



2013 Annual Report



A Message from the Executive Director



Welcome to our annual reporting of 2013 activities. When we sum up what we have accomplished for the year, we try to emphasize those items of most interest to our ratepayers. High on the list of interest at the neighborhood level is the

maintenance the Southeast Metro Stormwater Authority (SEMSWA) performs to make sure your stormwater infrastructure is sound and working effectively. Our ongoing inventory of pipes, culverts, outfalls, and channel conditions, to name a few common stormwater facilities we manage, allows us to assess priorities and get ahead of any failures. Responding to concerns of the community allows us to focus on our major assets and make sure they function as designed.

Our commercial ratepayers have a specific interest in functioning stormwater infrastructure that allows their customers to make it to their business during one of those mid-summer thunderstorms. Although storm flow along the curb and gutter of a street is acceptable, a business is happiest when the storm system is able to get it out of everyone's way as fast as possible. The developers in our service area want the most out of their land parcels, and are very interested in utilizing every available square foot for their purposes, not stormwater, and look to us for planned regional solutions to their water quality and flood control requirements.

Our future ratepayers probably don't think about SEMSWA and stormwater management at this very moment, but we anticipate that they want their new property or new parking lot to perform well, regardless of the intensity of a rain event. We hope they enjoy a high quality of life in the SEMSWA service area and will look to us to assist them in minimizing their impact on water quality so that our creeks remain inviting greenways.

All of these interests were highlighted with the record-breaking September floods that strained the capacity of our stormwater infrastructure. We were fortunate that strong floodplain zoning regulations, proactive maintenance of the storm sewer system, and construction of regional flood control and channel stabilization projects helped minimize the damage in our service area. We have the SEMSWA ratepayers to thank for this. I want to personally express my appreciation for your support of our efforts to manage stormwater efficiently and effectively.

John A. McCarty, PE, PWLF

The SEMSWA Mission

Provide stormwater management services essential to the protection, preservation, and enhancement of our neighborhoods, community, and natural resources through flood control, water quality, construction, maintenance, and education.



*Cherry Creek Valley Eco Park
flooding – September 2013*



Capital Improvement Program



This grouted boulder bank protection provides stability during high flow events in Little Dry Creek for the Southgate Water & Sanitation District offices in Centennial

2013 was a very active year for the Capital Improvement Program (CIP) group, with completed projects ranging from a culvert upsizing project out in eastern Arapahoe County, to several channel stabilization projects in the urban stream corridors, with a regional pond retrofit along Arapahoe Road in Centennial included in the completed project list. In order to maintain shovel-ready projects, the CIP group initiates concept design and scoping discussions for numerous new projects each year that can be readily added to the queue of projects that solve local flooding problems or stream channel instability. This steady progress in constructing prioritized CIP projects improves the ability to withstand the impacts of larger storm events and minimizes the more costly emergency fixes.

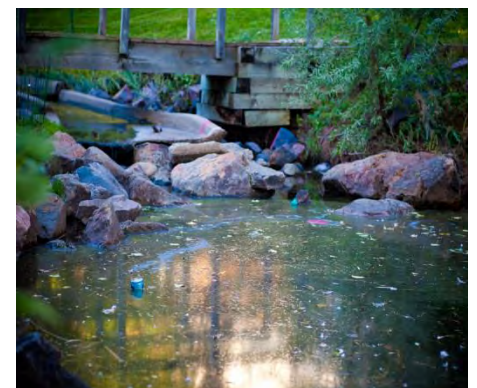


Inventory Efforts in 2013

In late 2013, SEMSWA CIP initiated a comprehensive field inventory of major drainageways and associated conveyance facilities. This effort includes physical observation of drainageway channels and associated infrastructure for the purposes of assessing condition and updating GIS mapped locations. CIP is utilizing this information in SEMSWA's asset management system to identify potential future CIP projects, and also areas of concern needing a more immediate response than inclusion on the 5- or 10-year CIP list. This inventory will be completed in early 2014.

CIP Projects Completed in 2013

- ✓ Lincoln Executive Center Pond Retrofit
- ✓ Little Dry Creek - Reach 6 at Southgate Water and Sanitation District Offices Channel Stabilization
- ✓ First Creek at Jewel Avenue Culvert Replacement
- ✓ Cherry Creek at Cherry Creek Valley Ecological Park Channel Restoration
- ✓ Piney Creek Downstream of Caley Bridge Channel Stabilization
- ✓ Willow Creek at Quebec Street Channel Stabilization



Two projects started in late 2013 include a Piney Creek grade structure rehabilitation project at Parker Road, and improving the water quality entering Arapahoe Lake

Floodplain Management and Master Planning

The September flooding affected 24 counties in Colorado, some experiencing 7-day rainfall totals exceeding the 1,000 year storm event, and made all of us aware of nature's power. Many people think that if they do not live near a stream or creek, then they are not in danger of flooding; this is not true. Flooding is the nation's number one natural disaster. And flood maps don't show all areas at risk; flooding can and often does occur outside the 'mapped' floodplain. Flooding often occurs along smaller streams and creeks that are not shown on any flood map. Non-creek flooding can occur from overwhelmed storm sewers, low-lying areas that do not have proper drainage, or water mains that break. Much of the true risk of flooding is its unpredictability.

Colorado's flood season, which is historically from May through October, includes both snowmelt and thunderstorm flooding. Snowmelt floods result from the melting of the winter snowpack in the high mountain areas which becomes spring runoff. Thunderstorm floods, like the September floods, are caused by intense rain over usually relatively small areas. Between 20 and 30 large floods occur somewhere in Colorado every year and Colorado experiences a major flood disaster roughly once every five years.

Your homeowners insurance policy does not cover flood damage. Homeowners, business owners, and renters can purchase insurance protection through their agent for both buildings and contents. To learn more about preparing for a flood, visit www.semswa.org or (303) 858-8844.

Floodplain Program Statistics

During 2013, 53 floodplain permits were reviewed, approved, and issued for work in a floodplain, 15 floodplain studies were assessed for impacts from proposed work, and nine requests for modification to a floodplain were approved. Because determining floodplain limits is more than the average property owner is equipped to handle, SEMSWA responded to 23 inquiries requesting assistance in defining floodplain limits on their parcel and what that means to them as a property owner. Also during 2013, four floodplain violations were investigated. Outreach efforts were significant in 2013, and included 52,000 mailings with important flood risk information.

Master Plans Completed

During 2013, the following master plans and studies were completed in Centennial and Arapahoe County:

- Sand Creek Flood Hazard Area Delineation (FHAD) and Major Drainageway Plan (MDP)
- West Toll Gate Creek and Unnamed Creek FHAD and MDP
- Cherry Creek (Reservoir Dam to South Platte River) FHAD
- Coal Creek & Senac Creek FHADs

Efforts in progress during 2013 for basin master planning include Box Elder Creek, Iliff Avenue Corridor Study, Big Dry Creek, and Happy Canyon Creek plans.



Stream conditions identified during master planning studies



Master plans are prepared to provide regional drainage and stormwater quality improvements, and to mitigate flood hazards. These master plans are used to guide development and identify future capital construction improvements.



One of the regional pond facilities along Cottonwood Creek, a basin that has been master planned with larger, more effective ponds for flood control detention

Maintenance Program

During 2013, maintenance efforts continued to consist of routine sediment removal from channels and ponds; inlet, vault, and culvert cleaning; and pipe inspection, using both visual methods and a camera. Additionally, the crews maintained drainage infrastructure in the road right-of-way (ROW), repairing roadside drainage swales to keep overflows out of traffic lanes, raising manholes to mitigate safety concerns, and repairing or replacing buried corrugated metal pipe (CMP) conveying flows under roadways.

In response to the record-breaking September rain events, SEMSWA crews were hard at work during the last quarter conducting emergency repairs. Centennial's Cherrybrook subdivision pond was not able to handle the volume of storm flows and breached at the north embankment, depositing a massive amount of sediment on the Piney Creek Trail. The crews cleared the trail and repaired eroded banks further downstream at a Piney Creek low-water crossing. A 2014 CIP project will repair the pond embankment and complete Piney Creek channel improvements. Arapahoe County's Inverness Golf Course also experienced flooding issues, specifically at Golf Hole #5, where the water feature threatened to overtop Inverness Drive East. The crews released the pond water in preparation for a 2014 CIP project to replace a clogged and failing CMP under the road in order to increase conveyance capacity during larger storm events.



Cherrybrook pond's north embankment breach



Emergency repair of Piney Creek eroded banks



Golf Hole #5 pond ready to overtop Inverness Drive E.



Maintenance crew releasing storm flows from pond



Drained pond @ Inverness Golf Course Hole #5



Cleaning sediment at the Kenyon Street outfall

The Maintenance Program is responsible for inspecting, cleaning, repairing, and replacing stormwater infrastructure so that storm flows are effectively conveyed from pipes, culverts, and ponds to the drainageway. The 2013 work order total numbers illustrate the extent of the infrastructure maintained:

- **5,000** inlet grates & vaults cleaned
- **3,245** feet storm pipe cleaned
- **3,000** tons sediment removed
- **430** tons overgrowth removed
- **792** acres mowing/weed control
- **245** pond maintenance activities
- **31,800** feet storm pipe inspected
- **320** service requests processed

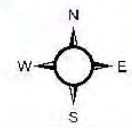


Cleaning inlets with the SEMSWA Vector® truck





SEMSWA CIP and Maintenance Project Map 2013



Legend

- Completed in 2013
- Under Construction in 2013
- 2013 Maintenance Work Orders
- Pipes Inspected by Video
- SEMSWA Service Area

1. Country Park Pond Conversion (Detention to EDB)
2. Little Dry Creek Reach 6 Channel Improvements
3. Arapahoe Rd @ Fairfax Storm Sewer Rehab (CIPP)
4. Willow Creek Stabilization (Quebec to Dry Creek)

5. Iliff and Syracuse Stormsewer Improvements
6. Walnut Hills Outfall Improvements
7. Goldsmith Gulch Channel Improvements
8. Lincoln Executive Center Pond Modification

9. Piney Creek @ Parker Rd Channel and Pond Improvements
10. Cherry Creek Reclamation @ Eco Park
11. Piney Creek @ Caley Channel Stabilization (Phase II)
12. East Toll Gate Creek Regional Pond Improvements

Water Quality Program

The State's Stormwater Discharge Permit was up for renewal in 2013, and SEMSWA participated in the Public Notice comment period, along with 60+ other entities operating under the State General Permit for Municipal Separate Storm Sewer Systems (MS4). The permit renewal process will continue into 2014, with a second Public Notice and another chance to review and comment on a revised permit in late Spring. In 2013, SEMSWA met permit requirements to reduce pollutants in stormwater runoff from residential, commercial and industrial areas through outreach at 10 community events, permitting and inspecting sediment controls at over 270 construction sites, ensuring the proper construction of 16 water quality treatment facilities for new development, resolving over 40 illicit discharge reports, and recycling 42,000 of the 51,000 pounds of household hazardous waste collected from over 575 County and City households.



Outreach efforts at Western Welcome Week Booth

Water Quality Pond Retrofits

In 2013, the SouthCreek subdivision's water quality ponds were retrofitted to improve functionality, reduce upkeep, and enhance water quality through the use of SEMSWA's Grant Program for Retrofitting of Stormwater Facilities. These three low-functioning ponds had high maintenance costs, and rather than have the HOAs continue to pay for maintaining ponds that were adding little benefit to water quality goals for the Cherry Creek basin, SEMSWA partnered with the HOAs to complete the retrofits. Giving property owners an incentive to upgrade their existing pond is a win-win scenario, helping to enhance water quality, community aesthetics, and functionality in the short term; potentially lessening flooding and channel erosion in the long term; and hopefully saving money over time.

The Ridge LID Campus

In 2013, SEMSWA constructed a Low Impact Development (LID) Demonstration Campus with the intent to provide pilot green stormwater treatment options for new development sites. The LID water quality facilities constructed include a bioswale, two types of tree filter boxes, "living wall", filtering inlets with planter boxes, two rain gardens with varying designs, and a proprietary hydrodynamic separator unit to assess its use at constrained sites. SEMSWA will be able to use the design and construction "lessons learned" to provide training for design engineers and contractors on the appropriate selection and installation of these LID facilities.



Southcreek Pond A showing an anoxic boggy bottom and sparse vegetation in March 2013, as compared to the newly constructed retrofitted pond in September

Land Development Coordination Program

Land Development Program staff were busy in 2013 responding to a significant increase in new project applications. A sure sign of an improving economy, staff received the largest number of submittals since 2008. Project submittals typically include development plans, drainage reports, construction documents, and various permit applications. Staff was prepared to receive and process this increased workload because of efficiencies gained through emphasis on early assistance meetings with applicants, close collaboration with partner agencies, and award-winning electronic review of documents.

One of the more interesting development projects in 2013 was SEMSWA's own building, scheduled to be completed in late summer 2014. The plans went through the same review and approval process as all other development applications in SEMSWA. The new building site provided a unique perspective for staff, as being on the developer side of the process offered the opportunity for an enhanced appreciation of the communication, coordination, and scheduling needed for the plan submittal and referral process.

Land Development staff also analyzed and updated the Review and Permit Fee Schedule in 2013, resulting in simplification of the fee structure and no significant fee increases. Looking to 2014, the Land Development Program will assist with the SEMSWA website update, specifically to provide additional on-line resources and useful information for our development customers.



The SEMSWA building under construction adjacent to Regional Pond D-2.

GIS/IT Solutions Program

During 2013, the Geographic Information System (GIS)/Information Technology (IT) Solutions group continued to lead the effort to integrate GIS data associated with mobile inspections; infrastructure inventory and as-built information; and retrieval of regulatory data. They also began a process to evaluate upgrading the existing data management and records software to an automated software system for permitting, work order, and stormwater asset management.

In September, SEMSWA's GIS/IT and Inspection personnel helped staff Arapahoe County Sheriff's Office's (ACSO) Emergency Operations Center in response to the record-setting rain events. GIS/IT staff contributed their expertise in locating critical stormwater infrastructure in relation to the flooding potential of at-capacity streams, ponds, and culverts. GIS/IT staff, and inspectors reporting on conditions in the field, provided real-time updates and mapping of pond locations threatening to overtop and inlet locations along Parker Road clogged by hail. This significantly assisted emergency response personnel in managing potentially hazardous situations.

In addition, the GIS/IT group collaborated with the CIP group to establish a stream channel inventory project to collect data on bank and channel conditions, outfall locations and status, and infrastructure in need of maintenance, repair or replacement. All of this stream channel data will be mapped with GPS as part of the asset inventory management program. While the channel inventory will not be completed until spring 2014, numerous maintenance work orders have been generated and CIP projects scoped for inclusion on the 5- and 10-year CIP lists. This channel data further complements the ongoing inventory of hard stormwater assets like pipe and structures, with the goal of a comprehensive asset management database.



SEMSWA personnel helped staff ACSO's Emergency Operations Center during the September flooding to provide inspection and mapping assistance for at-risk facilities

September Floods



Piney Creek west of Caley Avenue Bridge



Cottonwood Creek north of Easter Avenue



Windmill Creek north of Arapahoe Road

Following the record-breaking flooding in September of 2013, SEMSWA staff conducted an inventory of all affected stormwater management facilities, including drainageways, to determine what repairs would be necessary in the weeks and months that followed. While the flows in Centennial were not of the same magnitude as those experienced in the northern part of the State and in neighboring Aurora and Parker, the antecedent rains from early in the week saturated the ground and caused the later rains to immediately runoff and contribute to downstream impairment. This type of storm, regardless of intensity, often results in damage to downstream facilities. SEMSWA's inventory revealed the expected incidents of bank and conveyance channel erosion where overtopping had occurred, and revealed locations where pipe capacities were undersized; but overall, damages were very limited due to SEMSWA's proactive approach to stormwater management.



Little Dry Creek @ Arapahoe Road required the pedestrian trail culvert (designed to convey the larger storm event overflows) in addition to the main stream culvert to carry flows during the September storm events

Regional Ponds for Flood Control

Fortunately, the eastern part of Centennial that experienced the most intense and sustained rain of the week-long storm event, specifically the Cherry Creek watershed, has regional detention and water quality ponds. These ponds are built to hold back collected runoff and slowly release it at a specified rate for a large storm event. Regional ponds protect against flooding by not contributing additional flows to the already swollen creeks during peak flow times. The response to the 1965 flood that ravaged Cherry Creek was to build Cherry Creek Dam and form the Urban Drainage and Flood Control District (UDFCD). With funding assistance from UDFCD, SEMSWA has constructed a system of regional flood controls and has stabilized many of the creeks in the Cherry Creek watershed, and as a result, significant damage was avoided during the September floods.



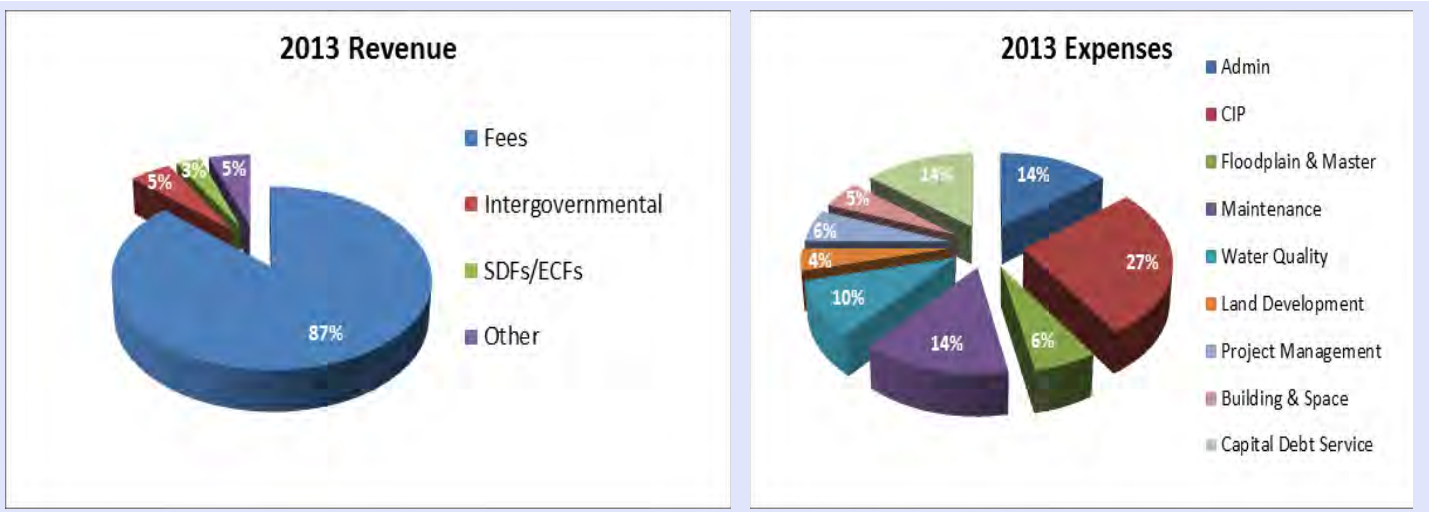
Regional Ponds in the Cottonwood Creek, Dove Creek, and Windmill Creek basins detain storm flows and release at a slow rate to keep the runoff peaks from damaging structures

SEMSWA Financials

SEMSWA is a political subdivision and a public corporation of the State, falling under the guidelines of the Colorado Revised Statutes (C.R.S.) for a "drainage authority" (29-1-204.2 C.R.S.). SEMSWA's purpose is to plan, fund, construct, acquire, operate, and maintain drainage and flood control facilities within the SEMSWA service area.

SEMSWA is a business-type activity that is financed by fees and charges. Fees are based on the amount each property contributes to stormwater runoff. This was determined by the SEMSWA Board to be an equitable assignment of cost, as property owners pay fees in proportion to the demand their property's runoff places on the storm system. Fees paid by owners of existing properties are not used to pay for new development infrastructure, again ensuring an equitable assessment of fees for stormwater services. The SEMSWA Board has set fees to provide sufficient funds to properly manage stormwater and meet State and Federal regulatory requirements. Property owners can dispute their calculated amount of impervious area and density, through an appeals process. More detailed information is available at www.semswa.org.

2013 saw the culmination of several years of financial planning for SEMSWA's future building and space requirements, with the beginning of construction on a SEMSWA building and maintenance facility. Key elements of the planning included: setting aside \$1 million over a period of four years to go toward the design and incidental costs of the new facility, identification of SEMSWA owned property for the building site, and securing long-term tax-exempt financing for construction. As a result of the project, SEMSWA's facility needs will be met on a long-term cost-effective basis.



SEMSWA Staff 2013





Pictures provided by Vintage Spark Photography of the Cherry Creek Valley Ecological Park stream reclamation project completed in 2013

The Southeast Metro Stormwater Authority is a legal entity formed through an intergovernmental agreement between Arapahoe County, the City of Centennial, Arapahoe County Water and Wastewater Authority, East Cherry Creek Valley Water and Sanitation District, and the Inverness Water and Sanitation District. The boundaries of SEMSWA cover the City of Centennial and the developed areas of the unincorporated portions of the County. The Stormwater Authority, which is also an Enterprise, provides the resources and funding to protect people and property from flooding while also complying with water quality regulations.

SEMSWA 2013 Board Members, Representation, and Contact Information

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- Nancy Sharpe, Arapahoe County, nsharpe@arapahoegov.com
- Linda Lehrer, Special Districts, Lehrer@a.com
- Bart Miller, Chair, City of Centennial, bart.miller@state.co.us
- Andrea Suhaka, City of Centennial, standy@ecentral.com
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