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TO: The Honorable Christopher P. Stolle, Chair, Joint Subcommittee to
Formulate Recommendations to Address Recurrent Flooding

A handwritten signature in black ink that reads "Jeffrey D. Stern".

FROM: Jeffrey D. Stern, Ph.D.

SUBJECT: Recommendations Regarding Floodproofing

On behalf of Secretary of Public Safety and Homeland Security Brian Moran, pursuant to the 2015 Appropriation Act – Item 376.05, I'm submitting this report on the recommendations regarding recurrent flooding.

JDS/bcf

Enclosure

cc: The Honorable Brian Moran, Secretary of Public Safety and Homeland Security
Adam Thiel, Deputy Secretary of Public Safety and Homeland Security
Division of Legislative Automated Systems

“Working to Protect People, Property and Our Communities”

SECRETARY OF PUBLIC SAFETY AND HOMELAND SECURITY

Recommendations Regarding Floodproofing

Budget Item 376.05 #1c

December 2015

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Preface

In accordance with Budget Item 376.05 #1c, a working group was convened to study floodproofing needs and funding mechanisms. Budget Item 376.05 #1c reads as follows:

The Secretary of Public Safety and Homeland Security, in consultation with the Director, Department of Emergency Management, the Executive Director, Virginia Resources Authority, and the Director, Department of Housing and Community Development, shall review and make recommendations regarding the provision of flood-proofing grants and loans to private property owners and businesses, provide an estimate of the magnitude of current flood-proofing needs, and provide estimates of annual amounts needed to address flood-proofing needs. The Secretary shall report the findings and recommendations of this review to the Joint Subcommittee to Formulate Recommendations to Address Recurrent Flooding no later than December 1, 2015.

A working group comprised of members of the Office of the Secretary of Public Safety and Homeland Security, the Virginia Department of Emergency Management, the Virginia Resources Authority, the Department of Housing and Community Development, and the Department of Conservation and Recreation was established to meet this request. This report details the working group's findings and recommendations.

The Secretary wishes to thank the following subject matter experts who participated in this working group:

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Executive Summary

FEMA defines floodproofing as “any combination of structural and non-structural additions, changes, or adjustments to structures, which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.”¹

By minimizing flood danger, insurance claims may be reduced, as well as direct costs to the Commonwealth that result from emergency response and displacement, and indirect costs like losses to Virginia’s economy, disruption of communities, and the cost of premiums paid by Virginia residents.

There are currently no programs to fund private sector flood risk reduction on an annualized basis, but there are several grant programs that may be leveraged to reduce risk. These include: FEMA grants, Small Business Association loans, Community Development Block Grants (CDBG), and the Dam Safety, Flood Protection and Assistance Fund.

Virginia property owners may be significantly under-insured due to failure to participate in the National Flood Insurance Program (NFIP) but exact data was not readily available to the working group.

Based on the current situation in Virginia, the following recommendations are made for the consideration of the Joint Subcommittee to Formulate Recommendations to Address Recurrent Flooding:

1. Better identify properties with a high flood risk exposure and prioritize eligible project activities based on available funds.
2. Establish a revolving loan fund through the Virginia Resource Authority (VRA) to be made available to local governments.
3. Identify funding sources to establish a Recurrent Flood Risk Reduction Program.

¹ 44 C.F.R. § 59.1 (2010).

I. BACKGROUND

Flooding is the number one natural disaster event in all of the United States and in Virginia itself. It is the most frequent natural event and it causes the greatest economic impact. In Virginia, flooding occurs multiple times each year. Every jurisdiction in Virginia experiences some type of flooding, whether from coastal storms or short-duration, high-intensity rainfall events. In addition, the Commonwealth also faces recurrent flooding from sea level rise.

The risk exposure from recurrent flooding affects more than residential and business structures. It also affects private and public infrastructure such as roads and utilities, publicly owned recreation areas, and existing natural resources that function to reduce flooding impacts. In recognition of these issues, a greater effort has emerged in recent years to manage the exposure to flood risk. This report is part of that effort.

II. DEFINITIONS

FEMA defines floodproofing as “any combination of structural and nonstructural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.”² However, the focus of this definition, and the focus of the National Flood Insurance Program (NFIP) in general, is on reducing or insuring direct flood damage costs, not indirect costs. The NFIP target of flood damages only takes into consideration the impacts of flooding events to structures and, when insured, the property owner’s contents. It does not take into consideration items such as loss of business, community continuity, or the increased vulnerability of at-risk populations. The focus of floodproofing should therefore encompass the larger issue of minimizing flood risk exposure to reduce both the direct and indirect costs of flooding.

For the purposes of this report, floodproofing, or flood risk reduction, encompasses the following:

- **Acquisitions:** Including both removal and relocation of structures.
- **Elevations:** Elevating a property above the Base Flood Elevation (BFE). The BFE is the computed elevation to which floodwaters are anticipated to rise to during a 100-year flood.
- **Dry floodproofing:** Minimizing the potential for flood damage by reducing the probability that the building interior will be inundated. Some examples of dry floodproofing measures include:
 - *Continuous impermeable walls.* Sealing the building’s exterior walls using technologies that include impermeable waterproof membranes and potentially strengthening those walls.

² 44 C.F.R. § 59.1 (2010). *See also*, Federal Emergency Management Agency, *Floodproofing*, <http://www.fema.gov/floodproofing> (last visited Nov. 23, 2015).

- *Flood resistance in interior core areas.* Critical core components and areas can be made flood-resistant when dry floodproofing the entire building footprint is not needed or possible.
 - *Sealants for openings.* Sealing openings, such as doors, windows, and utility penetrations, and sealing walls and slabs, which are rarely designed to be watertight or resist flood loads.
 - *Flood shields for openings in exterior walls.* Watertight structural systems that close the openings in a building's exterior walls to the entry of water.
 - *Backflow valves.* Prevent floodwater flow into the building because of blockages in the sewage system.
 - *Internal drainage systems.* Primary method of removing water that may seep through small fissures and pathways in the protection system.
- **Wet floodproofing:** Preventing or providing resistance to damage from flooding while allowing floodwaters to enter the uninhabited portion and exit. Wet floodproofing “does not reduce flood insurance premium rates on residential structures.”³
 - *Flood-resistant materials.*
 - *Properly anchoring the structure.*
 - *Installation of flood vents.* Allows crawl space, garage, basement (in certain circumstances), agricultural buildings, etc., to allow the free flow of water through a structure.
 - *Elevation of utilities.* Move the utilities above base flood elevation, allowing surrounding area(s) to flood.
 - *Watertight cores.* Installing a watertight wall around items within the building that are particularly susceptible to flood damage.
 - *Contingent measures.* Contingent floodproofing measures are those that require some type of installation, activation, or other preparation immediately prior to the occurrence of a flood. These measures include flood shields, watertight doors, and moveable floodwalls. In some cases, flood protection provided by levees, floodwalls, or waterproof cores will require access openings that must be sealed with shields or doors during flood events.
- **Flood walls** (permanent): A static vertical structure constructed of man-made materials with an anchored foundation designed to block flood waters from reaching a building. A flood wall may be used for either a single structure or multiple structures.
 - **Levees** (permanent): A large static vertical structure typically constructed with a combination of man-made and natural materials designed to block flood waters from reaching a structure(s). A levee is typically used to protect multiple structures.
 - **Flood gates** (automatic and manual): A closure mechanism designed and implemented as part of an overall, larger system used to reduce or impede the natural flow of water along an existing waterway.

³ Federal Emergency Management Agency, *FEMA 551: Selecting Appropriate Mitigation Measures for Floodprone Structures* 6-1 (2007), available at http://www.fema.gov/media-library-data/20130726-1609-20490-5083/fema_551.pdf.

Any work done to repair, rebuild or replace residential or commercial buildings must comply with the Uniform Statewide Building Code (§ 36-97 et seq.) and local flood plain regulations adopted as a condition of participation in the National Flood Insurance Program, and in accordance with the objective to reduce NFIP-based flood insurance costs.⁴

III. PROVISION OF FLOODPROOFING GRANTS AND LOANS TO PRIVATE PROPERTY OWNERS AND BUSINESSES

Currently, there is no source of annual funding at the state or federal level dedicated to reducing flood risk on private or public properties. There are, however, opportunities to utilize other loans and grants for this purpose.

FEMA GRANTS

Grants available from the Federal Emergency Management Agency (FEMA) have restrictions on availability.

- The Hazard Mitigation Grant Program (HMGP) and Public Assistance (PA) grants are only available after a Presidential Disaster Declaration. In the case of HMGP, a formal request from the Governor to the President must be made in order for the funding to be potentially available.
- The Flood Mitigation Assistance (FMA) Grant Program and the Pre-Disaster Mitigation (PDM) Grant Program are nationally competitive programs that are only available to eligible subgrantees such as local governments and planning district commissions. As property owners are individually ineligible for these federal grants, eligible subgrantees would have to sponsor them.
- The Increased Cost of Compliance Coverage program allows flood insurance policyholders in special flood hazard areas to receive up to \$30,000 to help pay the costs to bring their home or business into compliance with their community floodplain ordinance. It is only available after the structure has suffered sufficient flood damages.

SMALL BUSINESS ADMINISTRATION (SBA) LOANS

SBA disaster loans can include money for mitigation to both businesses and homeowners.

A general 7(a) SBA business loan may be obtainable for structural mitigation for businesses only. The cost of these loans could potentially be partially off-set by the decrease in flood insurance costs, cost for other business or inventory insurance, and by an increase in the value of the structure post-mitigation.

SBA 504 loans may also be available. A key component of the SBA 504 loans is the ability to show that the action is conforming to a public policy, such as “business district revitalization.” Mitigation, with its structural improvement aspect, could be a component of an overall business district revitalization plan.

⁴ Va. Code Ann. § 15.2-2307 (2014).

FEDERAL COMMUNITY DEVELOPMENT BLOCK GRANT

Community Development Block Grant (CDBG) are funds passed through the Virginia Department of Housing and Community Development to localities and can be used for mitigation, but the fund usage must also meet CDBG criteria, which specifies that the funds must be targeted to low-to-moderate income communities and have positive economic development impacts.

DAM SAFETY, FLOOD PROTECTION AND ASSISTANCE FUND

The Director of the Department of Conservation and Recreation may make grants or loans to any local government for the purpose of assisting the local government in the development and implementation of flood prevention or protection projects, or for flood prevention or protection studies defined as the construction of dams, levees, flood walls, channel improvements or diversions, local floodproofing, evacuation of flood-prone areas or land use controls which reduce or mitigate damage from flooding. Historically, these funds have been used to assist private dam owners with improvements to those structures.

IV. ESTIMATE OF FLOODPROOFING NEEDS

Based on the best currently available NFIP data, as provided to the Virginia Department of Emergency Management (VDEM) and mapped using parcel points from the Virginia Geographic Information Network (VGIN), the Commonwealth has approximately 124,000 address locations identified as being within a special flood hazard area (SFHA).⁵ The area within a SFHA is where the NFIP's floodplain management regulations must be enforced and where the mandatory purchase of flood insurance applies. Within Virginia's SFHA, it is estimated that only 36 percent of the properties are identified as carrying flood insurance.

According to NFIP data, as provided by the Department of Conservation and Recreation through a Community Information System search, as of the beginning of November 2015 approximately 110,000 NFIP flood insurance policies are currently active in Virginia. These flood insurance policies provide a coverage value (property and contents) of approximately \$27.6 billion.⁶

According to the FEMA NFIP Policy and Claims Report for Virginia, since 1978 approximately \$633 million has been paid out in 44,000 flood insurance claims. On an annualized basis, approximately \$17.1 million was paid to insured property owners by the NFIP. However, this payment is only for structural repair and (in some cases) some contents of the damaged structure. This figure does not capture the deductible paid by the homeowner, does not consider the loss of income to a business, and does not capture emergency response or displacement costs.

With respect to the flooding risks associated with hurricanes, storm surge created by a combination of high tides and high winds poses a significant risk. VDEM uses a Category Four storm surge for planning purposes and maps the projected impacts accordingly. Using the same data sources as described above, an identified 472,779 address points fall inside a Category Four storm surge zone. Of those properties, 401,003 are not in a SFHA. This means that those

⁵ The estimated value of these properties is unknown.

⁶ No documentation source is available for non-federally backed insurance policies.

properties are not subjected to the NFIP's floodplain management regulations even though they are at risk of coastal flooding. These properties need to take measures to reduce their risk of flooding.

By comparing the population of geocoded NFIP policies to the VGIN identified address points, Virginia can determine that of the total 472,779 properties in the storm surge zone, 61,771, or 13 percent, appear to have flood insurance. Of the 401,003 storm surge properties that are not in a SFHA, 31,200, or 7.7, percent are insured properties. Based on these two pieces of data, Virginia property owners are vastly under-insured against the risk of storm surge; efforts to promote NFIP participation should be increased.

The information sources discussed above are currently the only data available to assess Virginia's floodproofing needs. Analyzing Virginia's needs solely on flood insurance policies paints an incomplete picture. Better information is needed to further identify properties at high risk of flooding, regardless of insurance policies. Without additional data, it was beyond this working group's ability to estimate the costs of floodproofing for private property.

V. RECOMMENDATIONS

Recommendation 1

Better identify properties with a high flood risk exposure and prioritize eligible project activities based on available funds.

Given the magnitude of this issue, localities should be taking advantage of all the funding opportunities available to their residents. This currently is not the case. All localities should understand where the neighborhoods and buildings most vulnerable to flooding are within their community. Localities need assistance in identifying and valuing flood risk. This effort would provide for a more accurate and better analysis of needs and opportunities, which would allow for a better targeting and use of flood risk reduction funding. Where possible, the application for and use of federal funding can result in loss avoidance for the private property owners, as well as functional loss avoidance via decreased resource needs for the locality.

Suggested funding priorities and criteria, in alignment with the Department of Housing and Urban Development standards, should include:

- Targeting properties with the greatest flood risk exposure to achieve the greatest reduction in risk exposure.
- Prioritizing communities with the greatest fiscal stress as identified by the Department of Housing and Community Development fiscal stress index.
- Requiring applicants to obtain and carry flood insurance to reduce uninsured flood damage claims in the future.
- Prioritizing communities currently participating in or working to participate in the Community Rating System (CRS).⁷

⁷ Jurisdictions participating in the CRS as of 2014 include: Accomack County, City of Alexandria, Arlington County, Town of Bridgewater, Town of Cape Charles, Town of Chincoteague, Fairfax County, City of Falls Church,

- The Community Rating System (CRS) is a NFIP floodplain management program designed to provide some guidelines and opportunities for localities to reduce flood risk. It consists of four basic categories of actions with nineteen activities. The four action categories are: Public Information; Mapping and regulations; Flood Damage Reduction; Warning and Response. Activities within these categories are assigned points. The larger the number of points accrued, the lower the presumed flood risk to the community. Participation in the CRS provides a direct benefit to every policy holder in the jurisdiction via lowered flood insurance costs. Dependent upon the participation level of the locality, these flood insurance deductions can range from 5 percent to 45 percent of current cost.
- There are CRS programmatic components which discourage localities from participating. These include: higher structural and land use regulatory requirements within the floodplain; the real or perceived loss of economic development opportunities; the direct costs associated with the implementation of the program activities.

Recommendation 2

Establish a revolving loan fund through the Virginia Resource Authority (VRA) to be made available to local governments.

The Virginia Resources Authority provides innovative, cost-effective and sustainable financial solutions to build vibrant and healthy Virginia communities. Created by the General Assembly in 1984, VRA supports community investments for floodproofing and dam safety.

The specified use of this fund will be to support the structural floodproofing needs of private homeowners and businesses. It is neither designed to supplement nor supplant the Dam Safety, Flood Prevention and Protection Assistance Fund, which is principally designed to assist private dam owners with bringing their dams up to current standards.

The local governments may, in turn, decide to provide either loans, grants, or both to property owners. Regardless of the choice the local government makes, it is then incumbent upon the local governments to directly repay the VRA.

Recommendation 3

Identify funding sources to establish a Recurrent Flood Risk Reduction Program.

Virginia should identify additional funding sources to establish a Recurrent Flood Risk Reduction Program. Funding should support program management, community education to promote insurance and risk reduction strategies, and loans for projects.

Gloucester County, City of Hampton, James City County, Loudoun County, City of Norfolk, City of Poquoson, City of Portsmouth, Prince William County, City of Roanoke, Roanoke County, Stafford County, Town of Vienna, Town of Wachapreague, and York County.

VI. CONCLUSION

Virginia needs to better identify properties with a high flood risk exposure. Dedicating resources to this effort would provide for a better, more accurate analysis of needs and opportunities. Encouraging local governments to assess the needs within their jurisdiction is the first step towards reducing Virginia's flood risk. Once the risks are known, localities can determine what available federal and state funding could be received and be applied towards reducing the risk. As it currently stands, there is no source of annual funding dedicated to reducing flood risk on private property. Sources should be identified to establish and fund a Recurrent Flood Risk Reduction Program in order to reduce this gap and fulfill Virginia's floodproofing needs.