



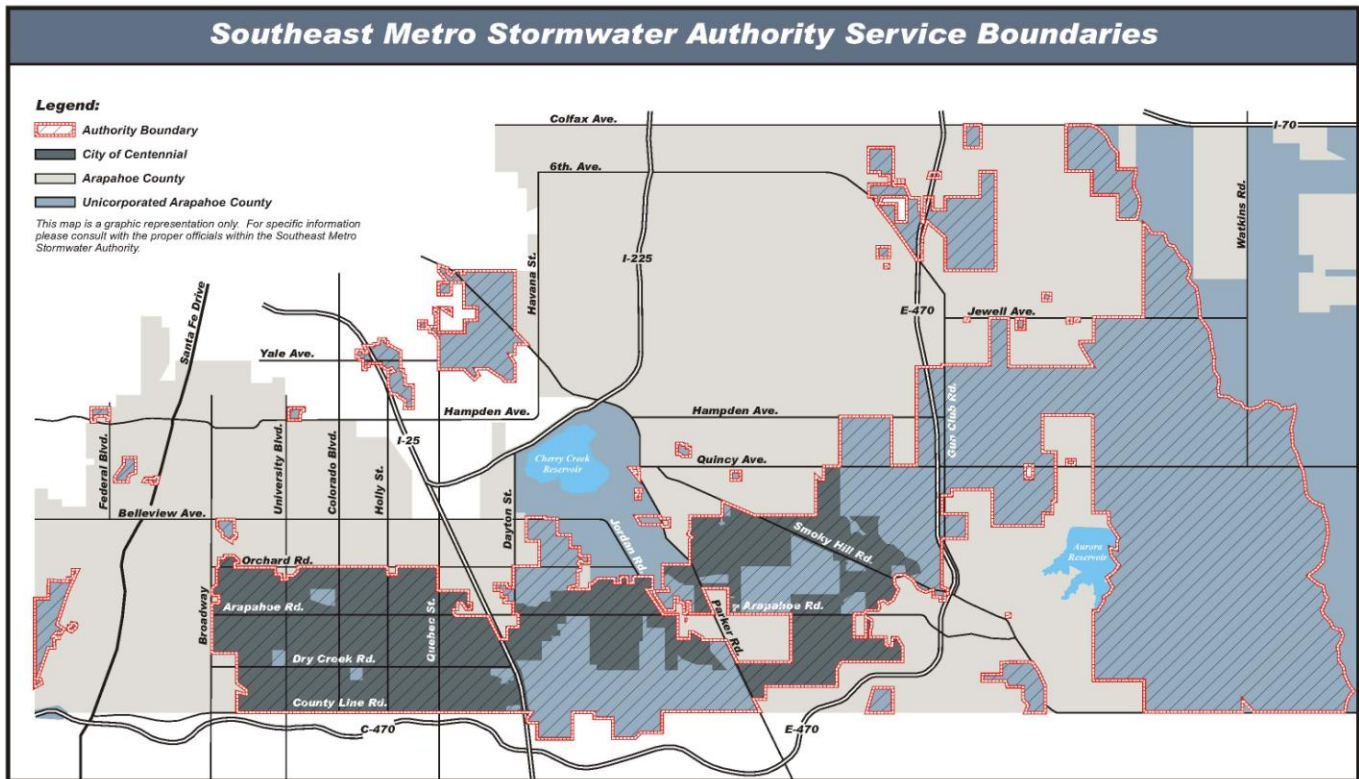
# 2009 Annual Report

Stormwater Management in the Southeast Metro Denver Area

The Southeast Metro Stormwater Authority (SEMSWA) is an independent governmental entity formed by an Intergovernmental Agreement among **City of Centennial, Arapahoe County, East Cherry Creek Valley Water & Sanitation District, Inverness Water & Sanitation District, and Arapahoe County Water & Wastewater Authority** to provide stormwater management for the southeast metro area. SEMSWA charges a stormwater management fee for individual and business property owners based on the amount of impervious surface (rooftops, driveways, and parking lots) on each property that contributes runoff to the system from a storm event. Funding from these stormwater fees addresses critical needs in planning, constructing, and maintaining stormwater infrastructure as well as protecting water quality and preserving floodplains. This report highlights 2009 activities conducted to meet these critical needs in the six SEMSWA stormwater management program areas as well as administrative and financial functions.



## Southeast Metro Stormwater Authority Service Boundaries





## Capital Improvement Program...

The Capital Improvement Program (CIP) constructs projects to ensure safe and efficient control of stormwater. CIP staff coordinate with the Water Quality Program to ensure standards are met, the Maintenance Program to maximize resources among construction projects, and the Floodplain and Development programs to ensure zoning and land use criteria are met. Typical CIP Program projects include:

- Repair/replace/retrofit aging and undersized conveyance systems
- Construction of new stormwater systems/facilities where master planned
- Stabilization of stream channels to handle increased urban stormwater runoff

Several CIP projects were completed in 2009, including:

- Little Dry Creek @ Arapahoe Road Conveyance, including a trail crossing, at a cost of \$2,116,000
- Dove Hill Estates Conveyance, east of Gun Club Road, at a cost of \$650,000
- Windmill Creek Stormwater Detention Pond W-4, at the corner of Potomac and Bronco's Parkway, at a cost of \$1,210,000
- Heritage Place Storm Sewer, east of Quebec Street and north of Arapahoe Road, at a cost of \$123,000
- Piney Creek @ Greenfield Filing #2 Tributary, with the assistance of the Maintenance Program, at a cost of \$50,000

CIP projects final designed in 2009, with construction anticipated in 2010, include:

- Piney Creek, Tower to Liverpool, including Caley Bridge, Stream Stabilization, and Outfall C Conveyance (\$2,260,000)
- Cottonwood Creek @ Easter Ave Stream Stabilization (\$1,500,000)
- Dove Creek Stormwater Detention Pond D-1 (\$700,000)
- Windmill Creek Water Quality Pond W-5 (\$280,000)
- Cherrywood Neighborhood Storm Sewer (\$1,400,000)
- Spring Creek (Willow Creek Tributary) Stream Stabilization (\$300,000)



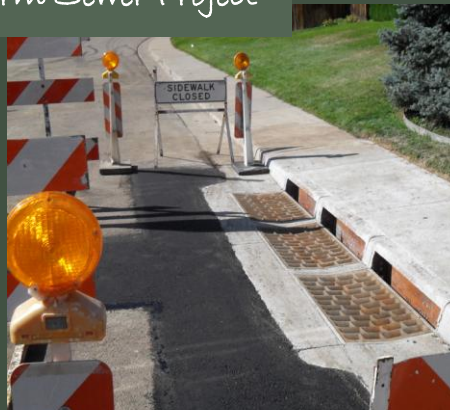
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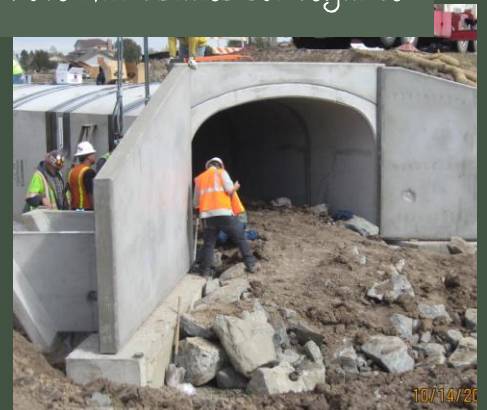
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Windmill Creek Pond W-4, Potomac @ Bronco's Parkway

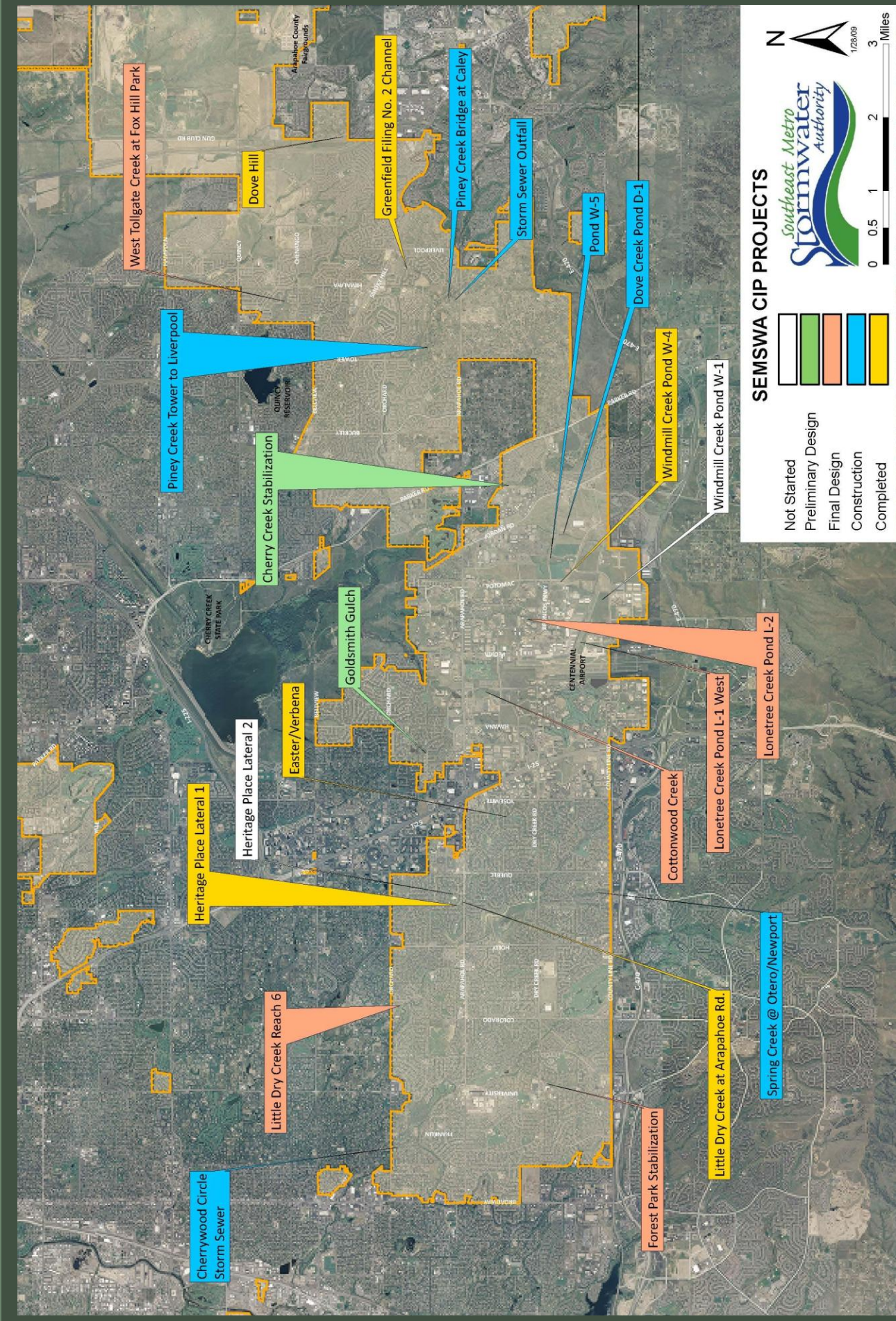
### Heritage Place Storm Sewer Project



### Dove Hill Estates Conveyance







# Status of Capital Improvement Program Projects





North side of Arapahoe Road



Arapahoe Road Flooding, July 2001



South side of Arapahoe Road



### Waterway Focus: Piney Creek

Piney Creek, a stream within the Cherry Creek basin, was the focus of several CIP design activities in 2009, as well as a volunteer planting effort to use vegetation growth to provide additional stabilization to banks experiencing erosion. Final design effort focused on three projects along Piney Creek, upstream of Tower Road:

- A bridge to replace the low water crossing @ Caley Avenue that is impassable during even minor storm events, causing havoc for residents
- Stream stabilization efforts for a stretch of Piney Creek from Tower to Liverpool that is experiencing channel and bank erosion
- Storm sewer construction for flows originating south of Arapahoe Road

All three of these projects were bid in late 2009 and will be constructed in 2010, at a cost of over \$2 million. The storm sewer project is a joint project with SEMSWA and Arapahoe County, and the stream stabilization and bridge projects are joint projects with SEMSWA and the Urban Drainage and Flood Control District. Additional stream stabilization efforts are planned for Piney Creek beyond 2010.



Neighborhood volunteer planting



# Floodplain Management Program...



Discount Flood Insurance

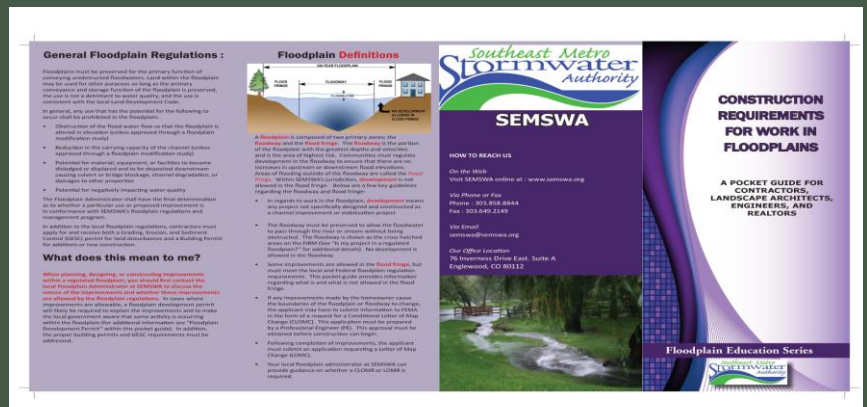
SEMSWA coordinated the new City of Centennial application and Arapahoe County's 5-year re-evaluation of the Community Rating System (CRS) in 2009, which rates communities that exceed FEMA's minimum regulations to ultimately discount floodplain insurance rates. The National Flood Insurance Program (NFIP) grants the citizens and businesses in SEMSWA's Service Area access to affordable flood insurance as long as SEMSWA manages the floodplain, and the CRS rating allows for a greater discount for floodplain stewardship. The City and County were both rated an '8', resulting in a 10% discount. An estimated 2600 parcels in the unincorporated portion of the County within the SEMSWA Service Area are in the floodplain; 14 have a floodplain insurance policies. An estimated 1100 parcels in the City are in the floodplain; 23 of those have floodplain insurance policies. SEMSWA outreach to these parcels will continue.

SEMSWA also participated in the initial review of the new draft digital Flood Insurance Rate Maps (DFIRMs) from FEMA for the City and unincorporated County in 2009. DFIRMs are a critical component of floodplain management, assisting the evaluation of the impact of development on the floodplain. Two successful public open houses were held, generating hundreds of inquiries that were followed up with phone calls and correspondence. No formal appeals were necessary during the appeals period that ended in September. The new effective date for the DFIRMs is September of 2010.

DFIRMS

## Floodplain Violations

Several violations were enforced for floodplain issues in 2009, including two violations along Greenwood Gulch in the City, both involving new walls built in the floodplain; one violation on Goldsmith Gulch in the County regarding replacing a fence, and one violation issued along Coal Creek in the County regarding storage of materials in the floodplain.



## Floodplain Outreach

SEMSWA also participated in the City's Land Development Code re-write, with inclusion of missing floodplain management information required by FEMA, and completed two brochures, one for Contractors and one for Homeowners.

## Master Planning Program...

Master planning includes the preparation of several types of documents in order to establish drainageway stabilization and floodplain parameters for successful development/redevelopment, including:

- Hydrology Report
- Phase A Alternative Plans Report (Phase A)
- Phase B Selected Plan of Improvements Report (Phase B)
- Outfall System Plan (OSP)
- Flood Hazard Area Delineation (FHAD) Report

During 2009, SEMSWA completed 10 of these various master planning documents for the following drainageways:

- Lone Tree, Windmill and Dove Creeks
- Willow and Little Dry Creeks and Greenwood Gulch
- First Creek
- Upper East Tollgate Creek
- Lower Cottonwood Creek

Two additional extensive master planning studies were initiated in 2009:

- Piney Creek OSP and FHAD
- Little's Creek (upstream of Broadway) OSP and FHAD

Also in 2009, SEMSWA worked with the Centennial Airport Board to finalize their master planning efforts in the airport area.



## Water Quality Program...



1



2



3



4



5



6

SEMSWA reduces the amount of pollutants in stormwater runoff entering streams, lakes, and rivers from residential, commercial, and industrial areas through implementing management programs established by the stormwater permit issued to SEMSWA by the Colorado Department of Public Health and Environment (CDPHE Stormwater Permit). When implemented together, these six program activities reduce pollutant discharges to the maximum extent possible, and include the following components:

- 1 Encourage the public to be willing partners and volunteers in efforts to minimize pollutants, including educational material distribution at public events, and training workshops (education & outreach)
- 2 Actively engage the public in efforts to minimize pollutants, including volunteer events, natural resource inventories, and encouraging collaboration among regional entities (public participation)
- 3 Trace, investigate, and eliminate illicit discharges, and promote recycling and proper discharge of household hazardous wastes
- 4 Reduce pollutants in stormwater runoff from construction activities (grading, erosion, and sediment controls (GESC))
- 5 Reduce pollutants in any stormwater runoff after construction activities are completed via Permanent Best Management Practices (post-construct pollutant controls)
- 6 Reduce pollutants in runoff associated with SEMSWA municipal operations (good housekeeping/pollution prevention)

As of 2009, the City of Centennial, East Cherry Creek Valley Water & Sanitation District, and Inverness Water & Sanitation District CDPHE stormwater permits have been transferred to SEMSWA. SEMSWA staff also implement unincorporated Arapahoe County permit programs through a Memorandum of Understanding, with Standard Operating Procedures.

### Curbside Household Hazardous Waste Collection and Recycling Program

SEMSWA has a contract with Curbside, Inc. for a Household Hazardous Waste (HHW) annual collection program. Curbside, Inc. offers a standard door-to-door HHW collection program for the proper disposal and recycling of leftover household hazardous materials for residents of unincorporated Arapahoe County and the City of Centennial. With a professional collection like Curbside, SEMSWA can work towards maximizing the recycling of HHW. Residents call a toll-free hotline (800-449-7587) operated by Curbside to schedule an annual collection. The operator will qualify the caller, determine the types and quantities of acceptable material the resident has for collection, and schedule a collection date and time. The co-payment for this program is \$20.00. SEMSWA picks up the remainder of the costs for the resident, about \$90 per household collection.



## Water Quality Program, continued...

### Public Outreach Program



SEMSWA's public education efforts to meet the CDPHE Stormwater Permit indicate that the stronger the connection between people and the drainageways, the more support there is to protect, preserve, and enhance the waterways and greenways. Towards that end, SEMSWA sponsored or participated in over 25 outreach activities in 2009, from building student and teacher awareness of water resources in their school's watershed, to developing community and volunteer support for on-the-ground watershed water quality projects. Activities range from staffing booths at resource fairs to conducting multi-day teacher training workshops. Some examples of 2009 outreach activities include:

- Summer solstice ecoventure at the Cherry Creek Valley Ecological Park to expand community awareness of this park resource
- Maintenance support by the Americorps and Summer of Service volunteers to build the volunteer base and support agency efforts
- Teachers workshop to support the teacher and student awareness of the natural resource components of curriculum
- Booth at Arapahoe Community College's Earth Day Celebration



## Medicine Take-back Program

The State-wide pilot program for *residential out-of-date or unused pharmaceutical collection*, known as the "**Medicine Take Back Program**" was launched December 1<sup>st</sup> at several retail pharmacy sites. SEMSWA participated as part of the Program 3- Illicit Discharge Detection and Elimination efforts on behalf of SEMSWA's CDPHE Stormwater Permit. There are 10 collection boxes in place for the program. One is in Boulder, seven are in the metro area and two are in Summit County. Residents may bring non-controlled pharmaceuticals in their prescription containers to these drop-box locations. The pilot program will last up to two years, depending on participation. For more information, please contact SEMSWA at 303-858-8844.



## Annual GESC Permit Program

The **Annual GESC Permit Program** recognizes those agencies/entities that share SEMSWA's water quality and environmental stewardship goals with an *abbreviated permitting process* for standard, repetitive and consistent construction activities that require grading, erosion and sediment controls. This abbreviated process increases efficiency for SEMSWA and the project owner. The 2009 Annual GESC Permit holders include the SEMSWA Maintenance Program (routine projects), Urban Drainage and Flood Control District (maintenance projects), and Xcel Energy (cable replacement). Other utility companies/activities will be included at a later date as the annual programs are evaluated for effectiveness.





# Maintenance Program...

The SEMSWA Maintenance Program is responsible for maintaining culverts, pipes and other stormwater infrastructure to effectively convey stormwater to a major drainageway. Some of the day-to-day activities include:

- Conducting an inventory of existing infrastructure, including size, type, and condition
- Responding to citizen concerns and inquiries about the storm sewer system
- Inspecting the storm sewer system
- Cleaning culverts, grates, inlets, pipes, and ponds
- Repairing outfalls, culverts, and rundowns
- Constructing minor infrastructure projects, including storm sewer pipe replacement, upsizing inlets, and modifying outfalls
- Constructing special remedial projects with in-house design, including collector system channel restoration and bank stabilization

The following infrastructure were cleaned and flushed in 2009: over 1800 storm grates, an estimated 4,770 feet of storm sewer pipe, and over 450 vaults. In addition, almost 82,000 feet of storm sewer lines were inspected, an estimated 3,800 lineal feet of channel/ditches were reconstructed, and 16 major intersection storm sewer pipes were repaired. Also, 61 regional or sub-regional detention ponds were maintained by SEMSWA maintenance.



Erosion control blanket installation



Drop structure grout preparation



Street inlet repair



Installing temporary check dams



Storm sewer pipe replacement



Setting boulders @ Greenfield



Additionally, several infrastructure projects were constructed by, or with assistance from, the Maintenance Program in 2009, including:

- Greenfield Tributary to Piney Creek Channel Conveyance Improvements
- Inlet upgrade at Easter Avenue and Verbena
- Willow Creek Embankment Stabilization
- Arapahoe Road and Euclid Avenue Inlet Rehabilitation
- Homestead Parkway and Costilla Avenue Outfall Repair
- Antelope Creek Tributary to Piney Creek Low Water Crossing
- Piney Creek Hollow Park Channel Conveyance Improvements



Micropool sediment removal



Infrastructure GPS inventory



# Maintenance Program projects...BEFORE & AFTER

Fairfax Outfall to Little Dry Creek Sediment Removal



Greenfield Trib Conveyance Channel Improvements



Smoky Hill Detention Pond & Trickle Channel Sediment Removal



Water Quality Pond on Unnamed Creek Sediment Removal

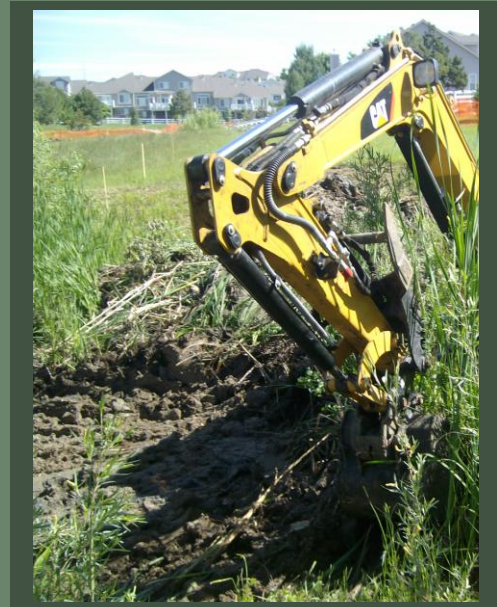




## Maintenance Program, continued...

*What kinds of materials are recycled during Maintenance Program activities?*

The Maintenance Crews had several opportunities to recycle the tons of sediment and vegetation debris that were removed from stormwater infrastructure facilities during maintenance activities in 2009. Sediment removal projects and channel cleaning activities all provided ample raw materials that can be re-used, including brush, branches and sucker trees, and sediment-loaded organic 'muck'. Wood chipper equipment made quick work of vegetation clearing and grubbing, while dried removed sediment provided an excellent addition for topsoil. All totaled, SEMSWA provided 347 tons of the mulch material, and 630 tons of 'muck' to local companies for re-use as landscaping materials.



## Land Development Coordination Program...

The Land Development staff continued the coordination of land development opportunities within Arapahoe County and the City of Centennial to meet the objectives of comprehensive, efficient, and effective stormwater management. These objectives ensure that the community has well-planned, adequate, and long-term stormwater infrastructure.

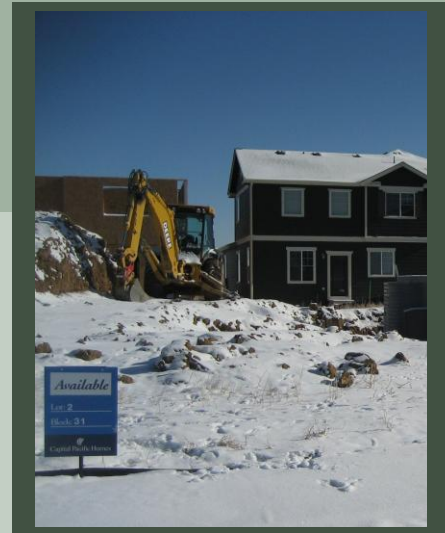
The County and the City refer private land development cases and capital construction projects to SEMSWA for review. SEMSWA staff reviews these referrals as well as SEMSWA capital projects for compliance with established criteria and approves them for construction. In 2009, SEMSWA received a combined total of 78 referrals from the City and County; as compared to 115 referrals in 2008. A summary of the land development referrals and the capital construction projects that were reviewed in 2009 is highlighted in the following table.

| Project Type         | City      | County    | SEMSWA    | Total     |
|----------------------|-----------|-----------|-----------|-----------|
| Private Development  | 43        | 35        | 0         | 78        |
| Capital Construction | 0         | 1         | 10        | 11        |
| <b>TOTAL</b>         | <b>43</b> | <b>36</b> | <b>10</b> | <b>89</b> |

In June, SEMSWA adopted and began collecting System Development Fee's (SDFs). These fees are one time charges paid by new developments to fund the development's fair share of the public stormwater infrastructure needed to serve it. SDF's, which are assessed on the basis of the amount of impervious surface constructed, varies between watersheds depending on the cost of the capital projects needed in a particular watershed.

In addition to the implementation of SDF's, a Credit Policy was also adopted in June. The Credit Policy establishes a process by which rate payers can obtain a fee reduction for making improvements to their property which reduces the impact of the property's runoff on SEMSWA's stormwater system.

SEMSWA also completed a "cost of service analysis" in late 2009 and developed recommendations for new review and permit fees. It is anticipated that these new fees, which will replace some of the existing fees currently being collected by the City and County, will be adopted in early 2010.



Fees and Cost of Service



## GIS Program...

During 2009, SEMSWA continued the annual drainage inventory system data collection, documentation and verification efforts. The Geographical Information System (GIS) database efforts in 2009 included:

- **Stormwater System Inventory:** SEMSWA staff and interns made considerable progress mapping and field verifying SEMSWA's stormwater infrastructure. To date, nearly 80% of all infrastructure (inlets, pipes, manholes, etc) has been field verified. This information proves useful in many ways, including asset management, planning, and establishing a *proactive* maintenance program.
- **Asset Management System:** Software and database development efforts continued with SEMSWA's Asset Management Software (Cartegraph). In particular, work request/order management and stormwater modules have been developed and are currently being put into use. These software screens will help SEMSWA better serve customers by logging assets, condition ratings, work requests, associated work orders, tracking illicit discharges, and integrating information with map based points.
- GIS staff continued the use of Light Detection and Ranging (LiDAR) elevation data with floodplain management, CIP, and drainage related mapping efforts. Additionally, SEMSWA acquired satellite imagery to support its 2009 impervious surface mapping project.

In addition, 2009 GIS Program efforts included a successful internship program, channel layer digitizing, computer aided drafting (CAD) integration, participation in the Denver Regional Data Consortia, and implementation of a mobile software /system support for Stormwater Inspectors.



### GIS Inventory to date....

- 915 culverts
- 6,555 inlets
- 3,905 manholes
- 219 miles of pipe
- 1,923 outfalls
- 393 ponds/basins
- 155 miles of channel
- 183 grade control structures

## Customer Service...

The goal of SEMSWA's Customer Service Program is to provide a rapid response to queries regarding stormwater management fees and services. During 2009, **1,118** customer service inquiries (CSIs) were received and responded to:

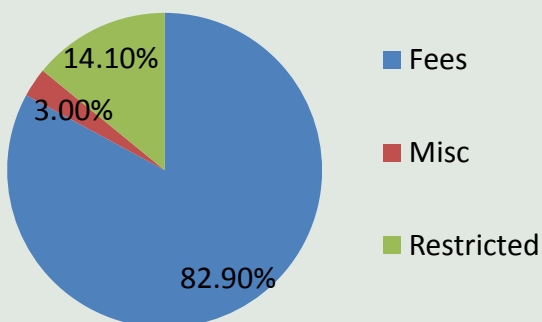
- 61 stormwater system maintenance requests
- 896 assessed fee & delinquent fee inquiries
- 161 general information requests

SEMSWA's customer service representative can be reached at **303-858-8844**.

## SEMSWA Financials...

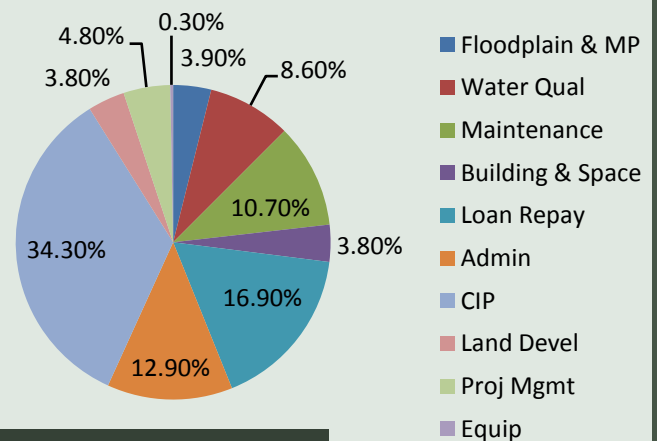
SEMSWA is a political subdivision and a public corporation of the State, falling under the guidelines of Colorado State Statute for a "drainage authority" (29-1-204.2 C.R.S.). This statute allows fee collection for stormwater management services. There are two standard methods of charging for stormwater services in use by SEMSWA and others in metro Denver and Colorado as well as across the country: 1) stormwater utility fees, calculated as an annual charge to residential and non-residential property owners based on impervious area per property; and 2) new development fees, referred to as a 'System Development Fee', calculated per acre and paid by developers. SEMSWA sets fees at levels to insure there are funds available to properly manage stormwater and to meet EPA and State regulatory requirements. The 2009 financials are illustrated.

### SEMSWA Revenue 2009



Revenues: \$9,998,747

### SEMSWA Expenditures 2009



Expenditures: \$9,298,466



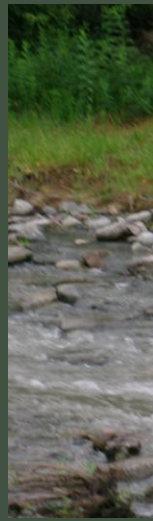
# 2009 Annual Report 'At-A-Glance'

## Highlights of SEMSWA Six Program Areas...

The goal of SEMSWA's Water Quality Program is to reduce the pollutants in stormwater runoff entering streams, lakes and rivers from residential, commercial, and industrial areas. The following are highlights of the 2009 water quality program activities:

### Water Quality

- More than 25 outreach events, including booths at public events & conferences, judging at science fairs, inlet labeling, volunteer cleanup and planting events, Eagle Scout projects, and teacher training
- Over 2,000 inspections at over 150 active construction sites in the SEMSWA Service Area
- Enforcement actions at construction sites, including 34 follow-up Re-inspection Fees
- 97 potential improper discharges investigated
- 520 residential curb-side household hazardous waste collections and 42,000 pounds of waste collected for recycling or disposal.



### Maintenance

The Maintenance Program is responsible for maintaining culverts, pipes and other stormwater infrastructure to effectively convey stormwater to major drainageways. Maintenance activities at stormwater infrastructure facilities in 2009 resulted in 630 tons of trash and debris collected, and over 6,000 tons of sediment removed and taken to the landfill.

Additionally the maintenance crews constructed numerous stormwater conveyance improvements in response to customer service inquiries, including constructing rundowns, upsizing inlets, pipe repair, and re-grading tributary channels within SEMSWA neighborhoods.

### Development

The Land Development Program staff continued to coordinate land development to meet objectives of comprehensive, efficient, and effective stormwater management. Development referrals received in 2009 included 35 County referrals and 43 City referrals. Also during 2009, SEMSWA staff reviewed one County capital project, and 10 SEMSWA capital and/or maintenance projects.



### CIP Program

SEMSWA's Capital Improvement Program (CIP) constructed four major drainageway projects, and completed final design on seven capital projects for construction in 2010. A major 2009 project was the \$2 million Little Dry Creek @ Arapahoe Road Conveyance Improvement project that will alleviate flooding on Arapahoe Road west of the Quebec intersection. This project also included the construction of a trail underpass, for future linkage to the Little Dry Creek trail further downstream. The CIP group also initiated preliminary design in 2009 on another three capital projects, including several Piney Creek improvement projects in the eastern part of Centennial.



### Floodplain Management

The SEMSWA Floodplain Management Program utilizes corrective and preventative measures to reduce flood event damage to public and private properties. A major effort this year was to obtain discounts on flood insurance premiums for both Centennial and Arapahoe County through FEMA's Community Rating System.

2009 Floodplain Program statistics:

- 163 floodplain inquiries from the public/Building staff
- 34 Floodplain Permits reviewed/approved
- 14 floodplain modeling studies reviewed
- 9 Map Revisions reviewed

### Master Planning

The following master plan documents we completed in 2009 to plan for adequate storm drainage infrastructure, regional water quality and flood control:

- First Creek Hydrology and Alternatives Reports
- Lone Tree, Windmill, and Dove Creeks Hydrology and Alternatives Reports and a Flood Hazard Area Delineation (FHAD) study
- Willow Creek, Little Dry Creek, Greenwood Gulch Hydrology and Alternative Reports
- Upper East Tollgate Creek FHAD, Hydrology and Alternatives Report
- Lower Cottonwood Creek Hydrology and Alternatives Reports