

# Watershed Protection Ordinance (WPO) Stakeholder Meeting:

## Hydrology, Part 2

May 31, 2013

Photo: Texas Parks & Wildlife  
Lake Travis at 46.52 feet below normal.

# Meeting Objectives

- **Review existing hydrologic options**
- **Review and add to new/improved options**
- **Prioritize new/improved options**
- **Chart course (schedule) for improvements**

# Meeting Agenda

11:00- 11:10  
[10 min.]

**Arrivals & Introductions**

11:10- 12:00  
[50 min]

**Staff Review of Options**

12:00- 12:10  
[10 min.]

**Break**

12:10- 12:45  
[35 min.]

**Prioritize Options & Set Schedule**

12:45- 1:00  
[15 min.]

**Wrap-Up**

# Criticisms of Current Austin Hydrologic Approach

- Low impact approaches hard to permit; old-school “end of pipe” approach easy to permit
- Conservation not a focus/missing a big opportunity
- Infiltration not required (except BSZ/SOS\*)/ full range of hydrologic change not addressed
- Some key hydrologic options not given credit and/or not allowed
- Water quality controls don’t get much/any flood detention credit (except wet ponds)

\* BSZ = Barton Springs Zone; SOS = Save Our Springs Ordinance

# Traditional Stormwater Options (ECM 1.6.5 & 1.6.6)

## 1.6.5 Sedimentation Sand Filtration

- Austin's Main WQ control: 83% of all WQ controls; 2,500+ in service!
- Basic; familiar to design, build, maintain
- Good solids removal & erosion detention
- Drains in 48 hours; limited benefit to baseflow
- Can serve up to 50 acres drainage (end of pipe)
- Requires professional maintenance
- Poor aesthetics/single function
- Poor dissolved pollutant performance, e.g., nitrogen

# Traditional Stormwater Options (ECM 1.6.5 & 1.6.6)

## 1.6.6 Wet Pond

- Longstanding, high-profile control (6% of all WQ controls; 180+ in service)
- Can be amenity, serve large drainage areas
- Provides aquatic habitat
- High cost to build, maintain, keep wet
- Requires specialized maintenance/expertise
- Must serve a relatively large drainage area
- Accommodates flood detention in same basin

# **Green Storm Water Quality Infrastructure: Current Options (ECM 1.6.7)**

- A. Retention-Irrigation**
- B. Vegetative Filter Strips**
- C. Biofiltration**
- D. Rainwater Harvesting**
- E. Porous Pavement for Pedestrian Use**
- F. Rain Gardens**



# Green Storm Water Quality Infrastructure: Current Options (ECM 1.6.7)

## **A. Retention-Irrigation**

- Main WQ control to comply with SOS Ordinance
- Multiple concerns with installation, maintenance
- Simpler, more passive alternative would be desirable

## **B. Vegetative Filter Strips**

- Good concept; useful with low imperviousness
- May be very large relative to drainage area served
- Uneven installation & maintenance concern



# Green Storm Water Quality Infrastructure: Current Options (ECM 1.6.7)

## C. Biofiltration

- “Greener” alternative to sand filter; plants beneficial
- Very similar to sand filter; “end of pipe”

## D. Rainwater Harvesting

- Excellent concept; flexible placement
- Need area to irrigate or otherwise use water
- Required 5-day drawdown time limits practicality
- Lower cost of potable water limits attractiveness

# Green Storm Water Quality Infrastructure: Current Options (ECM 1.6.7)

## **E. Porous Pavement for Pedestrian Use**

- Excellent concept; some installation & longevity concerns
- More frequent installations should improve
- No credit for non-pedestrian applications

# Green Storm Water Quality Infrastructure: Current Options (ECM 1.6.7)

## F. Rain Gardens

- High interest/demand
- Flexible placement, can be landscape feature
- Infiltration & underdrain options
- Max. drainage area = 2 acres
- Max. depth = 1 foot (thus larger relative footprint)
- Not permitted for use with single-family residential (longevity & maintenance concerns)

# Improved Hydrologic Options

- VBH** 1. **Limit storm runoff volume** (e.g., infiltrate, re-use, etc., a portion of WQ Volume on-site)
- GSI** 2. **Rain gardens for single-family residential**
- GSI** 3. **Alternatives (rain gardens?) for SOS compliance**
- GSI** 4. **Rainwater harvesting** for conservation & water quality
- VBH** 5. **Rainwater harvesting + green roof irrigation** (also flood detention credit)

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# Improved Hydrologic Options

- GSI** 6. **Porous pavement** for non-pedestrian surfaces
- VBH** 7. **Flood detention credit** for water quality controls
- LID/  
VBH** 8. **Impervious cover credit** for rainwater harvesting catchment and/or tank areas
- VBH** 9. **Volumetric Flood Detention** (add to Drainage Criteria Manual as option)
- LID** 10. **Skinny Streets/Green Streets** (Imagine Austin LDC)

# Limit Storm Runoff Volume/ Incentivize Beneficial Re-Use

- Provide benefits of predevelopment hydrology and/or water conservation
- Infiltrate a portion of WQ Volume on-site (how much?) and/or
- Re-use water on-site for irrigation, chillers, toilet flushing, make-up water, etc.
- Other national (Maryland; Tucson, AZ) and international (Berlin) models
- Would require code change

# Rain Gardens for Single-family Residential Lots

- Put in drainage easement
- Ensure access is provided & safe for inspection and maintenance (i.e., not behind private fences, guarded by dogs, etc.)
- Assign preventive (routine) maintenance responsibility: City? Property owners?
- Assign corrective (heavy) maintenance responsibility: City? Property owners?
- Determine how City inspections to be done: complaint basis only?



# Alternatives (Rain Gardens?) for SOS Compliance

- Provide needed alternative to retention-irrigation
- Consider methods to minimize pollutant export (non-degradation): Shallow depth? Native vs. imported soils?
- Rain gardens? Low-pressure dose system? Gravity? AMD design?
- Community discussion: non-degradation
- Staff currently revising ECM to provide guidance on demonstrating no increase loading for alternative systems. Will provide guidance on allowable BMPs. Draft by Oct. 1, 2013

# Rainwater Harvesting for Conservation & Water Quality

- Possible now to build systems for both conservation and water quality...
- ... But guidance is not explicit in ECM
- Simple approach to model rainwater harvesting systems for “equivalency” to sed-sand filters
- Enormous promise: integrate water quality and conservation; importance of water in future
- Revision of ECM to include development of calculator to demonstrate volume/load reduction for compliance with sed/fil equivalence and/or non-degradation based on annual average rainfall/runoff/daily water use

# Rainwater Harvesting + Green Roof Irrigation

- Green roofs offer multiple benefits beyond stormwater management: cooling, habitat, green space, beauty, sense of wellbeing, etc.
- Especially attractive for dense, urban areas (hence inclusion in Downtown Density Bonus system)
- Stormwater management: green roof serves as irrigation area; tank serves as “pond” (retention)
- Rain harvesting helps resolve concerns about water conservation and nutrient export
- Criteria would encourage more WQ applications
- Criteria for flood mitigation (e.g., time of conc.)

# Porous Pavement for Non-pedestrian Surfaces

- Long an option in other US communities
- Installation and longevity concerns not likely to be resolved until more experience gained (“catch 22”)
- Could especially help small and/or tight sites
- Groundwater contamination concerns minimal over eastern clay soils
- Staff considering allowing WQ credit for use in parking lots, interior roadways

# Flood Detention Credit for Water Quality Controls

- City staff recognizes some benefits exist
- WPD and PDRD staff working on now:
  - Brentwood Study
  - Developing spreadsheet calculator and guidance document that incorporates DCM methodology for calculating detention credit for small-scale distributed controls

# Impervious Cover Credit for Rainwater Harvesting Catchment and/or Tank Areas

- Want to incentivize use of rainwater harvesting (conservation, etc.)
- Barton Springs Zone Regional WQ Plan favored
- Similar challenges to rain gardens for single-family application: inspection access, ensure maintained, ensure exists, etc.
- Complex issue to grant impervious cover “credit” (cap?) and not just WQ control function
- Small, helpful steps possible? Don’t count tank as IC? Allow in setbacks?

# Skinny Streets / Green Streets

- Promising way to reduce impervious cover, increase infiltration, times of concentration, etc.
- Staff working through technical details regarding flood conveyance
- “Green streets” a great concept; very complex intersection of multiple missions: autos, bicycles, pedestrians, trees, water & wastewater, drainage, electrical, parking, and on and on...
- Working on with Transportation Criteria Manual, Subdivision (connectivity) Code, and (later) Imagine Austin



# What is needed? Most important?

- How should we prioritize these topics? (Which to talk about first?)
- Is something missing or not needing to be “fixed”?
- What do you need more information on?
- What is a good meeting format?
- Discuss code vs. criteria process.

# Phase 1 WPO Adoption Schedule

Council Resolution	January 2011
Stakeholder Meetings: Input	Sep. 2011 – April 2012
Staff develops Draft Ordinance	April – November
Stakeholder Meetings: Phase 1 Draft Ordinance	Dec. '12 – May '13
Stakeholder Meeting: Review Draft Ordinance	June 14
Planning Commission: Codes & Ordinances (Briefing)	June 18
Environmental Board	June 19
Planning Commission: Codes & Ordinances (Action)	July 16
Planning Commission	July 23
City Council	August 22
Travis County Commissioner's Court (Title 30)	Fall

# Contact Information

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<http://www.austintexas.gov/page/watershed-protection-ordinance-0>