ARLINGTON COUNTY, VIRGINIA

County Board Agenda Item
Meeting of December 10, 2011

DATE: November 17, 2011

SUBJECT: Authorization to procure additional services and increase the contract amount under Arlington County Contract 558-12 with CH2M Hill for the continuation of the storm sewer capacity analysis and related stormwater management planning services.

C. M. RECOMMENDATION:

1. Approve additional services and an increase of $440,000 to Arlington County Contract 558-12 with CH2M Hill for continuation of the storm sewer capacity analysis and related stormwater management planning services for a total contract authorization of $2,140,000.
2. Authorize the Purchasing Agent to execute an Amendment to Contract No. 558-12, subject to review and approval of such document by the County Attorney.

ISSUES: County Board approval is needed to amend the Contract. No issues have been identified.

SUMMARY: The purpose of the requested authorization is to continue services with CH2M Hill for additional storm sewer capacity analysis and related stormwater management planning services in support of an update of the County's adopted *Stormwater Master Plan* under Arlington County Contract 558-12. At the September 26, 2009, County Board meeting, $1.3 million was initially authorized for this work and at the July 9, 2011, County Board meeting an additional $400,000 was authorized for this work. The storm sewer capacity analysis is currently underway on the Crossman Run, Lubber Run, Spout Run, Little Pimmit Run, Westover Branch, Roaches Run and Doctor's Branch watersheds using the $1.7 million currently authorized. The storm sewer capacity analysis currently underway will provide the location and length of pipes that are inadequate to carry the modeled flows. The requested additional $440,000 will provide funding to perform additional modeling to determine preliminary sizes and length of upgrades required to significantly reduce the risk of flooding within the selected watersheds. The modeling results will also be utilized for identifying and prioritizing future capital projects and will help refine the scope and cost estimates for storm sewer capacity projects to be considered as part of the County's Capital Improvement Program.

County Manager: BMD AMA

County Attorney: JAM

23.

Staff: Jeff Harn, Department of Environmental Services

BACKGROUND: Arlington County's *Stormwater Master Plan* was adopted in 1996. A subsequent *Watershed Management Plan,* focusing primarily on stream protection issues, was adopted in 2001. The update of the County's adopted *Stormwater Master Plan* is anticipated to be completed by the end of calendar year 2012 and will provide a comprehensive framework for stormwater infrastructure capacity upgrades, maintenance, and replacement/rehabilitation of existing infrastructure. The Plan will also include a coordinated strategy to set priorities for stream restoration and stormwater retrofit needs based on the community's environmental values. The benefit will be a stormwater management program that provides timely, cost-effective management, maintenance, and upgrades of stormwater infrastructure, that complies with all regulatory requirements, and that ensures public health and safety. The update will also reflect a state-of-the-art approach to watershed management that looks for opportunities to address both stormwater quantity and quality where feasible and cost-effective.

The County's storm sewer infrastructure, mostly built during the 1940's and 1950's, has begun to deteriorate and several catastrophic failures of corrugated steel culverts and storm sewer lines have occurred in recent years, resulting in threats to public safety, inconvenience to motorists during the repairs, and unanticipated capital costs totaling over $2 million. A major storm event in June 2006 generated over 300 reports of property damage due to flooding. In addition, the Virginia Soil and Water Conservation Board adopted new stormwater regulations in May 2011 that significantly increase the regulatory requirements affecting local stormwater management programs, due primarily to the intensive State and federal efforts to improve the health of the Chesapeake Bay. Mandatory regulatory requirements are also expected to increase substantially when the County's Municipal Separate Storm Sewer System (MS4) permit is reissued by the Virginia Department of Conservation and Recreation within the next year.

These factors led to a decision by the County Board in April 2008 to implement a Sanitary District tax to provide a dedicated source of funding to create a comprehensive stormwater management program. The Stormwater Management Fund, which was created to manage the revenues from the Sanitary District tax, provides funding for planning, design, construction, monitoring, and maintenance of capital projects to reduce the risk of flood damage. The Stormwater Management Fund also supports the County's watershed management programs and environmental compliance requirements to protect local streams, the Potomac River, and the Chesapeake Bay through a targeted stream restoration and stormwater quality retrofit program, as well as staffing to manage compliance with all regulatory requirements.

The storm sewer capacity analysis was initiated in November 2009 with CH2M Hill commencing work on a pilot watershed, Crossman Run. For each watershed**,** CH2M Hill provides a hydrologic and hydraulic model of the major storm sewer pipes. County staff elected to model major pipes 36 inches or greater in diameter after determining that including pipes smaller than this size would significantly increase the cost and time required to complete the stormwater capacity models for the major drainage basins. Future stormwater modeling, including information about any smaller diameter pipes necessary to design localized drainage solutions will be modeled by existing staff on an as-needed basis for individual projects during the design process.

Two storm events were analyzed in the model in order to evaluate existing capacity and to identify areas without adequate capacity. The next phase of the modeling process is to systematically upgrade the pipe sizes without adequate capacity until the entire system has adequate capacity for the two specified storm events. The complexities of the modeling software dictate that these upgraded pipe sizes be identified and optimized in an iterative fashion. Based on these modeling results, future stormwater capital projects will be identified in a systematic, cost-effective manner.

Within the Crossman Run project scope, CH2M Hill analyzed on a countywide basis the effects of sea level rise and global climate change on the system. CH2M Hill also completed an analysis of several rainfall distributions on the Crossman Run watershed to make an informed decision on the rainfall distributions to be utilized for analysis and design on all of the other watersheds. All of the countywide analyses have been completed and the focus is now on modeling the remaining individual watersheds.

During the modeling work in the initial pilot study area, it became clear that the current GIS database for the storm sewer network had large data gaps and required additional efforts by County staff to review and enter the data in the GIS database for CH2M Hill to proceed. In order to meet the scheduling goal, specific watersheds were targeted for detailed modeling. Selection of the watersheds was based primarily on locations of known flooding during the June 2006 storm event, and the amount of continuous pipe 36-inches in diameter and larger.

Of the 300 reports of property damage from the June 2006 event, almost two-thirds are located within six watersheds: Crossman Run, Westover Branch, Doctor's Branch, Little Pimmit Run, Spout Run, and Lubber Run. A seventh watershed, Roaches Run was also selected because of the anticipated redevelopment in the Crystal City area. It is anticipated that additional watersheds will be modeled by existing staff as resources are available on an as-needed basis, prioritized by the watershed characteristics, land use, and amount of 36-inch diameter and larger pipes within the watershed. For example, the Donaldson Run, Stohman's Run, Four Mile Run, and Palisades watersheds have very few continuous pipe runs that are 36-inches in diameter and larger as they mainly consist of open channel streams. The Cemetery/Pentagon and National Airport watersheds are composed of mainly federally controlled property and stormwater infrastructure.

DISCUSSION: Arlington County Contract 558-12 with CH2M Hill is a task-order contract to conduct a storm sewer capacity analysis. The Contract lists examples of the types of work it authorizes, including:

i) an evaluation of local historical rainfall data and a benchmarking comparison of stormwater infrastructure design criteria used in the region;
ii) an evaluation of the impacts of global climate change on future storm intensity, duration, and frequency;
iii) flooding and related impacts caused by projected sea level rise;
iv) hydrologic and hydraulic modeling of the storm sewer network to identify capacity constraints;

v) field verification of key stormwater infrastructure parameters required for modeling purposes (e.g., depth, slope, condition, etc.) and to update the County's GIS stormwater network database;
vi) assistance with community education and outreach efforts during the *Stormwater Master Plan* update process; and,
vii) various optional stormwater planning and analysis tasks are also identified in the scope of work that may be included in future task orders when appropriate.

The requested authorization will fund additional key technical work necessary to proceed with a planned update of the County's *Stormwater Master Plan*. This work will be done on a parallel track with the stream inventory work and watershed retrofit plans that are currently underway. Together, all these technical efforts will provide comprehensive information about the existing storm sewer network capacity, the condition of the County's stream network, and the potential to retrofit the County's storm sewer network to remove stormwater pollutants. When completed, this work will result in a long-range planning framework to address both current and future drainage and flood protection needs, watershed management initiatives, and environmental compliance objectives and requirements, while also supporting the County's vision of sustainability.

FISCAL IMPACT: The requested $440,000 for this additional modeling work will be funded by the Stormwater Management Fund (321.47211). No additional funds are anticipated to be required to complete the modeling efforts of the selected watersheds.