



County of Fairfax, Virginia

MEMORANDUM

DATE: July 19, 2022

TO: Board of Supervisors

FROM: Bryan J. Hill
County Executive

SUBJECT: County Flood Mitigation Levels of Service

Purpose Statement

County staff are seeking Board input on a flood risk reduction level of service at the July 26, 2022, Board of Supervisors Environmental Committee (BOSEC) meeting, and this memorandum provides related background information. Upon Board direction at the July 26, 2022, BOSEC meeting, staff will collect data on cost and methods to report back to the Board. County staff require establishing a clear level of service in order to provide cost and method information about flood risk reduction.

Background

Flooding is a threat to life, health, safety, and welfare. To comprehensively address flooding concerns, build resiliency into the stormwater network, and further the One Fairfax policy, the County would benefit by formalizing its flood mitigation levels of service. The defined levels of service would serve as the framework for the development of a countywide Flood Risk Reduction Plan (Plan). The Plan will include recommendations for projects constructed by the County, updated regulations for development and redevelopment, and programmatic solutions (e.g., community outreach) that will lead to a safer community and minimize property damage. This memorandum presents the recommended flood mitigation levels of service for the Board's consideration at the July 26, 2022, Environmental Committee meeting.

Proposed Flood Mitigation Levels of Service

County staff developed the following proposed flood mitigation levels of service for existing structures and future development:

- The County will implement measures that will help to mitigate the risk of damage to existing structures from flooding during a 100-year storm¹ event (see below).
- Secondary to structural flooding², the County will implement projects on a priority basis to safely convey yard or road flooding to minimize risk to life and damage to property.
- Currently, new developments are required to provide adequate drainage and safely convey the 100-year storm to prevent increasing flood risk to downstream structures and safely convey yard or road flooding to minimize risk to life and damage to property. The County would strengthen data availability and analysis for rigorous application of the requirement for safe conveyance of the 100-year storm.
- The County would provide state-of-the industry data so that computations of design flows and flood levels for the 100-year storm will account for future changes to rainfall amounts and sea level rise due to climate change consistent with the [Resilient Fairfax Climate Adaptation and Resilience Plan](#).

The proposed levels of service build on the County’s existing flood mitigation program. The service levels build on the 1997 Board Policy to prioritize prevention of structural flooding over yard flooding (see Attachment A), which the County would update. If adopted, the proposed service levels would revise the County prioritization process for infrastructure projects that reduce the risk of structural flooding. Currently, the Department of Public Works and Environmental Services (DPWES) focuses projects in areas where structures have been damaged after flood waters have overwhelmed County infrastructure or exceeded the boundaries of a County storm drainage easement. The proposed service level for existing structures would apply a proactive risk-based approach to County flood mitigation projects by factoring the frequency, degree of flooding, and equity considerations into project selection and prioritization, regardless of proximity to existing infrastructure.

Proposed Next Steps

1. To meet the proposed level of service for existing structures, DPWES will use the following process:
 - **Existing structural flooding prioritization:** Currently, there are about 600 reported structural floodings. DPWES will evaluate these floodings against the level of service criteria to prioritize the projects as a part of the County’s overall flood risk reduction program. Flood mitigation projects may include a combination

¹ The 100-year storm event has a one percent chance of being equaled or exceeded in a given year. The 100-year storm event is nationally accepted as the “fair balance between protecting the public and overly stringent regulation” ([Floods | U.S. Geological Survey \(usgs.gov\)](#)).

² Structural flooding includes damage by flood waters to a structure as defined in [Zoning Ordinance Section 9104 Floodplain Definitions](#).

of the following: improvements to the overland relief path or stormwater conveyance system; new or enhanced stormwater management facilities; flood proofing³ measures; or voluntary property acquisition. It should be noted that some structural floodings do not have any practical engineering solution.

- **Existing yard flooding prioritization:** There are thousands of reported yard and road floodings, but only a limited number of these pose a danger to life and safety. Under this proposed level of service, County staff would use national/state risk evaluation standards to identify and prioritize projects that mitigate risks to life and safety. Additional assessment would be required to determine how many of the reported yard and road floodings are high risk. Some of these nonstructural requests are also addressed as part of the structural flood mitigation projects.
 - **Identify properties at future risk of flooding:** Staff recognizes that residents do not always report flooding. To apply these proposed levels of service equitably, staff plans to develop a flood-prone properties and neighborhoods map to identify areas in the County that appear to be at a higher risk of flooding. After identifying flood-prone neighborhoods, staff will engage with the community to better understand their stormwater management issues and solutions. DPWES is currently creating a pilot community engagement framework for this purpose. This proactive approach will help identify preventative measures the County could take to ideally address drainage issues before they might cause structural floodings.
2. Similar to the approach to meet the proposed level of service for existing flood risk, Land Development Services (LDS) will take the following steps to analyze opportunities to enhance current regulations and design criteria to sustainably address flood risk associated with new and redevelopment construction:
- **Develop a list of potential policy, regulatory, and design criteria enhancements:** Today, new development and redevelopment projects must comply with a range of regulatory requirements. Some of these regulations like the Uniform Statewide Building Code (USBC), the National Flood Insurance Program (NFIP), and the county's Floodplain Regulations focus on life, safety, and property protection of the individual homes and commercial buildings permitted for construction. Other codes like the County's Stormwater Management Ordinance and Erosion and Sedimentation Control Ordinance seek to limit downstream impacts of the same construction. The County's Zoning Ordinance, Public Facilities Manual, and Comprehensive Plan bridge both individual protections and downstream impacts. Staff will work with internal and external subject matter experts to develop a list of potential regulatory enhancements to analyze for efficacy and cost-benefit. Such enhancements could include: expanding the analysis of downstream impacts and protection; increased onsite detention of

³ See flood proofing definition in Section 9104 of the [Zoning Ordinance](#)

stormwater runoff; and a more extensive review and designation of flood paths to safely convey floodwaters. All enhancements will incorporate the increased flood risk associated with climate change.

- **Develop a Proof of Concept measured against the proposed level of service:** Through engagement of an outside consultant with expertise in stormwater management, staff will closely examine each of these possible regulatory enhancements to consider efficacy of each and their respective costs and benefits. Staff will return to the Board with their findings.
3. Managing flood risk is a shared responsibility among the County, developers, and residents. The County will support resident participation in flood risk reduction through the following efforts:
- **Education and Outreach:** During significant storm events like hurricanes and even intense thunderstorms like the July 8, 2019, event, some risk of flooding always remains, especially from storms exceeding the 100-year event. The County will provide community education and outreach on flood risk and insurance and explore programs that incentivize flood risk reduction by private property owners who want to pursue flood mitigation measures and/or seek protection above the 100-year storm event.

Conclusion

The proposed flood mitigation levels of service meet multiple County priorities. The proposed risk-based approach operationalizes the One Fairfax policy by intentionally considering equity in decision making, expending County resources objectively and fairly. The levels of service provide the framework for the Flood Risk Reduction Plan, a strategy identified in both the draft [Resilient Fairfax Climate Adaptation and Resilience Plan](#) and the [Safety and Security](#), and [Effective and Efficient Government](#) focus areas of the County Strategic Plan. With over \$108M spent or anticipated to be spent on completed and active projects that will reduce flood risk to more than 400 properties, the County has a strong history of flood mitigation (see Attachments B and C for additional information). Coupled with the extensive work the County is already doing to reduce flood risk, the staff recommended flood mitigation levels of service will help develop a comprehensive countywide flood risk reduction plan to assist residents living in flood-prone communities and set the County up for a safe and more resilient future.

Attachments:

- A. 1997 Board Policy Regarding Criteria and Procedures for Establishing Stormwater Control Project Priorities for Funding Consideration
- B. List of Completed Flood Mitigation Projects

C. May 2022 Memo to the Board on the County Flood Mitigation Update

cc: Rachel Flynn, Deputy County Executive
Kambiz Agazi, Director, Office of Environmental and Energy Coordination
William Hicks, Director, Land Development Services
Tracy Strunk, Acting Director, Planning and Development
Christopher Herrington, Director, Department of Public Works and Environmental Services (DPWES)
Eleanor Ku Coddling, Deputy Director, DPWES, Stormwater and Wastewater Divisions
Chad Crawford, Director, DPWES, Maintenance and Stormwater Planning Division
Craig A. Carinci, Director, DPWES, Stormwater Planning Division

FAIRFAX COUNTY, VIRGINIA

**Board of Supervisors Policy for Establishing Stormwater Control
Project Priorities for Funding Considerations**

Adopted by the Board of Supervisors on April 28, 1997

The intent of this policy is to establish a system to define and prioritize stormwater control projects by separating them into specific categories based on their objective. This prioritization will be used in the selection of projects that are recommended to the Board of Supervisors for funding consideration. In order for a project to be considered as a fundable project, it must be included in at least one of the categories listed in priority order as follows:

- Category 1 — Projects that are mandated by state or federal regulations for immediate implementation and projects that address critical/emergency dam safety issues.
- Category 2 — Projects that alleviate structures from damage by flood water or by being undermined by severe stream erosion.
- Category 3 — Projects that achieve stormwater quality improvement in specific conformance with the County's obligations under Chesapeake Bay initiatives and/or the County's requirements under the Virginia Pollutant Discharge Elimination System Permit for storm sewer system discharges.
- Category 4 — Projects that alleviate severe streambank and channel erosion.
- Category 5 — Projects that alleviate moderate and minor streambank and channel erosion.
- Category 6 — Projects that alleviate yard flooding
- Category 7 — Projects that alleviate road flooding

Category 1 projects primarily include remedial repairs to County-owned dams to ensure the stability and integrity of the County dams in conformance with the Virginia Dam Safety regulations. Category 2 projects are intended to protect structures from damage by both flood waters and undermining of foundations by severe streambank erosion.

Wet basement conditions caused by groundwater are not included in this policy. Groundwater projects are addressed in the County Policy on Groundwater adopted by the Board of Supervisors on December 15, 1986 (copy attached for information).

Category 3 includes the implementation of regional stormwater management ponds needed to remove pollutants from stormwater and thereby meet the requirements of the County's Virginia Pollutant Discharge Elimination System Permit. Category 3 will also include nonpoint source water quality improvement projects that may be required as part of the County's obligation under the Chesapeake Bay initiatives. The remaining categories 4, 5, 6, and 7, are self explanatory.

Within each category, specific priority numbers will not be assigned to each individual project because the list of identified stormwater drainage improvements projects is very dynamic. New projects are added to the list as a result of drainage investigation performed on behalf of citizens and/or Board Members. Projects are removed from the list following corrective action(s) by various agencies including the County, Virginia Department of Transportation (VDOT), developers, homeowners associations, and private individuals. In addition, the severity of each stormwater deficiency is often altered over time due to changes in surrounding land use and stream dynamics.

The selection of projects for funding consideration within each category will be made based on the severity of the problem, number of structures affected, frequency of damage being incurred, and other factors that may be relevant at the time of the selection. In addition, the length of time since a project was first identified will be a consideration factor to differentiate between projects within a category where all other factors appear equal.

The selection of projects to be recommended to the Board of Supervisors for funding will also consider public/private cost sharing opportunities for the County to save substantial funds for implementation. These situations arise when developers proffer to contribute to the drainage program by providing funding, land rights, design, and/or construction for specific projects. Other opportunities arise for the County to save substantial funding by participating in cost sharing with VDOT, developers, and other agencies for the joint implementation of drainage projects. The ability to participate with the public/private sector at the appropriate opportunity will reduce overall project costs for the County. In limited situations, staff will select projects for County funding consideration based on opportunities to participate with others who volunteer to

contribute or participate in the implementation of a particular project. Any priority adjustments will be contingent upon the County saving a substantial amount of funds in achieving the implement of a project. Priority adjustments to be recommended to the Board for approval will be considered by staff on a case-by-case basis. Any potential legal liability issues relating to stormwater control projects or easements will be considered in prioritizing projects and will be brought to the attention of the Board. The nature and extent of such potential liability will be evaluated in the prioritization process.

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FAIRFAX COUNTY, VIRGINIA

Board of Supervisors Policy for Groundwater

Adopted by the Board of Supervisors on December 15, 1986 (includes administrative updates based on County reorganizations through 1998)

INTENT

To minimize groundwater conditions which may impact the health, safety, and general welfare of the citizens of Fairfax County by:

- Emphasizing the detection of groundwater problem areas during the rezoning and special exception application plans, the plan review and approval phase, and the construction phase of all future residential development within Fairfax County and reinforcing applicable building codes, regulations, and restrictions to minimize the occurrence of groundwater problems;
- Resolving groundwater problems, on a cost-effective basis, associated with public facilities maintained by the Fairfax County Department of Public Works and Environmental Services;
- Assisting residential property owners in the correction of their existing groundwater problems by providing guidance, and when necessary and economically feasible, making available a public outfall into which private groundwater control improvements can be discharged.

OBJECTIVES

- To minimize the occurrence of future groundwater problems in proposed and future residential development within the County. Specifically, the prevention of:
 1. Damage to public facilities
 2. Structural damage to residential dwellings
 3. Wet basement conditions
 4. Unmanageable wet yard conditions
 5. Damage to private home appurtenances
- To resolve problems created by groundwater which result in damage to public facilities which are maintained by the Fairfax County Department of Public Works and Environmental Services, subject to the severity of the problem, the availability of funds, and other engineering considerations.

- To provide guidance to property owners of residential dwellings desiring to install foundation drains, sump pumps, interceptor trenches, or other groundwater control improvements for the purpose of alleviating:
 1. Structural damage to dwellings
 2. Wet basement conditions
 3. Unmanageable wet yard conditions
 4. Damage to private home appurtenances
 5. Or other groundwater related problems

Depending on the severity of the problem and subject to availability of funds, to provide a public outfall for property owners of residential dwellings who install foundation drains, sump pumps, interceptor trenches, or other groundwater control improvements to alleviate:

1. Structural damage to dwellings
2. Wet basement conditions
3. Unmanageable wet yard conditions
4. Damage to private home appurtenances

GENERAL POLICY

I. Proposed and Future Development

The following procedures shall be utilized to minimize occurrence of groundwater problems in proposed and future residential developments within the County. These procedures shall be applied during the rezoning and special exception application phase, the plan review and approval phase, and the construction phase of the development process.

A. Rezoning and Special Exception Application Phase

1. The applicant will be requested to locate and identify wet soils areas on property subject to review by the Department of Planning and Zoning (DPZ) for rezoning and special exception applications related to residential development. It will be suggested that this information be based on Fairfax County soils maps together with other site specific information which may be required of the applicant and will be confirmed during staff analysis of the application by DPZ staff through review of available soils maps and descriptions or other relevant sources.
2. The staff report will note wet soils areas and recommend that wet soils areas either be set aside as open space or that homes built in such soils have engineered drainage. In proposed developments where severely wet soils areas will be within proposed construction limits, the staff report will state that a geotechnical study may be required by the Director of the Office of Site Development Services (OSDS) during the plan review and approval phase. The DPZ will attempt to gain

a commitment from the applicant at the time of rezoning or special exception application review to address problems associated with wet soils.

B. Plan Review and Approval Phase

1. All plans and preliminary Subdivision Plats for residential development submitted to OSDS for review and approval will contain a soils map identifying each soil type within the area proposed for development and any existing or potential groundwater problems.
2. OSDS staff will review and evaluate the soils information in coordination with available soils maps and descriptions or other sources.
3. OSDS will require submission of a geotechnical report prepared by a qualified professional engineer in soils where adverse groundwater conditions exist or are probable.
4. The geotechnical report will include recommended remedial measures to minimize future groundwater problems in accordance with this policy and County standards.
5. OSDS staff will evaluate the geotechnical report according to the general requirements and procedures outlined in the Public Facilities Manual and this policy.
6. OSDS will require inclusion of recommended remedial measures in the construction plans.

C. Construction Phase

1. OSDS will inspect construction of new developments to compel adherence to the approved plan.
2. All construction within wet soils areas will be performed under the inspection of a geotechnical engineer as specified in the Public Facilities Manual.
3. Where groundwater conditions are encountered during construction that were not included on the approved construction plans, and that could result in structure damage, wet basement conditions, or damage to public facilities, OSDS will require implementation of remedial measures by the developer in accordance with this policy and County codes.
4. The developer will implement remedial measures where groundwater conditions

are encountered during construction that were not included on the approved construction plans, and which may result in wet yard conditions or damage to private home appurtenances.

II. Existing Development

The correction of groundwater problems in existing residential developments may entail remedial action by either the property owner or the property owner with assistance from Fairfax County. The following criteria and procedures will be utilized by County staff to address groundwater problems in existing residential developments.

A. Jurisdiction

1. Groundwater conditions resulting in structural damage to dwellings, wet basement conditions, unmanageable wet yard conditions, damage to private home appurtenances, or other groundwater-related problems are solely the responsibility of the property owner. The County may, however, take certain voluntary action to the extent provided for in Section 11B, Items 2, 3, 4, 5, 6, and 7 on pages 4 and 5 of this policy.
2. It is understood that Fairfax County will not install improvements on private property for correction of groundwater problems other than, in certain specified situations, providing a public outfall into which private groundwater control devices can be discharged.

B. Procedures

1. Upon receipt of a residential property owner complaint of groundwater conditions, the DPW&ES staff may perform a field investigation, and where necessary will coordinate with other applicable agencies.
2. DPW&ES staff may provide the property owner with guidance by making available pertinent information and advising the property owner as to how to secure private professional services to address the groundwater problem.
3. When the property owner has substantially demonstrated the intent to proceed with the private groundwater improvements by obtaining consulting services when necessary for design of the private improvements, submitting plans to OSDS for approval and obtaining a OSDS permit, Fairfax County will evaluate whether it is appropriate to extend or provide a public drainage system into which groundwater collected in the private improvements may be discharged.
4. Prior to the County deciding if extension of a public outfall to serve a private

system is warranted, location and capacity of existing storm drainage systems, funding, and other pertinent factors will be evaluated by County staff.

5. Public outfall systems, when warranted, approved, and funded as a project, will be extended the minimum distance necessary, based on topographic, hydraulic, and other engineering considerations, to provide a discharge point for the private improvements installed by the property owner.
6. If an approved fundable project is of an emergency nature and is small in magnitude, funding may be made available from Fund 308, Project A00002, Emergency Watershed Improvements. If the approved fundable project is greater than the Project A00002 funding limitations, or if funds are not available from the current fund balance in Project A00002, the approved fundable project may be placed in the storm drainage program and will be included in the next annual budget cycle by the Department of Public Works and Environmental Services.
7. Available funds may be allocated to approved projects according to the severity of the groundwater conditions for which the private owner is installing improvements. Generally, approved public outfall extension projects should be funded according to the following priority:
 1. Safety considerations
 2. Structural considerations
 3. Other considerations

DEFINITION OF TERMS:

The following definitions for the purpose of this policy include problems caused directly by groundwater. It is not intended that problems such as soil slippage or expansive clays where groundwater may be a contributing factor be governed by this policy.

Groundwater

The presence of subsurface water occurring in soil or rock strata within a zone of saturation below the ground level.

Public Facilities

For the purpose of this policy, public facilities are defined with respect to future development and existing development and correspond to parts I and II of General Policy, respectively.

Future: Those utilities and structures to be maintained by Fairfax County, the Virginia

Department of Transportation, the Fairfax County Water Authority or other public agency.

Existing: Those utilities and structures maintained by the Fairfax County Department of Public Works and Environmental Services.

Structure Damage: Damage to a dwelling that is a result of groundwater. Damage may be exhibited as slab uplift and cracking, foundation wall cracking, inward deflection of walls, or other evidence of such magnitude that a threat to the structural integrity of the dwelling is indicated. This condition shall generally be considered a structural problem. This term shall not be applied to structure damage caused by poor soil characteristics where groundwater is not a major contributing factor.

Wet Basement: Standing water in the basement of a dwelling that is a result of groundwater conditions in poorly drained soils. The wetness may be due to forced flow through cracks in the wall, the floor wall interface, or other areas, causing undesirable living conditions. This condition will generally be considered a non-structural problem. This condition shall not include seasonal dampness or other damp conditions that can be resolved with normal homeowner maintenance such as down spouts, gutter maintenance, maintenance of positive grade away from structures, and use of dehumidifiers.

Unmanageable Wet Yard: Standing water or marshy areas in normally maintained or improved areas that cover in excess of 10% of a residential yard (exclusive of flood plain and forested areas) that is a result of high groundwater tables or springs. This condition shall generally be considered a non-structural problem. The term shall not include periodic wet conditions normal to winter or spring months in Fairfax County.

Damage to Private Home Appurtenances: Cracked, displaced, broken, or otherwise damaged private walks, driveways, patios or other home appurtenances that are a result of the presence of groundwater. This groundwater related damage occurs through processes such as frost heave or erosion. This condition shall generally be considered a non-structural problem. This term shall not include deterioration due to age, usage, weathering, settlement, or wear that is normal to the general area of Fairfax County.

Completed Flood Mitigation Projects
2009-2021

Attachment B

#	Project Name	Year Completed	# of Properties Mitigated	Cost
1	Aldebaran Dr	FY2011	1	\$ 81,000
2	Allan Ave	FY2008	2	\$ 14,000
5	Ampstead Ct	FY2009	1	\$ 34,000
6	Huntington Levee	FY2019	241	\$ 37,000,000
122	Atwood Rd	FY2009	1	\$ 50,000
123	Bell Ln	FY2009	1	\$ 11,000
124	Blanche Dr	FY2008/FY2013	1	\$ 109,000
125	Bouffant Blvd	FY2011	1	\$ 94,000
126	Brookview Dr	FY2012	3	\$ 197,000
129	Buffie Ct	FY2011	1	\$ 75,000
130	Cabin John Rd	FY2009	1	\$ 77,000
131	Cabots Point Ln	FY2014	1	\$ 27,000
132	Camp Alger Ave	FY2013	1	\$ 4,000
133	Columbia Pike	FY2011	1	\$ 55,000
134	Corland Ct	FY2008	1	\$ 97,000
135	Curtice Farm Dr	FY2013	1	\$ 2,000
136	Dearborn Dr Voluntary Acquisitions	FY2012	2	\$ 1,647,000
138	Duncan Dr	FY2009	1	\$ 52,000
139	Durand Dr	FY2012	1	\$ 7,000
140	Everleigh Way	FY2009	1	\$ 6,000
147	Falstaff Rd	FY2008	2	\$ 118,000
245	Four Chimney Dr	2019	1	
246	Fox Hill St	FY2013	1	\$ 9,000
247	Garretson St	FY2009	1	\$ 3,000
248	Gavelwood Ct	FY2009	3	\$ 9,000
251	Gordons Rd	FY2009	1	\$ 25,000
252	Graham Rd	FY2010	1	\$ 138,000
253	Great Passage Blvd	FY2014	2	\$ 227,000
255	Hayfield Road Pipe Conveyance and Flood Mitigation Projects	FY2012/FY2013/FY2019	7+	\$ 9,724,000
257	Hidden Valley Rd	FY2013	2	\$ 25,000
266	Indian Run Pkwy	FY2014	2	\$ 15,000
268	Inglish Mill Dr	FY2012	1	\$ 217,000
269	Karver Ln	FY2014	1	\$ 8,000
270	Kaywood Pl	FY2020	1	\$ 397,000
271	Kendale Rd	FY2009	1	\$ 97,000
272	Kilbourne Dr	FY2008	2	\$ 100,000
274	Kilmarnock Dr	FY2008/FY2013	2	\$ 109,000
276	Lake Meadow	FY2012	1	\$ 7,000
277	Laughlin Ave	FY2009/2013	2	\$ 24,000
279	Lauren Dr	FY2012	1	\$ 8,000
280	Leewood Dr	FY2008	1	\$ 103,000
282	Lorton Rd	FY2014	1	\$ 212,000
286	McFarland Dr	2009	2	\$ 4,000
288	Moline Pl	FY2009	4	\$ 9,000
292	Newington Commons Rd	FY2009	1	\$ 8,000
293	Oak Chase Cir	FY2012	1	\$ 5,000

Completed Flood Mitigation Projects
2009-2021

#	Project Name	Year Completed	# of Properties Mitigated	Cost
294	Overly Dr	FY2013	5	\$ 611,000
299	Post Rd	FY2011	1	\$ 97,000
300	Prince William Dr	FY2011	1	\$ 95,000
302	Shari Dr	FY2011	1	\$ 58,000
303	Sleepy Hollow Rd	FY2008	1	\$ 54,000
304	Stoneleigh Ct	FY2008	2	\$ 177,000
306	Summer Breeze Ln	FY2013	1	\$ 6,000
307	Summertown Way	FY2011	1	\$ 106,000
308	Sumner Rd	FY2012	2	\$ 104,000
310	Tapestry Dr	FY2009	1	\$ 16,000
311	Thornwood Dr	FY2009	1	\$ 121,000
312	Ticonderoga Ct	FY2012	2	\$ 62,000
314	Tod St	FY2012	1	\$ 14,000
315	Tenholm Dr	FY2012	1	\$ 4,000
316	Valley Ln	FY2009	1	\$ 100,000
317	Valon Ct	FY2008	2	\$ 362,000
319	Venice St	FY2011	1	\$ 76,000
320	Venture Dr	FY2013	1	\$ 10,000
336	Westhills Ln	FY2009	1	\$ 2,000
337	Westwood Hills Dr	FY2012	2	\$ 47,000
339	Wickford Dr	FY2013	1	\$ 407,000
340	Wilma Ln	FY2008	1	\$ 12,000
342	Woodacre Dr Voluntary Acquisition	FY2009		\$ 1,024,000
343	Woodhurst Blvd	FY2012	1	\$ 7,000
344	Woodland Rd	FY2009	1	\$ 20,000
345	Wye Oak Commons Cir	FY2009	1	\$ 11,000
347	Chesterbrook Vale Ct	2021	1	\$ 74,000
348	Cavalier Corridor	2019	1	
349	Eldorado St	2020	1	
350	Tractor Ln	2019	1	\$ 16,000
351	Chesapeake Dr	2020	1	
352	Ox Hill Rd	2022	1	\$ 49,000
353	South Park Cir	2022	1	
354	Argonne Dr	2022	1	\$ 16,000
355	Pepperidge Ln	2021	1	
356	Stockade Dr	2021	1	
TOTAL			349	\$ 54,843,000



County of Fairfax, Virginia

MEMORANDUM

DATE: May 10, 2022

TO: Board of Supervisors

FROM: Bryan J. Hill
County Executive *[Signature]*

SUBJECT: County Flood Mitigation Update

On July 8, 2019, a thunderstorm dropped up to 5.3 inches of rain in one hour over some parts of the Fairfax County (County) (up to a 1,000-year storm event), causing a reported 149 house floodings and \$14.8M in damages. As highlighted in the Resilient Fairfax Climate Projections Report, over the coming century flooding will become more frequent with climate change. In anticipation of the release of the draft Climate Adaptation and Resilience Plan, the Department of Public Works and Environmental Services (DPWES) provides the following update on the department's flood mitigation activities and ongoing interdepartmental efforts to develop a comprehensive countywide flood risk reduction plan.

Following the July 2019 storm event, DPWES presented flood response options to the County's Board of Supervisors (Board) Environmental Committee to address flooding and improve stormwater management across the County. DPWES has moved forward with many of the recommendations highlighted in the presentation, including:

- Completing 17 flood mitigation projects on individual residential properties. It should be noted that some structural floodings do not have any feasible solution beyond voluntary acquisition of the property or solutions are not supported by the homeowner and do not move forward.
- With DPWES support, the Board revised a 1996 policy to allow Stormwater Tax funds to be used for stormwater improvements within the Virginia Department of Transportation right-of-way to address flood safety hazards and reduce structural flooding. (See Attachment A)
- Managing 39 active flood mitigation projects with a total estimated cost of \$53M that range in size from flood risk reduction measures on individual lots to neighborhood-scale stormwater improvements.

- Modeling and mapping approximately 813 stream miles with County-regulated floodplains of 70 acres or more and consolidating multiple flood hazard data sources into one comprehensive map for regulatory use.
- Working with the Federal Emergency Management Agency (FEMA) to implement and provide outreach on the updated Flood Insurance Rate Maps (FIRMs) which reflect flood risk based on the latest FEMA data. FEMA anticipates the new FIRMs will be effective in 2023.
- Coordinating with the United States Army Corps of Engineers (USACE) on the Coastal Storm Risk Study Tentatively Selected Plan for the proposed levee and floodwall improvements in Belle Haven. (See Attachment B)
- Responding to ongoing flooding service requests and operating and maintaining existing flood control facilities, such as the Huntington levee and Belle View pump station and tide gate.
- Exploring a flood mitigation partial tax exemption. Staff ultimately determined that a tax abatement program would not be economical to the property owner or county. (See Attachment C)

Additionally, DPWES supports other County departments' flood mitigation related efforts, including:

- Assisting Land Development Services (LDS) in the development of the Localized Flooding Mitigation Policy for Infill Lot Development, as shared with the Land Use Policy Committee in May 2021.
- Supporting the creation and enhancement of Geographic Information System-based tools to help identify flood prone properties during the LDS plan review process.
- Providing input on the Office of Environmental and Energy Coordination's (OEEC's) Resilient Fairfax initiative.
- Working with the Department of Planning and Development (DPD) to encourage stormwater management practices above the regulatory requirements on properties going through the zoning application and development review process that are located upstream of known drainage issues.

In January 2022, DPWES initiated an interdepartmental work group composed of DPWES, LDS, DPD, OEEC, and Northern Virginia Soil and Water Conservation District staff to develop recommended flood mitigation policy options for the County. Later this year, DPWES will present to the Environmental Committee on recommended options to reduce flooding risk for areas already developed and for incoming development.

The interdepartmental work group anticipates recommending updates to policies, development regulations, and programs that may include changes to the DPWES flood mitigation project selection and prioritization process, revisions to the Stormwater Management Ordinance and Zoning Ordinance, and new programs to incentivize flood risk reduction by private property owners consistent with the County's One Fairfax equity policy. Coupled with the extensive work the County is already doing to reduce flood risk, the staff recommendations will help develop a comprehensive countywide flood risk reduction plan to assist residents living in flood-prone communities and set the county of up for a safer, more resilient future.

Attachments:

- A. Board Action Item entitled *Proposed Revision to the Board Policy on the Use of Stormwater Funds for Stormwater System Improvements in the Right-of-Way*, dated March 9, 2021
- B. Letter of Support from the Board to USACE, dated March 29, 2022
- C. Memorandum from DPWES to the Board on Flood Mitigation Partial Tax Exemption, dated June 15, 2020

cc: Rachel Flynn, Deputy County Executive
Kambiz Agazi, Director, Office of Environmental and Energy Coordination
William Hicks, Director, Land Development Services
Barbara A. Byron, Director, Planning and Development
Christopher Herrington, Director, Department of Public Works and Environmental Services (DPWES)
Eleanor Ku Coddling, Deputy Director, DPWES, Stormwater and Wastewater Divisions
Chad Crawford, Director, DPWES, Maintenance and Stormwater Planning Division
Craig A. Carinci, Director, DPWES, Stormwater Planning Division

Board Agenda Item
March 9, 2021

ACTION –

Proposed Revision to the Board Policy on the Use of Stormwater Funds for Stormwater System Improvements in the Right-of-Way

ISSUE:

As a result of Board policy, the County cannot use Stormwater Service District Tax (Stormwater Tax) funds to improve existing stormwater infrastructure within the Virginia Department of Transportation (VDOT) right-of-way that do not serve to protect streams or improve water quality. Inadequate stormwater infrastructure, like undersized culverts, can cause localized flooding. Revision of this Board policy would provide an additional tool to allow the County and VDOT to improve collaboration on stormwater system improvements, address flood safety hazards, and reduce structural flooding in the County.

RECOMMENDATION:

It is recommended that the Board of Supervisors revise the 2006 policy that restricts the use of stormwater funds for road projects, allowing Stormwater Tax funds to be used for stormwater improvements within the VDOT right-of-way to address flood safety hazards and reduce structural flooding. The recommended revised policy is as follows:

Stormwater funds may be used to implement stormwater improvements in the right-of-way where the primary objective is to mitigate property or road flooding, and:

- 1) No Stormwater funds will be used for pedestrian, street lighting, or vehicular improvements except to replace existing facilities that are either damaged by or removed to implement a flood mitigation project; and
- 2) No Stormwater funds will be used to address maintenance needs or fund other roadway or transportation improvements.

Potential right-of-way projects will be evaluated by staff based on safety, severity and frequency of the flooding problem, length of time since a flooding concern was first identified, cost-sharing or matching opportunities with VDOT or Fairfax County Department of Transportation, alignment with other proposed County infrastructure projects, equity, and community support. If the revision is approved, it is also recommended that proposed projects in the VDOT right-of-way be presented to the Board as an information item, as part of the annual stormwater capital improvement program process, or, if the Board requires, as an action item for individual project approval.

Board Agenda Item
March 9, 2021

TIMING:

Board action is requested on March 9, 2021.

BACKGROUND:

The January 23, 2006, Board Summary for the Adoption of the Popes Head Creek Watershed Management Plan stated that "road projects not related to the protection of stream beds or banks or water quality will not be funded out of the stormwater and watershed budget" (Attachment 1). This statement was also included in subsequent watershed management plans adopted by the Board. As a result, the County has not used Stormwater Tax funds to improve existing VDOT stormwater drainage infrastructure that do not serve to protect stream or improve water quality.

Inadequate stormwater infrastructure, like undersized culverts, can cause localized flooding when water backs up on the upstream side. The collected water may overflow across the street, producing road or structural flooding and downstream erosion. Flooding at undersized culverts can also damage public and private property and infrastructure. Revising the Board policy to allow stormwater funds to be used for stormwater system improvements within the VDOT right-of-way would provide another tool to better allow the County and VDOT to collaboratively address public safety and community flooding. Due to the existing Board policy, County staff has not expended resources to develop conceptual plans or cost estimates of potential projects in the right-of-way.

FISCAL IMPACT:

There will be no fiscal impact to the General Fund, but there may be more projects eligible for the Stormwater Service District Tax funds.

ENCLOSED DOCUMENTS:

Attachment 1 – January 23, 2006, Adoption of the Popes Head Creek Watershed Management Plan Board Summary

STAFF:

Randolph W. Bartlett, Director, Department of Public Works and Environmental Services (DPWES)

Craig Carinci, Director, Stormwater Planning Division, DPWES

Chad Crawford, Director, Maintenance and Stormwater Management Division, DPWES

ASSIGNED COUNSEL:

Marc E. Gori, Assistant County Attorney, Office of the County Attorney

17. A-4 - ADOPTION OF THE POPES HEAD CREEK WATERSHED MANAGEMENT PLAN (BRADDOCK AND SPRINGFIELD DISTRICTS)
(12:21 p.m.)

Supervisor Gross moved adoption of the Popes Head Creek Watershed Management Plan. Supervisor Bulova seconded the motion.

Chairman Connolly noted that he, along with Supervisor McConnell met with staff to resolve questions regarding the cost structure of the management plan. As a follow up to the meeting, Chairman Connolly issued a written statement that includes the following:

- The Board's reaffirming of its long history of environmental vigilance, endorsed by its adoption of the Environmental Agenda, which calls for the need to complete the watershed management planning process. The information in these plans is vital to establishing a baseline inventory of potential project and policy needs Countywide.
- These plans represent a menu of options and concepts that require an additional level of fiscal scrutiny. This "cost-scrubbing" exercise for each potential project is essential.

Chairman Connolly relinquished the Chair to Vice-Chairman Bulova and asked to amend the motion to direct staff to recognize the following:

- Projects, programs, and policy items in this plan will first undergo appropriate review by County staff and the Board prior to implementation. Board adoption of the watershed plan will not set into motion automatic implementation of projects, programs, initiatives, or policy recommendations.
- The Watershed plan is a conceptual master-list of non-structural programs and structural capital projects. Each fiscal year, staff will prepare and submit to the Board a detailed spending plan to include a description of proposed projects and an explanation of their ranking, based on specific criteria, such as the cost-effectiveness as compared to alternative projects, a clear public benefit, a need to protect public or private lands from erosion or flooding, and a need to meet a specific watershed or water quality goal.
- Road projects not related to protection of streambeds or banks or water quality will not be funded out of the stormwater and watershed budget.

Fairfax County Watershed Planning Program Schedule, January 2006

Project	Start	Completion	% Complete
Little Hunting Creek	Dec-02	Dec-04	100
Popes Head Creek	May-03	Oct-05	100
Cameron Run	Jun-03	Apr-06	70
Cub Run/Bull Run	Oct-03	May-06	65
Difficult Run	Jan-04	May-06	60
Pimmit/Bull Neck/Scotts/Dead/Turkey	Aug-04	Jun-06	50
Program Evaluation	Mar-05	July-05	100
Little Rocky Run/Johnny Moore Cr.	Apr-06	Nov-07	NA
Pohick Creek	May-06	May-08	NA
Accotink Creek	May-06	May-08	NA
Four-mile Run	Jul-06	Feb-08	NA
Sugarland Run/Horsepen Creek	Sep-07	Jul-09	NA
Pond Branch/Nichol Run	Sep-07	Jul-09	NA
Dogue Creek	May-08	Dec-09	NA
Belle Haven	May-08	Dec-09	NA
Kane Creek/High Point/ Old Mill/Wolf/Ryans/Sandy/Occoquan	May-08	Dec-09	NA

The County's 30 watersheds are grouped into 14-15 watershed planning projects.



County of Fairfax, Virginia

To protect and enrich the quality of life for the people, neighborhoods and diverse communities of Fairfax County

March 29, 2022

Mr. Steve Bieber
Water Resources Program Director
Metropolitan Washington Council of Governments
777 North Capitol Street NE, Suite 300
Washington, DC 2002

Ms. Amber Metallo
Biologist/Study Manager
U.S. Army Corps of Engineers
Baltimore District, Planning Division
2 Hopkins Plaza
Baltimore, MD 21201


Subject: MWCOG/USACE Coastal Storm Risk Study Tentatively Selected Plan

Dear Mr. Bieber and Ms. Metallo:

On behalf of Fairfax County, I am writing to express support for the proposed levee and floodwall improvements in Belle Haven. It has been determined that these improvements will have a favorable benefit/cost ratio among the various alternatives considered for reducing flood risks in tidal areas of our region.

It is my understanding that the next step would be to include the levee and floodwall project in the Tentatively Selected Plan (TSP) which would then be carried forward for further evaluation. It is also my understanding that you anticipate the TSP to be released for public comment in the late May 2022 timeframe. My team looks forward to working with you to facilitate and assist with any community meetings you expect to hold as part of the public input process.

Sincerely,


Bryan J. Hill
County Executive

cc: Rachel Flynn, Deputy, County Executive
Christopher Herrington, Director, Department of Public Works and Environmental Services (DPWES)
Eleanor Ku Coddling, Deputy Director, DPWES, Stormwater and Wastewater Divisions

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County of Fairfax, Virginia

MEMORANDUM

DATE: JUN 15 2020

TO: Board of Supervisors

FROM: Bryan J. Hill
County Executive *J Hill*

SUBJECT: Flood Mitigation Partial Tax Exemption (Code of Virginia 58.1-3228.1)

Introduction:

In August 2019, the Fairfax County Department of Public Works and Environmental Services (DPWES) and the Department of Tax Administration (DTA) convened a working group to evaluate the feasibility of a flood mitigation tax abatement program to help guide the Board of Supervisor's policy. The work group consisted of county staff from DTA, DPWES Stormwater Management, Land Development Services (LDS), Office of the County Attorney, Department of Management and Budget, Office of Emergency Management, and the Northern Virginia Soil and Water Conservation District. The group addressed the program's tax benefits to the property owners, administrative time and cost implications, and determined that a flood mitigation tax abatement program would not be economical to the property owner or county.

Background:

On March 21, 2019, the Virginia governor approved a bill allowing localities to provide a partial tax exemption from real property taxes for qualifying flood improvements on real estate that is subject to recurrent flooding (Code of Virginia 58.1-3228.1). Improvements may include flooding abatement, mitigation, or resiliency efforts that could range from smaller, less expensive efforts like window well covers and downspout extensions, to more substantial retrofits such as raising a basement areaway or regrading a lot to provide overland relief. The Code of Virginia identifies several criteria required to qualify for the partial tax exemption. The property must be subject to recurrent flooding. Qualifying flood improvements cannot increase the size of any impervious area and must primarily benefit one or more structures. The structure must also have been completed prior to July 1, 2018, or constructed more than ten years prior to the flood improvement.

While some Virginia localities are exploring the partial tax exemption, the working group was unable to confirm that any other municipality had or was in the process of adopting an ordinance.

Program Feasibility:

Staff believe a logical structure for a flood mitigation tax abatement program would mirror the existing Solar Tax Abatement Program (Solar Program). Established in 2015, the Solar Program is run by LDS and DTA and has processed over 122 applications for a total of over \$40,000 in tax credits through 2019. The Solar Program offers a five-year tax exemption where the exemption value is based on the cost or a percentage of the cost of the solar equipment and installation. Tax exemption qualifications include an application, building permit, plan documents, and cost documentation. The tax exemption is based on the annual property tax rate per \$100 assessed value. The exemption value is then converted to a tax credit and deducted from the property tax bill every year for five years.

Using the tax exemption credit calculations established by the Solar Program, the flood mitigation tax abatement program provides minimal financial savings. For example, if a homeowner were to incur flood improvement costs of \$25,000, using a tax year 2019 base tax rate of \$1.15 per \$100 of assessed value would result in a \$287.50 annual savings over a five-year period for the taxpayer. Assuming a constant base tax rate, this equates to \$1,437.50 or 5.75 percent of the total project cost over a five-year duration. While the flood mitigation property tax deduction would help reward owners who take proactive measures to reduce the risk of flooding to their properties, the group believes that the financial savings alone are not substantial enough to incentivize floodproofing a property.

This minor financial benefit would be reduced by the additional fees associated with county costs to administer the flood mitigation tax abatement program. In addition, a certification from a professional engineer or surveyor would be needed to ensure the improvements would protect the structure from the 100-year storm and would not have a deleterious effect on adjacent properties. The cost of the certification would likely negate the small benefit of the partial tax exemption.

In addition to the applicant costs associated with the design certification, there is an administrative burden on the county to verify the flood mitigation project is constructed. Under the Solar Program, the taxpayer submits the program application and documentation to LDS for review. After the review, LDS forwards the application and supporting documentation to DTA. DTA appraisal staff will typically make a field visit to the property to verify the solar equipment is in place before processing the application. The application review process is simple because solar installations require a building permit. LDS staff verify that the property listed in the application has an approved building permit and all required inspections are completed. DTA staff perform a drive-by site visit to confirm the solar panels are installed. Many of the flood mitigation practices that qualify for the flood mitigation tax exemption may not require an approved plan or permit and LDS inspections during construction. The county would confirm the program applicant completed the flood improvements by conducting a site visit and confirming the flood improvements match the application. Implementation of the program would require staff training and time for site visits. Staff costs to process applications and verify that the improvements are installed would likely exceed the benefits of the program.

Based on the program qualifications and minimal financial benefits, it is believed that the number of taxpayers who would apply for the flood mitigation tax abatement program is very limited. The Solar Program is available countywide and encompasses a much larger pool of potential applicants, but only received 59 applications last year. The flood mitigation partial tax exemption recurrent flooding qualification significantly limits the number of properties that can apply for the tax abatement program. Based on the Solar Program applications, staff assumes less than five taxpayers a year would apply for the flood mitigation tax abatement program.

Conclusion:

In conclusion, the limited applicant pool and minimal financial benefits coupled with the cost to certify floodproofing projects would hinder taxpayer interest in a flood mitigation tax abatement program. The administrative burden of implementing the program would also likely cost the county taxpayer more than the minor value created by the tax abatement.

cc: Rachel Flynn, Deputy County Executive
Randolph W. Bartlett, Director, Department of Public Works and Environmental Services
Jay Doshi, Director, Department of Tax Administration