

**Four Mile Run
Application for U.S. Environmental Protection Agency Grant**

July 18, 2001

WORK PLAN

Project to Develop a Joint Plan of Action to Improve the Condition of Lower Four Mile Run

The Four Mile Run watershed incorporates an area of approximately 20 square miles in the Virginia jurisdictions of Arlington County, the City of Alexandria, Fairfax County and the City of Falls Church and is home to approximately 183,000 people (NVRC figures). This watershed, located just south of Washington, D.C., empties into the Potomac River which eventually drains to the Chesapeake Bay. Due to seven major flood events in the 1960s and early 1970s, Congress authorized the U.S. Army Corps of Engineers to design and construct a flood control channel in this rapidly urbanizing watershed. The flood control channel begins at the mouth of the Four Mile Run and continues upstream 2.3 miles. The portion of Four Mile Run used as a flood control channel also serves generally as the jurisdictional boundary between Arlington and the City of Alexandria.

The Army Corps of Engineers flood control project channelized, widened and armored lower Four Mile Run with rock gabions and concrete, and Arlington and Alexandria agreed to keep all vegetation cleared from the stream banks to ensure adequate capacity for flood control. The result of these modifications and management actions has been a loss of both aquatic and riparian habitat.

Arlington and Alexandria citizens participating in local development projects in the vicinity of the flood control channel recently began to discuss potential improvements in flood control management, as well as environmental and aesthetic enhancements. Residents of both jurisdictions worked with County and City staff to request funding from Congress to study possible improvements to the channel that were not considered in the original, single-purpose project.

Arlington County and the City of Alexandria are seeking the funds appropriated by the U.S. Congress to the U.S. Environmental Protection Agency for "demonstration of environmental improvements to Four Mile Run" (Conference Report on H.R. 4635, #92.) The purpose of the project is to prepare a design and engineering study for the restoration of this urban stream, to develop strategies and policies for management of future growth in the watershed, and to undertake a physical demonstration project of proposed environmental improvements. Goals for this project are to plan for flood control, to enhance environmental conditions and riparian habitat along Four Mile Run, to protect the Potomac River and the Chesapeake Bay, to enhance the aesthetics of the channel, to

integrate the design of the channel with surrounding communities and proposed urban development adjacent to Four Mile Run, and to develop upstream strategies to maintain the long-term viability of flood control measures and environmental quality. This project is expected to be a model of multi-jurisdictional economic and environmental cooperation, as well as a model of planning, design and engineering to optimize safety, environmental and aesthetic concerns.

The study will be undertaken by a multi-disciplinary team of nationally renowned specialists, who have demonstrated experience and innovation in the restoration of highly modified, channelized, urban streams. The consultant team will be selected through a Request For Proposal process undertaken by a joint selection committee from Arlington County and the City of Alexandria. The consultant team will include the following disciplines: water resources engineers and modeling experts, urban planners, landscape architects, civil engineers, urban stream and wetland restoration specialists, biologists, and other support disciplines as required.

Two work groups comprised of citizens and staff will be created to review and guide the study through the phases outlined below. Each work group will be chaired by one Arlington appointed citizen and one Alexandria appointed citizen and supported by staff.

Timeline and Phasing

Phase I - Preparation of Proposal and Selection of Consultant Team

Estimated January 1, 2002 - April 30, 2002

Request for Proposal will be prepared. An independent consultant, who will not participate in the work of the study, may be used to help prepare the Request for Proposal. Proposals will be evaluated, and the consultant team will be selected.

Phase II - Data Collection, Analysis and Identification of Opportunities

Estimated May 1, 2002 - April 30, 2003

1. Hydrology / Hydraulics Work Group

- a. Determine the current capacity of the channel. Review historical plans, literature files, and databases for Four Mile Run; directly measure conditions, including stage and discharge characteristics of the channel and current channel profiles; collect field data; analyze data; and develop a computer model of the existing hydrology that could incorporate the modeling expertise of the Northern Virginia Regional Commission.

- b. Study the entire watershed and estimate the likely flow of the channel at maximum future build out, using existing patterns of development, current zoning, existing stormwater management and detention requirements, and any hydrologic analyses that have already been conducted by Arlington County and City of Alexandria staff.
 - c. Evaluate the hydrology of the channel based on a range of possible maintenance strategies such as periodic dredging of the channel.
 - d. Review the current capacity, future watershed build out data, and maintenance implications with the Army Corps of Engineers and the Northern Virginia Regional Commission. Determine flood levels for the 100-year storm based on current data, and identify appropriate engineering opportunities and constraints for redesign of the channel and flood management program.
- Deliverables for this portion of the work include a computer model, draft report and a final report of findings.

2. Environmental / Urban Design Work Group

- a. Gather information and case studies of similar, innovative stream restoration projects throughout the country. Study successful examples of engineering, planning, improvement of riparian and aquatic habitat, watershed management programs and policies, and implementation strategies.
 - b. Evaluate existing physical conditions along the channel. Evaluate current and proposed development patterns and land uses, zoning, park and trail connections, and existing environmental conditions.
 - c. Identify opportunities for restoration and redevelopment along the channel, including appropriate land uses, open space initiatives, the urban and natural design character of the channel, recreational activity and connections to trail systems, improved aesthetics, and aquatic and riparian enhancements.
 - d. Examine existing site and stormwater management policies in the watershed and make recommendations to enhance those policies relative to new development and possible retrofit of existing development.
- Deliverables for this portion of the work include a draft report and a final report of findings.

Work Groups would be comprised of appropriate parties such as the following:

Hydrology / Hydraulics Work Group

Representatives from:

Arlington County
City of Alexandria

Relevant stakeholders, including County and City commission members; property owners; local, regional and federal government representatives; and citizen representatives.

Environmental / Urban Design Work Group

Representatives from:

Arlington County
City of Alexandria

Relevant stakeholders, including County and City commission members; property owners; local, regional and federal government representatives; and citizen representatives.

Phase III - Design Synthesis

Estimated May1, 2003 - April 30, 2004

Based on the data collection, analysis, and identification of opportunities from Phase I, the Hydrology / Hydraulics Work Group and the Environmental / Urban Design Work Group shall work jointly in this phase to develop recommendations. The following tasks shall be performed in this phase.

1. Define engineering, design and environmental goals.
2. Develop conceptual options for engineering, design, and environmental improvements of lower Four Mile Run that take into consideration the Army Corps of Engineers requirements for storm channel capacity, sound environmental design, and the principles established in the Commonwealth Atlantic Property Urban Design Guidelines for Arlington and Alexandria. These guidelines govern the development of the Potomac Yards property, a large office/commercial/residential development project located on both sides of Four Mile Run, near the mouth of Four Mile Run.
3. Identify and assess growth management tools and opportunities, and broad watershed improvement strategies for further exploration by the local jurisdictions.
4. Obtain public input through a series of workshops and meetings to help shape the goals and proposed improvements.

5. Evaluate the input and identify a preferred option/strategy for engineering and design. Identify a project that can be built to demonstrate environmental improvements in the channel.
6. Share the proposal with the public through community meetings and Advisory Commission meetings.
7. Refine the preferred engineering and design option and proposed demonstration project.
 - a. Develop a hydraulic computer model of the existing channel and input proposed engineering and design recommendations into the model.
 - b. Develop preliminary design plans, sections, elevations, sketches, and/or photos to illustrate the proposed urban design and uses of the channel.
 - c. Develop recommendations for short and long term environmental improvements for the channel and watershed.
 - d. Identify and develop watershed management practices, policies and action strategies to reduce runoff and improve stream quality over the long term. Management practices and strategies identified in this phase should maintain the capacity of the channel at maximum future build out. Incorporate this information into the computer models and refine them as the design of the channel is being developed.
 - e. Identify channel maintenance requirements and strategies. Begin implementation of maintenance and management strategies as part of the demonstration project. Monitor and evaluate results for long term viability as possible solutions. Provide park management recommendations if necessary.
 - f. Prepare a short and long term implementation plan, including potential funding options and phasing.
8. Obtain the endorsement of proposals by the Alexandria City Council and the Arlington County Board as appropriate throughout this phase.
- Deliverables for this portion of the work include a computer model, a draft report summarizing the entire project and a final report.

Phase IV - Demonstration Project

Estimated May 1, 2004 - April 30, 2005

Based on the recommended demonstration project(s) from Phase III, prepare and deliver design and construction drawings and specifications for the project(s), obtain public input, develop a project budget and funding plan, prepare a timeline for implementation of the project, and construct the project. The completed project will be a physical demonstration of environmental, engineering and design improvements within the project boundaries. Implementation of early phases of maintenance and management strategies may occur during the Design Synthesis phase of the project.

Budget

As a consultant team will be chosen through a national selection process, it is hard to determine the exact dollar costs before completing the Request For Proposal process to obtain those consultant services. However, the purpose of the project can be broken into three main components: 1) prepare a design and engineering study for the restoration of lower Four Mile Run, 2) develop strategies and policies for future growth management and environmental improvements in the watershed, and 3) undertake a physical demonstration project of proposed environmental improvements.

The funding that Congress made available to the EPA was \$1,000,000. Arlington County and the City of Alexandria estimate a cost of \$700,000 for planning and consulting services for Phases I, II, and III and \$300,000 for planning and implementing the recommended demonstration project. If the services for Phases I, II, and III do not total \$700,000, all remaining funds will be added to the funding available for the demonstration project. The final cost for the demonstration project will be determined at the completion of Phase III. Throughout all phases of the project, Arlington County and the City of Alexandria will contribute supporting resources, including program management and time from staff, commission members and community representatives.

Estimated Expenses:

Phases I, II and III Services	\$700,000
Demonstration Project Cost (Includes design, construction management)	\$300,000
Total:	\$1,000,000