

**DATE:** April 17, 2007

**TO:** SEMSWA Board of Directors

**FROM:** Steve Gardner, P.E., CFM  
Director of Operations

**RE:** Cottonwood Creek Channel Restoration Project – Easter to Briarwood

For the last 15 years, Arapahoe County and the City of Centennial have been directing the implementation of the Cottonwood Creek Outfall Systems Plan (the Master Plan) through their respective land use processes. When the Master Plan was originally approved in 1991, it directed developers to use a series of regional detention ponds and channels to avoid the proliferation of many individual “on-site” detention ponds, a practice that is still encouraged by the Urban Drainage and Flood Control District (UDFCD) and most local governments. Rather than require each lot owner/developer to pay for the improvements along their property’s frontage, Arapahoe County and Centennial charged a system development fee that was calculated on the basis of the total cost for implementation of the regional components of the Master Plan divided by an estimate of the total impervious acres at buildout for the basin. In theory, each developer would pay their system development fee to satisfy their regional drainage impact on the system. In turn, the County and Centennial were then responsible for implementing the Master Plan to keep up with the pace of development. However, the fees charged weren’t enough to keep up with rising construction costs, they were always charged in arrears, and cash flow couldn’t keep up with the demand for regional system improvements. As a result, there are more improvements that need to be built than we have collected fees to pay for them. This project is the first of many to follow that will cause us to discuss the best way to keep pace with the need to build regional drainage infrastructure while maintaining adequate cash flows.

In 2005, a developer approached Arapahoe County regarding the commercial development of approximately 10 acres of land adjacent to Cottonwood Creek and Easter Avenue. To make his project economically viable, the developer was requesting permission to fill in a portion of the floodplain that was rendered ineffective flow area with the addition of the box culverts beneath Easter Avenue. This request triggered the need for a Conditional Letter of Map Revision (CLOMR) and the regional improvements for this reach of Cottonwood Creek. In December of 2005, Arapahoe County contracted with Moser & Associates for design engineering services associated with channel improvements to the ½-mile reach of Cottonwood Creek between E. Easter Avenue and E. Briarwood Avenue. As a result of unchecked developed flows, the channel is experiencing severe degradation and has 20- to 30-foot-high vertical, unstable banks in some areas. The channel in its current condition has little capacity within its banks and continues to erode over time due to the effects of development in the watershed.

The goals of the Cottonwood Creek Channel Restoration project are to:

1. Stabilize the channel and reduce velocities within the channel.
2. Provide 100-year flood capacity within the banks of the channel.

3. Protect existing infrastructure (S. Lima Street and several water/sewer lines).
4. Make the creek maintainable and seek UDFCD maintenance eligibility.
5. Avoid present and future safety hazards.

The proposed channel restoration project addresses the stability and flood capacity issues by installing three grade control structures, realigning a portion of the channel, and utilizing bioengineering measures to reinforce the channel banks. These enhancements to the channel will improve the health of the stream, make it easier to maintain, improve public safety, and provide an asset to the community.

Since the onset of the design engineering work, a great deal of coordination has been required to ensure success of the project. Arapahoe County has been working with the developer and the downstream landowners (Cooper Development) to coordinate the improvements with their development plans. The UDFCD has been heavily involved to offer advice on the proposed improvements and support the efforts of the project. Due to the nature of the work being done in the creek and the impact to wetlands, we have also been working with the Army Corps of Engineers to obtain a Clean Water Act 404 permit and provide improvements that are favorable to habitat. We are also working with FEMA to revise the floodplain due to the fill in the floodplain and to the changes in the creek hydraulics.

To be sure, the question of how to pay for regional improvements through system development fees is a key issue. Although requiring a developer to construct the improvements necessary to support their development may seem reasonable on the surface, a closer inspection of that requirement reveals several problems that are not easily solved. Regional infrastructure may first need to be built in a location that isn't necessarily adjacent to a single developer's property. Also, building regional facilities is beyond the means of most developers, even if they get reimbursed by future developments. Requiring developers to build infrastructure in a piece-meal fashion often results in projects that don't work together hydraulically, cannot be maintained easily (or at all), and that don't result in a finished product that enhances the community. For these and other reasons, most local governments have gone the way of regional improvements that are funded by system development fees.

Over the short term and the long term, SEMSWA is faced with the challenge of deciding how to collect and use system development fees in a way that provides for adequate drainage, flood control, and water quality, and that provides us a means of managing cash flow. For the short term, SEMSWA could continue to encourage larger developers to build these regional facilities for us, getting paid back over time by SEMSWA with system development fees (ACWWA did it this way). Although somewhat convenient, this method is not sustainable over long periods of time. Another option consists of using annual service charges (SEMSWA general fund) to pay the unfunded portion of a developer project, and pay ourselves back with system development fees over a period of time. For the long term, I recommend instituting a global system development fee that is calculated by adding up all of the development-driven infrastructure needs in SEMSWA and spreading that out amongst the remaining developable properties SEMSWA-wide. Using this method, developers would pay a set system development fee no matter where they developed, which results in a level playing field and a consistent way for developers to understand and calculate their drainage costs. SEMSWA could then use the fees in

any basin, focusing the money in areas where development pressures are greatest, while improving cash flows.