one of them was Wendy Maurer, before she was elected.

Mrs. Vanuch: So that was before the Fireberry connector was removed.

# Page 11 of 18

Mr. King: That is correct, that is correct, yeah.

Mrs. Vanuch: Okay. So that's the crux of the issue. Once you remove the Fireberry connector, then the Berkshire people have a different issue. So they were probably okay with that connector, but now they're probably not.

Mr. King: We are meeting with them Tuesday evening. They have their annual HOA meeting and they... Landmarc Realty had reached out to us about... Mr. Payne and I about attending that meeting which we are going to do.

Mrs. Vanuch: Well, I think that's great and I think that might even set us up for if we were to advertise for an additional public hearing for December, you guys have a chance to meet with those residents and hopefully can address their concerns so that I'm not getting hundreds of emails and Wendy's not and we don't have a very contentious Supervisor meeting.

Mr. Payne: I'm surprised that that many folks would be contacting you guys in regards to this project. It's been very public for a very long time, including... again, I'm not trying to throw the President of the HOA under the bus by any means because he's great to work with, but this project's not new to anybody in that area. So, we're happy to meet with them. We're going to meet with them next week. They'll have an opportunity to come to the public hearing with the Board of Supervisors. I think it's, just in my opinion, not equitable to open this back up to another public hearing. It's not my call; if you're able to do it I'll have to come and do my job. I'm asking respectfully, since this project has been out there for quite a while, again we worked very hard to go back to the community to address their concerns, their major concerns that came up in the last run of this if you will, including going to the County Board of Supervisors to get a waiver for the 12-month re-application process. So, that's my request respectfully. Not trying to be disrespectful to you. I understand that your addressing your constituents' questions and concerns. But again, we can do that next week and we can also play a role in the public hearing process thereafter.

Mrs. Vanuch: I'm done.

Mr. Apicella: Other questions?

Mr. Rhodes: Yes, Mr. Chairman.

Mr. Apicella: Mr. Rhodes?

Mr. Rhodes: Mr. Payne, just to confirm, when in the schedule would you be doing the work on the improvement north of the property for the corner there?

Mr. Payne: During the construction of the first phase of the units.

Mr. Rhodes: Could you help me understand?

Mr. Payne: It's in the proffer statement on the bottom of page 3.

Mr. Rhodes: Right. So, once you start constructing the first units, you'll start the work on the corner there?

Mr. Payne: Is that the plan? We've got to do the site work obviously.

Mr. Rhodes: I know. You've got the site work...

Mr. Payne: While we're doing the site work it's going to be cheaper, if you will, you know, more efficient for us to go ahead and do it all at the same time.

Mr. King: We would include that as part of the design construction plan.

Mr. Rhodes: Okay.

Mr. King: Which what we're looking at, if this got approved here by the Planning Commission and the Board in this calendar year, this wouldn't even start construction until 2019.

Mr. Rhodes: Right.

Mr. King: So, it's, you know, it's a couple years out.

Mr. Rhodes: But when you start that site work, it's in that front end... that is part of your site work (inaudible).

Mr. King: It's going to be in that first phase... it'll be in the first phase of it. We know what has to happen. We've looked at it already. It's just a matter of getting the... all the elevations and surveying that all in to make sure it ties off correctly.

Mr. Rhodes: And when you do the turn-in, you've got a tapered turn-in for one of the entrances, right?

Mr. King: Right. Both of them.

Mr. Rhodes: Both of them, okay. And how will those be finished? Will they be curbed?

Mr. King: We will run the curb out around the returns toward Winding Creek. And then there's tapers...

Mr. Rhodes: Right, so in and out and along the taper you'll have curbing.

Mr. King: Yes.

Mr. Rhodes: So there'll actually be a little improvement on there.

Mr. King: Yes.

Mr. Rhodes: And lastly, I didn't think to try and pull it up and it just triggered my mind as we were talking tonight, do you recall what percentage of the traffic was estimated to be towards Fireberry versus (inaudible)?

Mr. King: I want to say it was like 10%.

Mr. Rhodes: Okay, that's what I kind of thought too. So it flowed the other 10% back out that way.

# Page 13 of 18

Mr. King: Yeah, yeah.

Mr. Rhodes: Okay, thank you. Thank you Mr. Chairman.

Mr. Apicella: Other questions? Okay, seeing none; thank you.

Mr. Payne: Thank you Mr. Chairman.

Mr. Apicella: I'll bring it back to the Commission. Mr. Rhodes, Mrs. Vanuch, it's in your districts.

Mrs. Vanuch: So, I just want to reiterate and I'm willing to get some feedback from my fellow Commissioners about the public hearing process. I know I kind of went off on a tangent earlier.

Mr. Apicella: I'm sorry, I never do that.

Mrs. Vanuch: I know... I was going to say I was trying to be like you but I didn't want to hurt your feelings. So, I feel very, very strongly that we give the Berkshire residents the opportunity to come speak. And if nobody shows up, then we know our path forward. And if only one person shows up, at least we know where that neighborhood stands and we've given them the opportunity and we've set up a very successful recommendation to the Board of Supervisors. So, I'm willing to listen to feedback. Anybody?

Mr. Rhodes: I would just, and certainly if that's the will of the fellow Commissioners, you know, I wouldn't stand in the way. I think the beauty of the process that we have, while it's if you're not involved with it, it is a bit surprising as we go along at times, you know, when you learn things and start understanding how it works. But the beauty of the process is really, the Planning Commission process is the feeler. And it's to get the awareness. Part of it is just getting the awareness and the attention of people realizing that something's out there. And sometimes it comes at the public hearing and sometimes it comes following the public hearing as you do in the continuing sessions like we are tonight, and it gets that awareness. But it's that first stage... there is the entire additional public hearing portion, so there's a whole nother opportunity for the voice in the other sessions to occur in the process. So, I'm not sure for the cost involved in the other notifications and delay, that there's a part of me that just doesn't know how much more it adds because there is the other public hearing. I would never want anybody to be lost out on their opportunity, but we do have that there. And there's a part of me that says with the commitment of Mr. and Mrs. Hall, there is not going to be anywhere in Berkshire that's not aware of the public hearing that's happening with the Board of Supervisors, if that were the way it's going to go. There's not going to be a lack of awareness, even if we only did the limits of the ordinance of the public hearing and it only went to the HOA, I have a funny feeling that it wouldn't matter if it only went to the management company. There's still going to be a lot of people who are going to know about it, if that's the route that we go with. So, there's a part of me that's not as concerned there. I will tell you what has motivated the heck out of me and excited the heck out of me on this project, and it's not the project. I started learning about public hearings and stuff because I didn't have a clue how they worked when I got roped into doing this weird thing called the Youth Driver Task Force. And it kind of just came out of the blue and it was after four kids got killed on these roads, and my daughter was getting ready to get her driver's permit, my eldest daughter. And, so there's been nothing that has motivated me more than improving the dangerous curves than limiting the amount of sprawl and trying to do anything we can to keep it from spreading out onto those crazy roads that cannot support any infrastructure, and keep it as close in as possible. Maybe not perfect with the infrastructure, but as close in as possible with the infrastructure that we do have and that will get improved. But it's the things about the road. So, when I saw in the proposal that they were going to attack that corner, which is not going to get touched -- it is not going to get touched for the next

10 years. It's probably not going to be touched for 15 more years. When I saw something that's going to touch that corner, and it may only be 3 accidents on that road but it scares the heck out of me because I drive it almost every day and it's always kind of freaky when you come around the corner and you actually see another car that's over there. So I was so surprised those numbers were down. I thought maybe it was a one-year number. I just wanted to make sure I (inaudible). When I saw that in there, I've got to tell you, I was motivated forward; because there's no other way that's going to get done for a long time. And then we add to that the fact that this is one of the last things, at least the way the state legislature has it for us, to actually have \$1.6 million that's going to go towards the schools, that's going to have other proffers that are coming forward. There's a part of me that's actually attracted to this in many ways. It is a Level of Service A/B, it doesn't change. You know, those are things; we are going to have Courthouse Road that's improved there. So, I have some... I just have a lot of positive leanings. I'll just lay it out there. But a bunch of it is because they finally directed it towards that corner. I like seeing that corner that's improved. So, if others feel they'd like to go back and do another public hearing, I just... knowing that there's another one, that's always important to me and this is what stimulates a lot of times the interest that actually gets all the comments out there. I'd certainly go with how others want to go, but I don't know that that's necessary. And I think moving it forward... and if the Board isn't satisfied -- it's going to come down to the Board's the deciding entity. Are they satisfied with the improvements in the corner and the amount limit or scope of the implications that are on there or not. I think there's not much new that's going to be (inaudible) by having another six weeks in the process. It's going to be the same issues that'll be brought forward. So, those are my points. Thank you, Mr. Chairman, for that long-winded thought.

Mr. Apicella: Are there other comments? I guess I think you've said it well, Mr. Rhodes. And you always hear me raise concerns about setting precedents. I've been here 5-plus years; you've been here a lot longer. I can't remember a time where we re-advertised a public hearing for a reclassification. We may have done it for ordinance changes, but that's because we made a change that necessitated us to have to have another public hearing -- if that even happened; I can't even recall that happening. So, I appreciate that some issues and concerns have been raised by one of the residents. And it's why I ask the question: what's changed between the last time this was in front of us and I think it passed almost unanimously, and the one that's in front of us today and it's only a minor change in the grand scheme of things, which is taking out the Fireberry Road inter-parcel connection which was requested by some of the property owners. So, I would be concerned about, again, setting a precedent and re-advertising for another public hearing without having a real driving force, a very strong reason for doing it. I'm not... I hear what you're saying; I appreciate it. We're always going to have somebody who is going to be opposed to a project. And if that's going to be our... or somebody who didn't know there was a public hearing although it's advertised in the paper, somebody's always not going to be happy that they didn't get the notice that they thought they should have gotten. And so, if we're going to reopen public hearings because of that, then we're going to be doing it quite often. So, again, I respect and appreciate all of the comments that you made. And we're not the last stop here. If we were, I might see it differently. I think Mr. Rhodes is spot on; all we do is make a recommendation. The folks you really need to talk to at the end of the day are the Board of Supervisors and they're going to make the final decision. Everything that you've provided to us you can certainly provide it to them and then some. And, as Mr. Rhodes said, you can certainly, you know, rattle the tree with your neighbors and get them to come to that public hearing as well. So, I'm not quite sure there's a motion.

Mrs. Vanuch: I didn't make a motion because I wanted it to be up for discussion.

Mr. Apicella: So, I just wanted to offer my comments. So I'm going to throw it out there again. Is there a motion on these two matters in front of us?

Mr. Rhodes: I make a motion to recommend forward to the Board of Supervisors recommending approval.

Mr. Apicella: Is there a second?

Mrs. Bailey: Second.

Ms. McClendon: Mr. Chairman, you need to take them up separately; the reclassification first and the CUP second.

Mr. Apicella: Okay.

Mr. Rhodes: I'm sorry, RC16151333, Reclassification, Winding Creek, a motion to recommend it forward.

Mrs. Bailey: I'll second.

Mr. Apicella: Okay, there's been a motion that's been seconded. Any further comment Mr. Rhodes?

Mr. Rhodes: Yeah, not to belabor because I took way too long in my other comments. I appreciate and respect the passion that Mrs. Vanuch showed in responding, and this is in no way against it. I believe absolutely in everything you said. And it is in no way meaning to diminish or slow down the roll. It's just knowing... I now know absolutely the Berkshire community and all those that have comments and want to make those known will be able to bring that. And that is the positive part that works in the Planning Commission. So, I mean that. The long diatribe was not meant in any way to be a negative towards that. I just think all the facts are out there. We know exactly where... I think we know most of the facts that are out there. And that's what the Board is elected to consider. And now we know a fulsome version of the facts from the Berkshire's perspective will definitely come out along with all the others. So I think it'll be good, I think it'll be fulsome. As you said, Mr. Chairman, if this were the public hearing, I'd have a completely different perspective. I'd be much... not that I'm not concerned, but I would much more concerned if there were folks that didn't feel they were getting it. But knowing that there was a full cycle to go, I feel comfortable recommending it forward. I do think... I don't think anything's perfect; I do think the pros outweigh the cons, that's why I would recommend approval. It can always be better and I'm sure the Board will glean out the best parts of it and take it to the right place. Thank you Mr. Chairman.

Mr. Apicella: Thank you Mr. Rhodes; Mrs. Bailey?

Mrs. Bailey: Mr. Chairman, just briefly. I do appreciate the comment and the concerns that Mrs. Vanuch expressed in regards to making sure that we have adequate and appropriate sending out notices to the public. And there are always going to be those that don't receive notices, thought that they received notices, and so forth and so on; I don't know what the cure is to that. But I do believe that Mrs. Vanuch is acting out in trying to just protect the interests of the people within her district and I applaud that. But having said that, I do believe that we're also in abeyance with our due process that we have here, and the applicant has indicated that they will be meeting with the residents of Berkshire. So, I'm sure that within that meeting, when it goes forward towards to the Board of Supervisors, there'll be plenty of time to discuss the issues and concerns and to take a look at those at that particular point in time. This project does bring... for me I'm a little bit on the fence, pro and con, but I think the positives outweigh the negatives. The curves in Winding Creek Road, you know, that's the way that God made it and when the

road was first put in, that's the way that the individual saw fit. That doesn't mean that it's right for public transportation and automobiles and so forth and so on. But that is one part of the road there that I'm glad that the applicant is willing to take on and try to correct. If not, then that road would be there in that condition even longer. So that is really the point out of all of this that persuades me in that direction, as well as the... I think it's a very good strong proffer package from the applicant and I do appreciate that.

## Mr. Apicella: Thank you Mrs. Bailey. Mr. Coen?

Mr. Coen: Yes, and a lot of my comments I'll save for the second vote. But just since we're spending a lot of time on what Mrs. Vanuch said, I sort of agree with her. I hope, and I think I asked Mr. Harvey that in the future, if we have something that has come before us and for whatever reason the Supervisors reject it and then it comes back, that our normal protocol will be to automatically when we send out notices contact people who spoke at the public hearing when it came before us the first time. I think that's the least we could do. And then to the applicant, since they're having to meet with the Berkshire people next Tuesday, that might be a lesson for future reference that when there's something and you've substantively changed development in a plan from last April to now, or two years ago to now, it might be a better move to reach out to all the various neighborhoods because you end up having to do it anyways. So, I'm not... I will include in my second, when we get to the next vote, all the reasons why I was the lone vote against this the last time and I'm still going to be probably one of the minority in this this time.

Mr. Apicella: Other comments? Okay. I just want to add to what's been said primarily with respect to Mrs. Bailey and Mr. Rhodes. I agree with the comments that you all made. I also want to add my thanks and appreciation for strengthening the language about the open space piece, especially in light of the comments that we just got from the Parks Director. Alright, there's a motion on the floor recommending approval of RC16151333; cast your vote. Okay, the motion carries 4 with 2 nays and 1 abstention. (*Mr. Coen and Mrs. Vanuch opposed; Mr. English abstained.*) Okay, is there a motion on the Conditional Use Permit?

Mr. Rhodes: Yes, Mr. Chairman, I make a motion to approve the Conditional Use Permit, 16151334.

Mrs. Bailey: I'll second.

Mr. Apicella: Okay, there's been a motion and it's been seconded. Any further comment Mr. Rhodes?

Mr. Rhodes: I'm going to stop talking.

Mrs. Bailey: No further comment.

Mr. Apicella: Anyone else? Mr. Coen?

Mr. Coen: Okay, this is where I go on. And I respect... I understand...

Mr. Apicella: We're going to take a pause.

Mr. Coen: Yeah, really... for station identification. Several things about this that I didn't agree with when it first came to us and I still don't agree with now. First, I totally understand the concept of infill development. I have supported it in different areas; however, to me there's a world of difference between infill and then humongous fill. You could have done the 20 by-right units as infill. You could have made it 30 or 40 or 50. I think jumping up to 97 is problematic. I understand where individuals say that there's

# Page 17 of 18

not that many accidents, but as Mr. Rhodes pointed out, it is unnerving on that road period. And you're adding, the last census said 2.3 cars per household, so roughly between 200 and 300 cars onto that road. And that is going to be problematic. And yes, I understand that that road's not on our list to be fixed for a while, but I still... to me, logic tells me you're adding 2 to 300 cars on a road. That is still, even if you do that widening, it's still a precarious road. On the issue of the schools, I think the Halls -- do I have their last name right? -- the Halls had very good information on that and I think it really bears mentioning that the state has altered how it calculates capacity for schools. It used to, and the County is just following the state guidelines, but it used to be seat capacity. Now it is they include the entire building. So, they include the auditorium, the library, the gymnasium, even though logic says you're not using all that space. So for a school to be at 98% capacity, when you're figuring in the entirety of an auditorium, that means the school is overcrowded and it just is problematic to sit there and just look at this in a bubble and say, well this is only x number of students when, because we're jumping up to 97, you're adding more to an already overcrowded three schools that are definitely overcrowded. And I don't think anybody said that we are ordering the school system to redistrict, we're just saying the facts on the ground are this is the number of houses, this is the number of students, it's overcrowded; there's nothing going to be built, this is a fact. And that to me is just sort of a real logical argument to say, if we're going to approve jumping from 20 to 97, the proffers should be commensurate. Part of the proffers, if I remember correctly, includes the value of that land which the County doesn't want for that park space. And part of that is certainly the amount of money that's going, and if I remember staff's report from last meeting, the proffer is once again below what we have calculated we need. Granted this may be one of the last ones under the old proffer system and, you know, I've been on this since I've been on the Board, that we continue we say what we need and then we come in lower, and I know I will go out with that. I really have, and it may be my questioning nature, but I looked back at our minutes, I thought back; the entirety of the time we discussed the Fireberry connection, never was it discussed that it's solely because there was 1.2 acres. And logic would have said to me when we were going back and forth and back and forth and whether we're going to have a cul-de-sac or not have a cul-de-sac and can we do this, to me logic would have said, hey, there's 1.2 acres here. If we just took it out of this, we wouldn't have to have a connection with the Fireberry Road so there's not a problem. And so I'm just leery that now that somehow that we now say the 1.2 acres isn't included, that somewhere down the road -- no pun intended -- at a TRC or somebody, you know, Fire, VDOT, somebody's not going to sit there and say we want another connection because that was what we were crabbed at. The reason for Fireberry was there had to be a separate entrance for Fire and Rescue. And when we kept going on, I remember, you know, the whole great discussion of we'll look into a cul-de-sac discussion. And again, it was -- it was a roundabout I think -- the roundabout discussion was because we had to have that connection. And I'm just leery of all of a sudden... I just don't... to me it doesn't connect. No pun intended. But why didn't that just... that would have been a solution when this came to us two years ago. We would just say hey, we'll just pull out the 1.2, we don't need a connection and it would have gone through. So, I just... I'm leery of that. And again, the cumulative impact to this are by making it... by going up from 20 to 97 will have an impact. And I too go on that road and it's leery, and more cars it's just going to be leery. And, you know, I just don't think that the impact with the proffers below what we have said we believe there are and the public safety of the roads, I just don't feel comfortable with it. So that's why I'm going to vote no once again.

Mr. Apicella: Thank you Mr. Coen. Anyone else? Okay, seeing no one else, all those in favor of the motion cast your vote. Okay, the motion carries with 4 yeses, two no's (*Mr. Coen and Mrs. Vanuch*), and one abstention (*Mr. English*). Thank you very much.