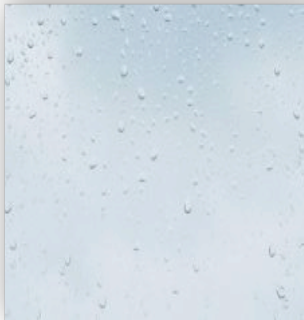
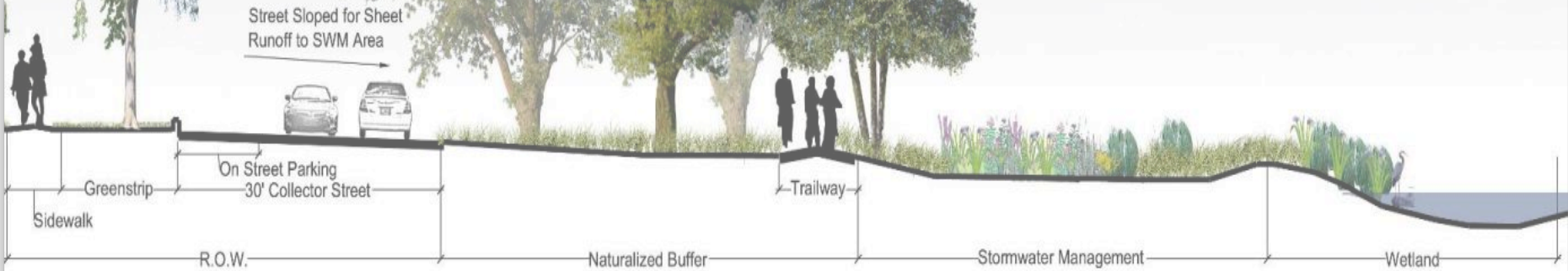


Urban Conservation

Eric Schmechel

Dubuque Soil & Water Conservation District

June 27th 2013



Precipitation



Rain
Garden



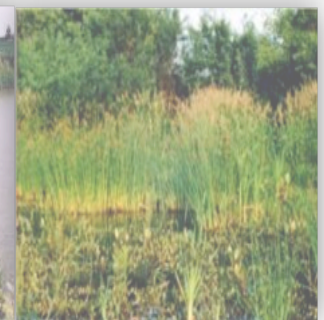
Bio-Swale



Cleansing
Meadow Buffer



Naturalized
Detention
Basin



Treatment
Wetland

Purpose and History – WHY?

- ✘ Catfish Creek (Trout Stream) Watershed Project – (Goals and Objectives) – Now the CCWMA
- ✘ Dubuque County Erosion Control and Stormwater Ordinance
- ✘ Iowa's Native Hydrology...Why Infiltration?
- ✘ Build Support – Educate – Consensus







Waverly hospital rain water detention pond
Pond built 2003. Picture taken 1-13-04.

Dubuque County ESC and Stormwater Ordinance

- 0 Dubuque County passed E/S Ordinance and Post-Construction Ordinance in March 2010.
- 0 One of the First Counties in Iowa to pass own ordinance
- 0 Originally – only to include Headwaters of Catfish – Why Not all of Dubuque County?



Why the County level?

- ❑ Allows County officials to make better decisions regarding development and runoff
- ❑ Play a “local” role in protecting Quality of Life for residents
- ❑ Lack of Regulation
- ❑ Water Quality
- ❑ Flash Flooding
- ❑ WQ Challenges

City of Dubuque vs. Dubuque county

- 0 City of Dubuque (MS4) Phase II
- 0 Erosion & Sediment Control Ordinance in Place
- 0 Smaller Communities - ↑ Development Rate
- 0 Motivates Sprawl
- 0 Uneven Playing Rules



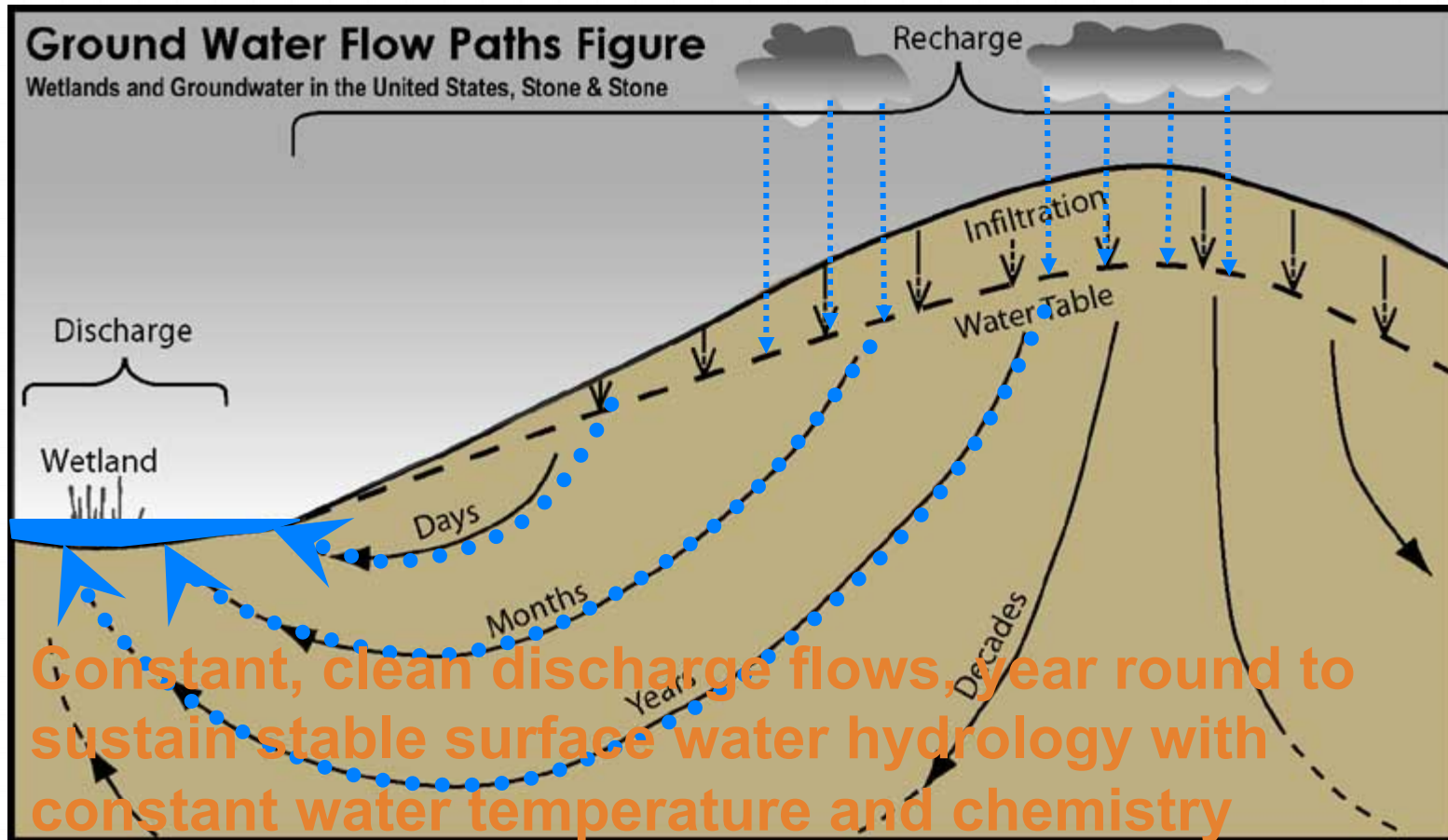
Performance standards....

- ✘ Based off Volume-Based Hydrology
- ✘ Post-development runoff shall be infiltrated such that a rainfall depth of 1.25 inches is recharged to the ground (*Recharge Volume, Rev*). Infiltration shall be limited to the volume infiltrated in 24 hours.
 - + Exclusion: If the site is unsuitable for infiltration as determined by the County Engineer, the *applicant* may submit engineering evidence such as clay soil or karst that may suggest that the site may require alternative infiltration practices such as a treatment train.

Historical Patterns of Hydrology

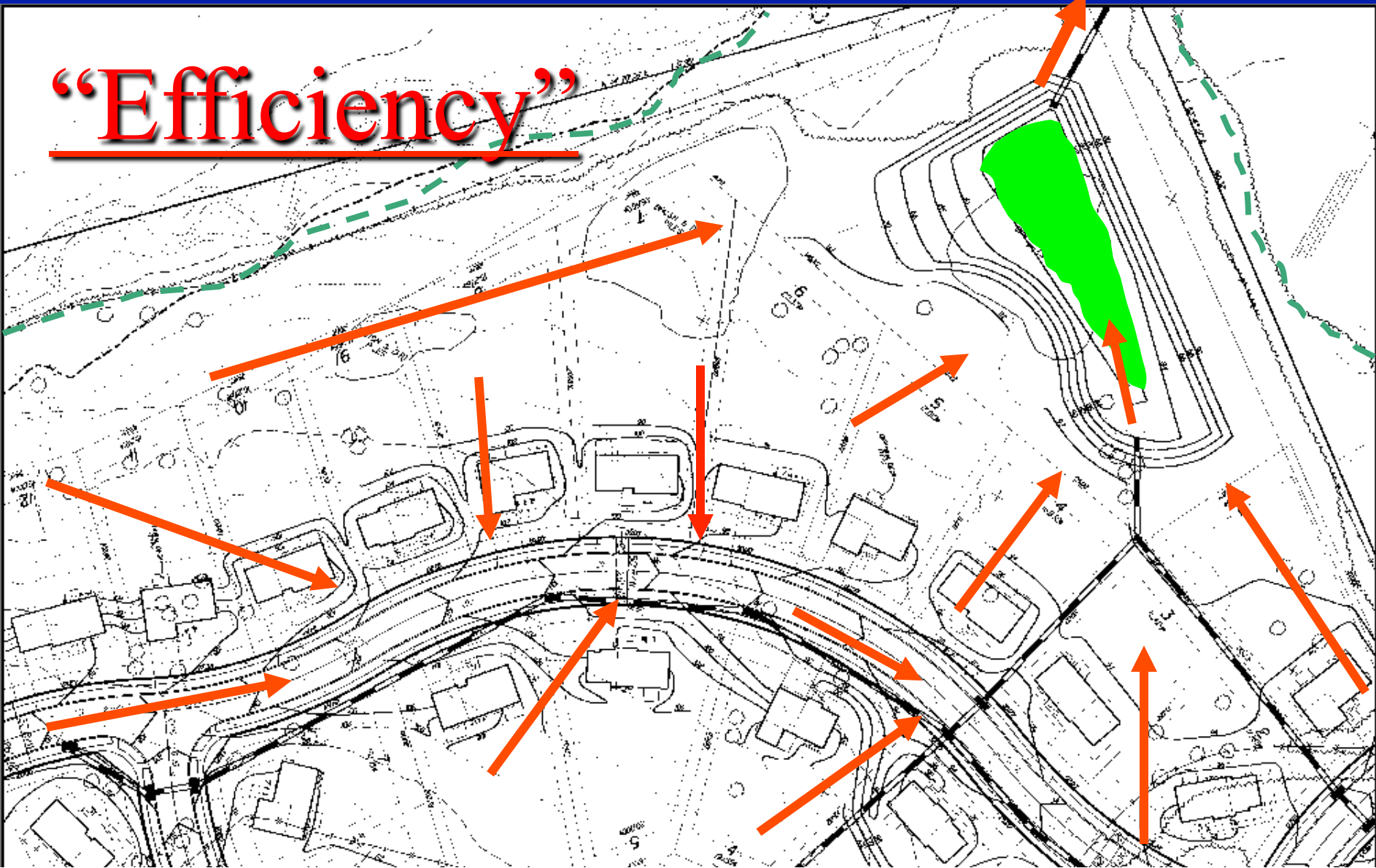
Recharge Zone: Uplands

Discharge Zones: Lowlands- rivers, streams, ponds, wetlands

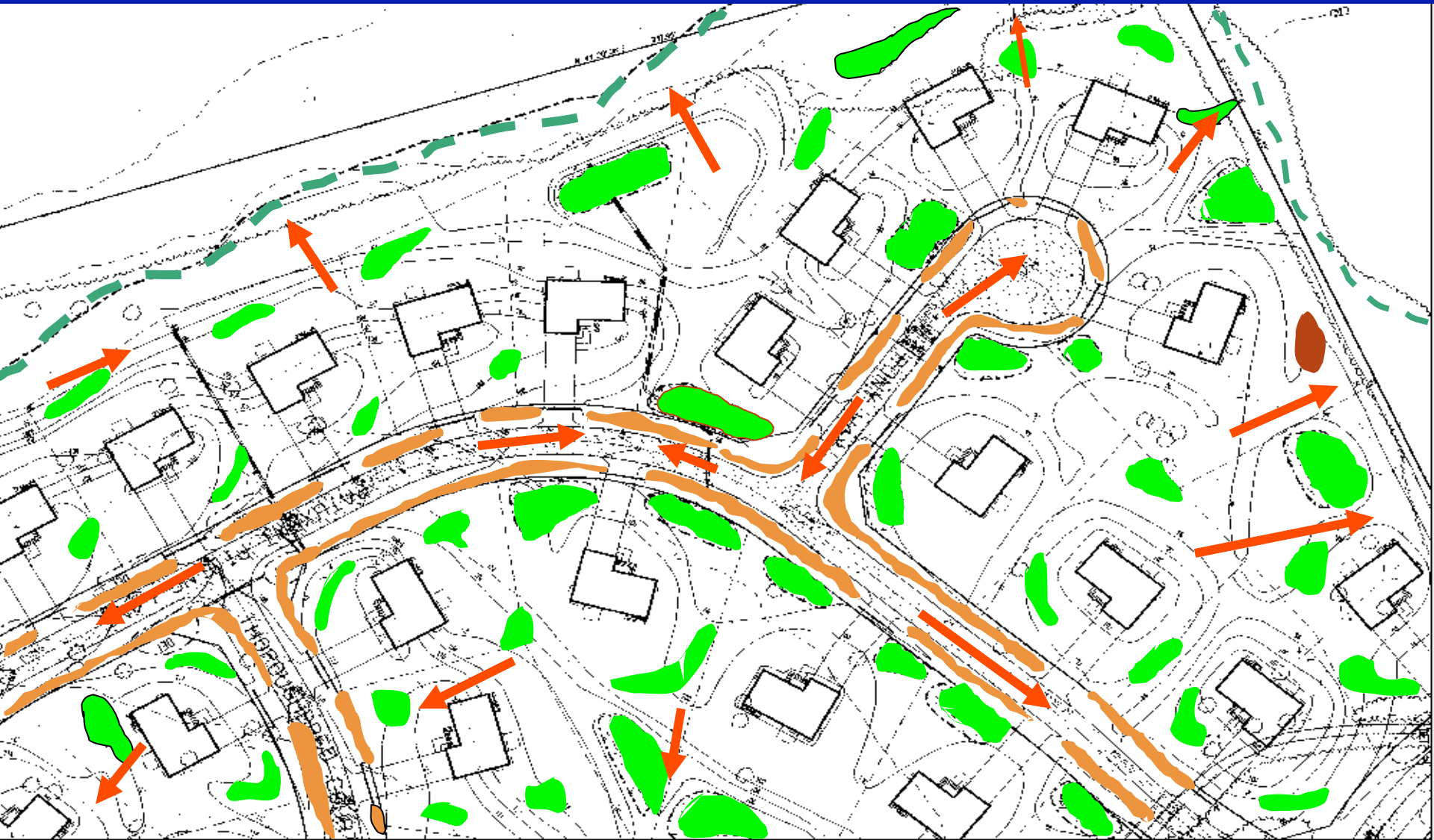


Conventional Pipe and Pond Centralized Control

“Efficiency”



Distributed Small-scale Controls



Maintaining Natural Hydrology Functions

Iowa Stormwater Management Manual

- 0 Rain Gardens
- 0 Bio-Retention
- 0 Bioswales (Vegetated Swales)
- 0 Green Roofs
- 0 Permeable Transportation Surfaces (City of Dub – 73 green alleys, Airport Terminal, Subdivisions)
- 0 Detention (Slower Release – Tiered System)
- 0 (Encouraging reduction of Impervious)

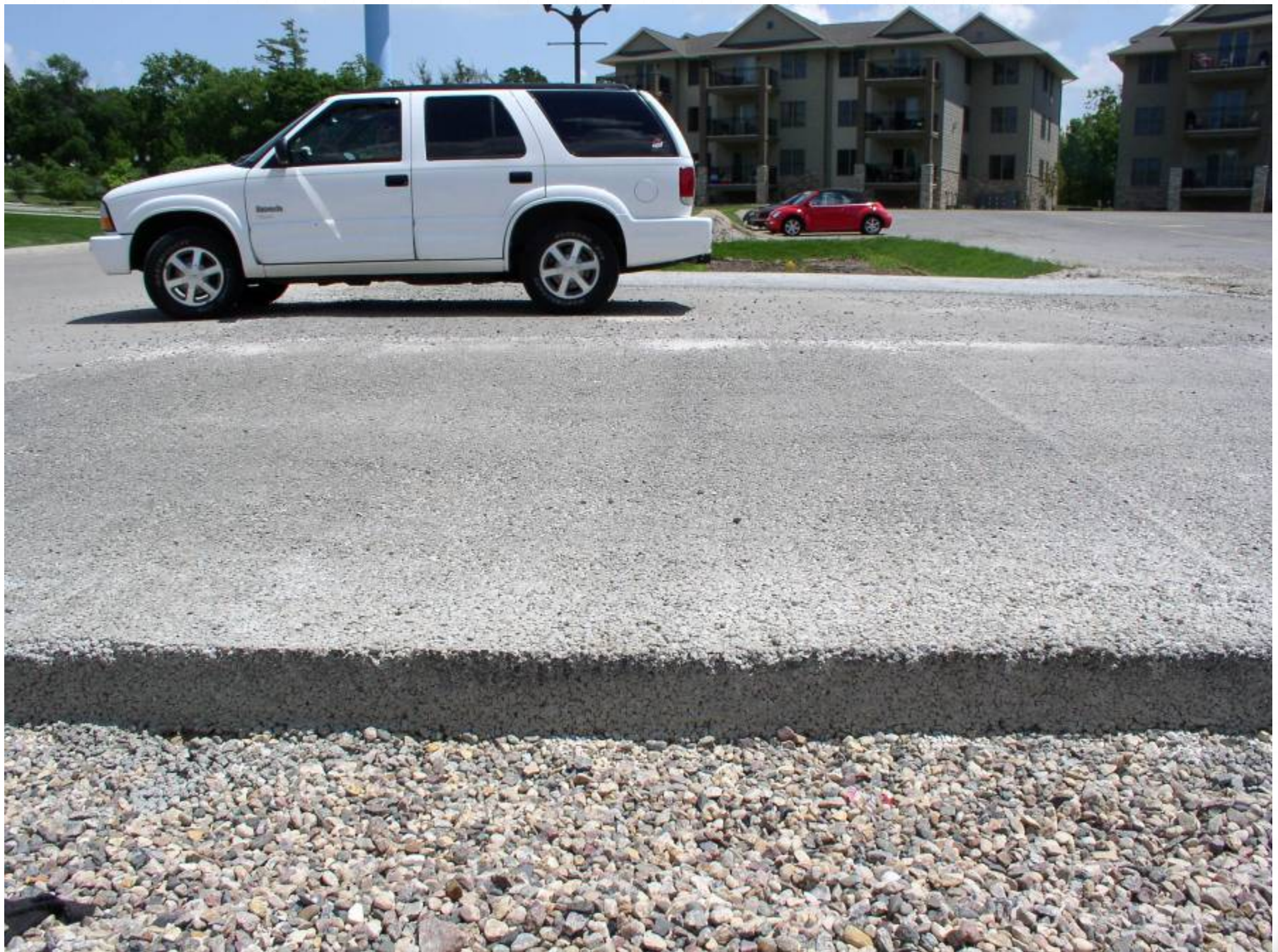
Swiss Valley Pervious Asphalt







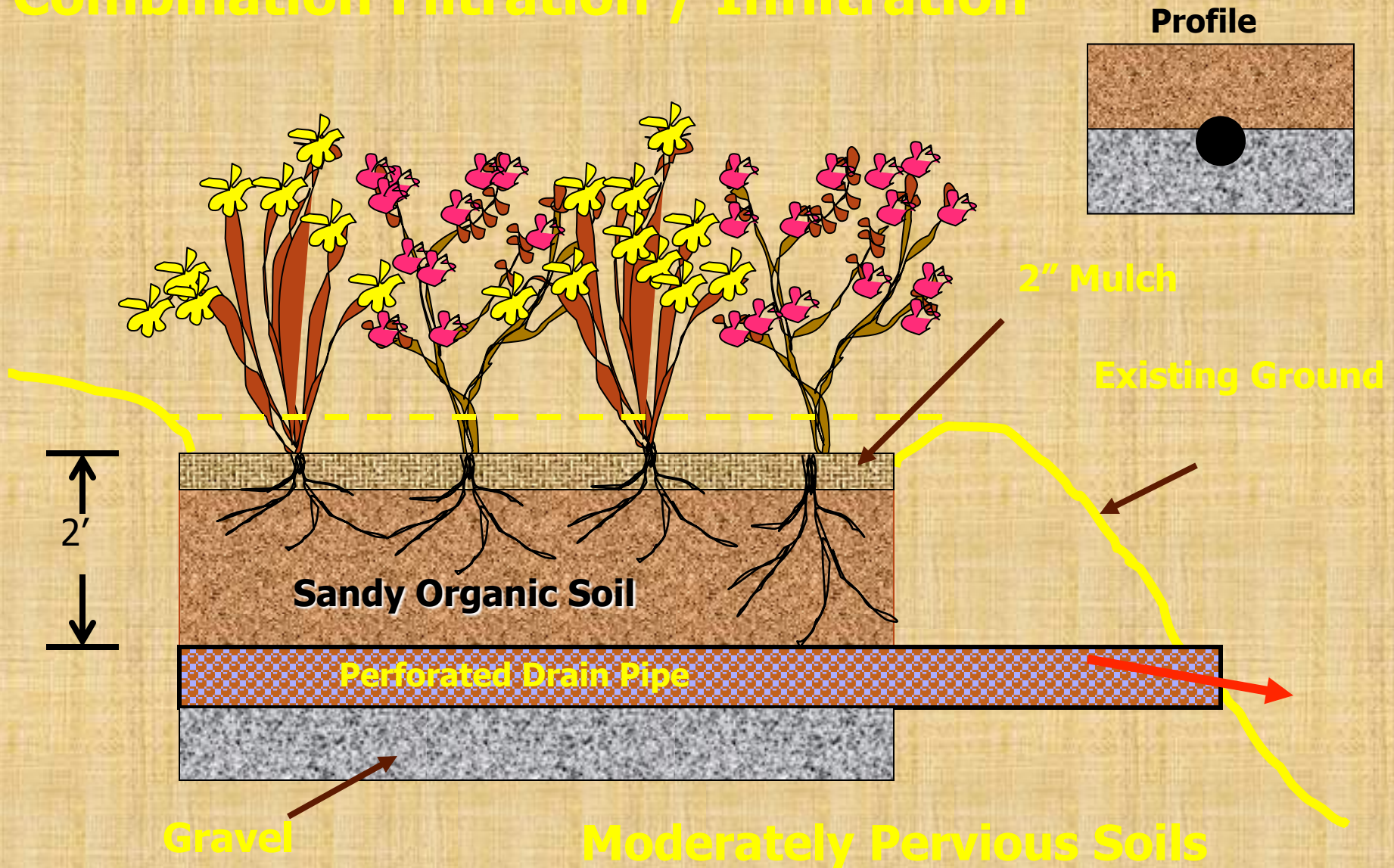




Bio-retention

(Infiltration Cells)

Bio-retention Cells: Combination Filtration / Infiltration



























8. 2. 2004

ENGINEERED SWALES



- Open, above-ground systems are easier to maintain & troubleshoot
- Installation costs are favorable compared to piped drainage

Seattle's Street Edge Alternatives Program



After Completion - January 2001



- **Infiltrates most rainfall**
- **Convey 25-yr., 24hr storm**
- **Enhance Water Quality**
- **Decrease Runoff By 98%**



Whispering Meadows Subdivision

- 0 Newest Subdivision in Upper Catfish Creek
- 0 Roughly 20 acres; 10 lots
- 0 Worked with Developers, County Zoning, and Board of Supervisors
- 0 Developers agreed to incorporate BMPs into each lot in the subdivision – written in covenant of subdivision
- 0 Landowner will be able to choose what practice they would like to install – Rain Garden, Native Landscaping or Soil Quality restoration
- 0 Pilot Project for Dubuque County – 1st Rain Garden Street

North Fork Trails Subdivision

- 0 First Permeable Pavement Street in Iowa...(2008)
- 0 Detention is under cul-de-sac
- 0 Low Interest Loan – Private Developer Funded Project





Challenges

- 0 Modeling “unknowns”
- 0 Acceptable Criteria (engineers)
- 0 Maintenance Agreements – Homeowners – City – County
- 0 BMP Specifications – Construction Installation
- 0 Working With Developer/Builder/County/Homeowner

Current Projects

- 0 Dubuque Terminal Airport – 12 Bio-Retention Cells – Permeable Pavement (Long-Term Parking)
- 0 City of Asbury – Bio-swale (Detention Improvements)
- 0 City of Epworth – Bio-Cells (Rain Gardens)
- 0 City of Dubuque – 75 Permeable Paver Alley's (Green Alleys) 9.2 Million SRF Funding
- 0 Cedar Crest Subdivision – 30 Rain Gardens (Covenant)
- 0 Streambank Stab (City of Asbury)

Questions and Comments

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