

US Army Corps  
of Engineers  
Baltimore District

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# HUNTINGTON FLOOD DAMAGE REDUCTION STUDY

## FAIRFAX COUNTY, VIRGINIA

### FINAL REPORT MAIN REPORT AND APPENDIX A – APPENDIX F

### APRIL 2009

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*Prepared for:*

Fairfax County Stormwater Planning Division  
Department of Public Works and Environmental Services  
12000 Government Center Parkway, Suite 449  
Fairfax, Virginia 22035-0052

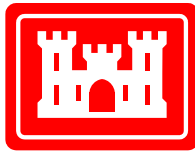
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FINAL REPORT  
APRIL 2009

## EXECUTIVE SUMMARY

The Huntington Flood Damage Reduction Study was conducted by the U.S. Army Corps of Engineers (Corps), Baltimore District, at the request of the Fairfax County Stormwater Planning Division, under the Floodplain Management Services Program (FPMS). The FPMS Program provides authority for the Corps to assist county governments with floodplain information and planning assistance. The study was fully funded by Fairfax County, who voluntarily contributed funds to the program. This study was not conducted through the Corps' civil works program, which is used for projects that may ultimately lead to federal construction. Therefore, it does not include NEPA documentation, or other federal requirements such as external technical review.

Significant flooding occurred in the Huntington Subdivision along Cameron Run in Fairfax County, Virginia on June 25 and June 26, 2006. Approximately 160 houses were flooded. Based on the Corps' most recent hydraulic model, there are 180 houses in the Huntington and Huntington Station communities that are located in the 1% annual chance floodplain (100-year floodplain) and are at risk of flooding again in the future. The purpose of this study was to develop and evaluate alternative solutions for mitigating future flooding and to select a final plan for implementation. The flood damage reduction measures that were evaluated include a levee, dredging, buyouts and flood proofing individual buildings.

The flood damage reduction alternatives underwent a three-phase plan formulation process and a public involvement process which led to the selection by Fairfax County and design of a final accepted plan. Concept plans were developed for each of the alternatives and they were evaluated based on how well they mitigated flooding, construction costs, economic benefits (reduction in future damage costs), impacts, risk, and public acceptance. None of the alternatives had an economic benefit-to-cost ratio greater than 1.0, which is required to meet the guidelines for federal funding. The most cost-effective solution that would solve the flooding problem and meet the established project goals and objectives is Final Concept Plan 2C, the construction of a levee. Fairfax County selected this plan for implementation and requested that the Corps conduct further design of the project.

The main components of the selected plan are a levee and a pumping station. As part of this study, the Corps developed the levee to a 65% design level. Further design of the levee will be required to take it to a 100% level so that it may proceed to construction. The Corps does not have the authority under the FPMS program to prepare final designs of flood damage reduction projects. Even if this project was being studied under the Corps' civil works program, the Corps would not have been able to complete the final design because it does not meet the Corps' economic justification requirements needed to proceed forward with the project. Per the scope, the Corps only designed the pumping station to a concept level design stage. This concept plan allowed the team to develop an approximate construction cost estimate. However, significant further design will be required for the pumping station and the accompanying features (such as the flow diversion pipes).

The grassed levee is 2,865 feet long and will tie into high ground upstream and downstream of Huntington. The project is designed to prevent flood damages to the Huntington houses during the 1% annual chance flood event and lower events. The top of the levee will be approximately 10 to 15 feet above the existing ground. The crest elevation at the upstream end of the levee is 19.4 feet (4 feet higher than the 1% annual chance flood elevation); the crest elevation at the downstream end is 17.3 feet (3 feet higher than the 1% annual chance flood elevation). The additional height above the 1% annual chance flood elevation is to allow for risk and uncertainty and sea level rise. Based on the risk and uncertainty analysis, the probability that the levee will not be overtopped during a 1% annual chance event is 99%. The levee height meets FEMA certification standards, however there are other criteria that FEMA would require before the levee could be certified. The levee has a 10-foot wide crest and 1 vertical on 2.5 horizontal side slopes. There is an asphalt recreational path along the top of the levee and ramps that lead over the levee for maintenance and handicap access.

The project also includes excavating part of the open space/park area adjacent to the levee approximately 1-2 feet deeper to elevation 6.0 feet to allow for more rainfall storage during a flood event. A pumping station with a capacity of 100,000 gpm will be necessary to pump the interior drainage across the levee to Cameron Run during a flood event. During a high water event (when the storm drains through the levee are closed) and a 100-year rainfall, the pump station will maintain a maximum pond elevation in the community of 8.0 feet. There would still be some water ponding in the roads and in yards.

Based on hydraulic modeling, the levee will increase the 1% annual chance flood elevations by up to 0.6 feet just upstream of the project. The increase in flood elevations extends upstream to Telegraph Road. This increase will affect four structures just upstream of Huntington. However, two of them have low openings above the 1% annual chance flood, so the levee will have no impact. The other two buildings (Mid-Town High Rise and Huntington Car Care) are already located in the floodplain and would be flooded during a 1% annual chance flood even without the levee.

The project will have an impact to wetlands and forest habitat, however these impacts have been minimized. Approximately 0.02 acres (935 square feet) of palustrine forested wetlands will be impacted by the construction of the project. As a result of levee construction there will be permanent direct adverse impacts to existing flora due to removal of mature trees, saplings, shrubs and other established vegetation along the levee alignment and the 15 foot easement on either side. Approximately 4.85 acres (231,930 square feet) will be impacted. These areas will be seeded and converted to grassy areas. The park area will also be impacted by the project. Due to the excavation of the park area for interior drainage, recreational use of this area may be limited.

The total project cost, including the final design phase, construction management, lands and easements, and escalation (assuming construction will take place between FY11 and

FY13), is estimated to be \$20.2 million. The benefit to cost ratio is 0.4. The project construction duration is estimated to be 2 years.

The next phase of the project is the final design of the levee and pump station. In addition to further design, the county will need to obtain the necessary permits and approvals and secure funding prior to construction.

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