Charlotte
Pilot SCM Program
Why Study SCMs?

• Lots of unknowns in stormwater management

• Will SCMs really work – not much data available

• What types of SCMs should we use

• How much will they cost

• How hard are they to maintain
Program Purpose

• Install/Construct a wide variety of SCMs

• Monitor SCM stormwater inflow and outflow

• Determine Pollutant Removal Efficiency, Maintenance Requirements, and Cost/Benefit

• Utilize Data to develop Local SCM Standards

• Utilize Data for overall Water Quality Management Program
Where we put SCMs

• City Municipal Sites – Street maintenance yards, bus lots, garbage truck lots, fire stations, capital projects, etc.

• Public Properties – Parks, greenways

• Schools

• Commercial and Industrial Sites

• Private Development Sites
**What we get from SCM projects**

- Stormwater treatment – improved water quality and flow abatement
- SCM data – chemical, flow, O&M
- Educational opportunities
- Aesthetic benefits – wet ponds, wetlands, and rain gardens
- Habitat, open space, amenities
What’s the cost of SCM projects?

• A lot, more than you think $$

• Most projects are retrofits, which are more involved

• Projects can range from $50k to over $1 million
What about Maintenance?

- Can get expensive, site and SCM dependent
- Short term vs. Long term Maintenance
- Not a lot of data yet on costs
- Vegetation Management ~ $2500 per event
- Tank cleaning, pump & haul ~ $2000 per event
Study SCMs

Completed

**Phase 1:** (12 sites; monitored 2004 - 2006)

- Wet ponds (2 sites)
- Wetlands (2 sites)
- Bioretention (1 site)
- Level Spreader (1 site)
- Hydrodynamic Separators (4 sites)
- Dry Detention (2 sites)
Study SCMs
Completed

**Phase 2:** (17 sites; monitored 2006 - 2012)

- Wet ponds (1 site, 1 site R)
- Wetlands (2 sites)
- Bioretention (2 sites)
- Hydrodynamic Separators (8 sites)
- Pervious Concrete (1 site)
- Dry Detention Sand Filter (1 site)
- Proprietary Filter (1 site)
Study SCMs

In Progress

**Phase 3:** (17 sites; monitored 2013 - 2016)

- Wet ponds (1 site)
- Wetlands (1 site, 1 site R)
- Bioretention (3 sites, 1 site R)
- Level Spreader (1 site R)
- Proprietary Filters (4 sites)
- Pervious Concrete (1 site R)
- Dry Detention Sand Filter (1 site)
- Detention w/Infiltration WQv (3 sites)
Study SCMs

Future

Phase 4: (10 sites; monitor 2016 - 2020)

- Wet ponds (3 sites)
- Wetlands (1 site)
- Proprietary Filters (3 sites)
- Dry Detention Sand Filter (1 site)
- Detention w/Infiltration WQv (2 sites)
SCM Monitoring

- Sample inflow and outflow
- Early days (pre 2003) – just grab samples, quarterly
- Today – Full storm, flow weighted composite samples, monthly sampling
- Automated samplers, flow measurement
- Install sampler stations, flow measurement structures
- Logistics – staff, cost equipment, timing & sizing the storm


**Monitoring Costs**

- Can get expensive

- Equipment cost per station ~ $7500, FY14 = 29 stations

- Laboratory Costs ~ $275 per sample

- Staff costs ~ $245 per sample

- FY14 projected samples ~ 303

- FY14 program costs ~ $157,000 for 11 SCMs

- FY04 Equipment Purchase - $269,000 for 34 samplers
Data Analysis

**Wet Ponds**
- Averaged 71% TSS, 21% Total Nitrogen, and 29% Total Phosphorus removals

**Wetlands**
- Averaged 77% TSS, 40% Total Nitrogen, and 55% Total Phosphorus removals

**Bioretention**
- Averaged 71% TSS, 32% Total Nitrogen, and 31% Total Phosphorus removals
Data Analysis

Dry Detention

• Averaged 52% TSS, 12% Total Nitrogen, and -15% Total Phosphorus removals

Level Spreader

• Averaged 66% TSS, 20% Total Nitrogen, and -2% Total Phosphorus removals
Data Analysis

Hydrodynamic Separators

• Eleven (11) SCMs monitored
• Average watershed size 2 - 3 acres
• TSS removals ranged from 0 – 55%
• Low inflow concentrations may be a factor
• Good SCM for floatables, oils, spill containment
Pilot SCM Policy

• Guides how we may approve Pilot SCMs within Private Development Projects

• SCMs are usually proprietary or innovative type

• Currently limited opportunities for in-line filter type and/or infiltration type SCMs

• Other innovative SCMs may include green roofs or pervious pavements

• Hydrodynamic type SCMs no longer an option

• Pilot SCMs must be designed and sized to meet requirements of PCCO, detention plus 1” water quality storm
Pilot SCM Policy

- Pilot SCM type must be reviewed and approved prior to beginning project design
- Pilot SCMs must be designed to be monitor-able per City specifications
- Developer must grant monitoring easement to City – usually within PCCO - O & M Agreement/Easement
- Developer must provide long-term maintenance of SCMs as required by PCCO
- Proprietary Vendor must provide written certification on SCM installation
- Developer must provide system & SCM cleaning prior to CO Approvals
Questions

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