



STORMWATER IRRIGATION

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Outline

- What and Why?
- Examples
- Design Considerations
- Benefits
- Conclusions

What and Why?

Water from surface or groundwater sources used for non-potable purposes, like irrigation.

Characteristics: (the top ten reasons)

1. Used when reclaimed water is insufficient to meet demand.
2. Can have a utility and be a profit center.
3. Can reduce mass discharges from regional areas.
4. A LOS (level of service) is not needed but you can get one.
5. Florida Public Service Commission will grant rates, charges, and a service area, but not required - governments exempt.

What and Why?

(continued)

Water from surface or groundwater sources used for non-potable purposes, like irrigation.

6. Can save Potable Water.
7. Can use small individual sources, each less than or equal to a supply of 100,000 gallons per day does.
8. If using a well, the pipe diameter is typically 4 inches or smaller.
9. If 7 and 8 above is true, then no consumptive use permit, if not, then permit needed.

Green Roofs for Pollutant Tradeoff

Disconnect DCIA with Green Roofs



Green Roof with water harvesting
Stormwater mass and volume control

12443

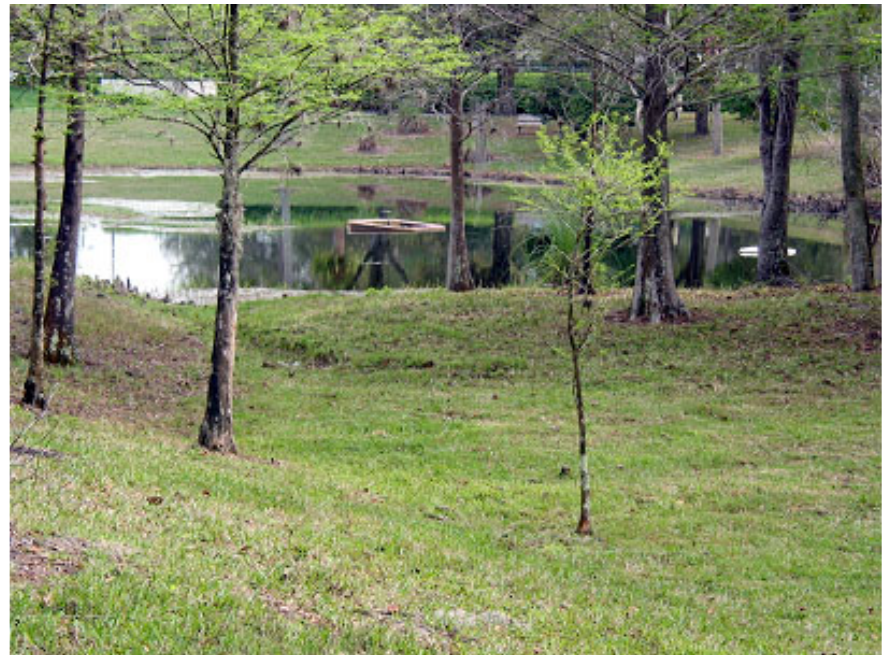


**orlando
tech
center**



Storage of 8" of run-off
from the directly
connected impervious
areas

Storage water
used to irrigate
lawns and wash
vehicles



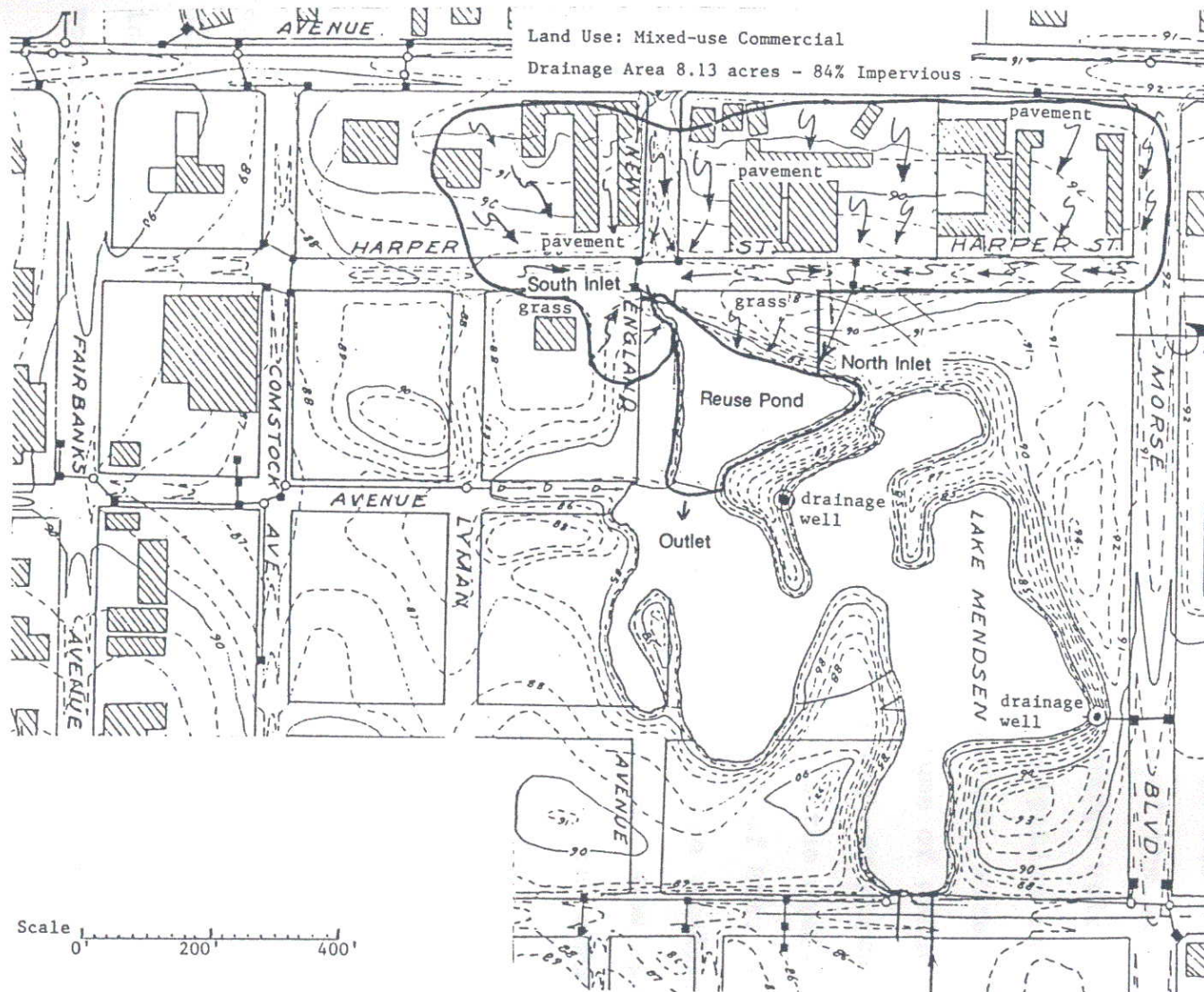


Figure 4-3. Watershed Detail



PRE-CONDITION NEGLECT



RESTORATION-IN-PROGRESS
WATERSHED AREA AND POND



SHORELINE BEFORE
REVEGETATION



SHORELINE AFTER
REVEGETATION



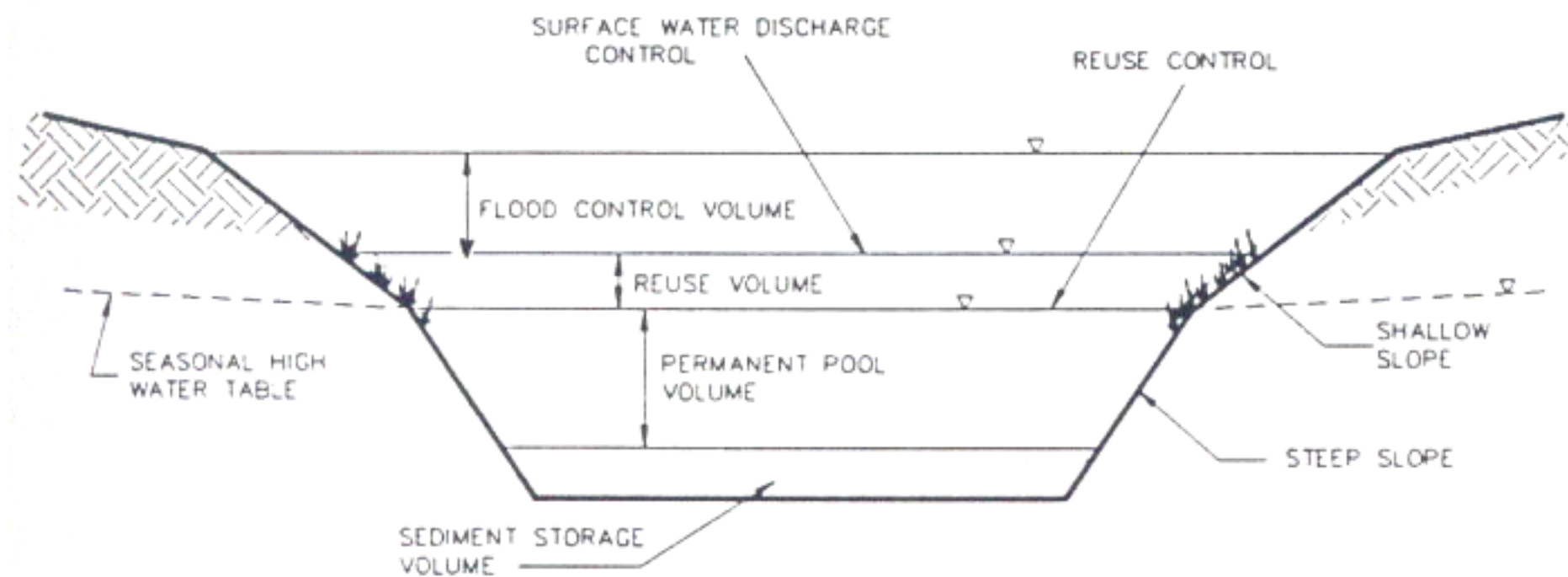
COLLECTS RUNOFF WATER

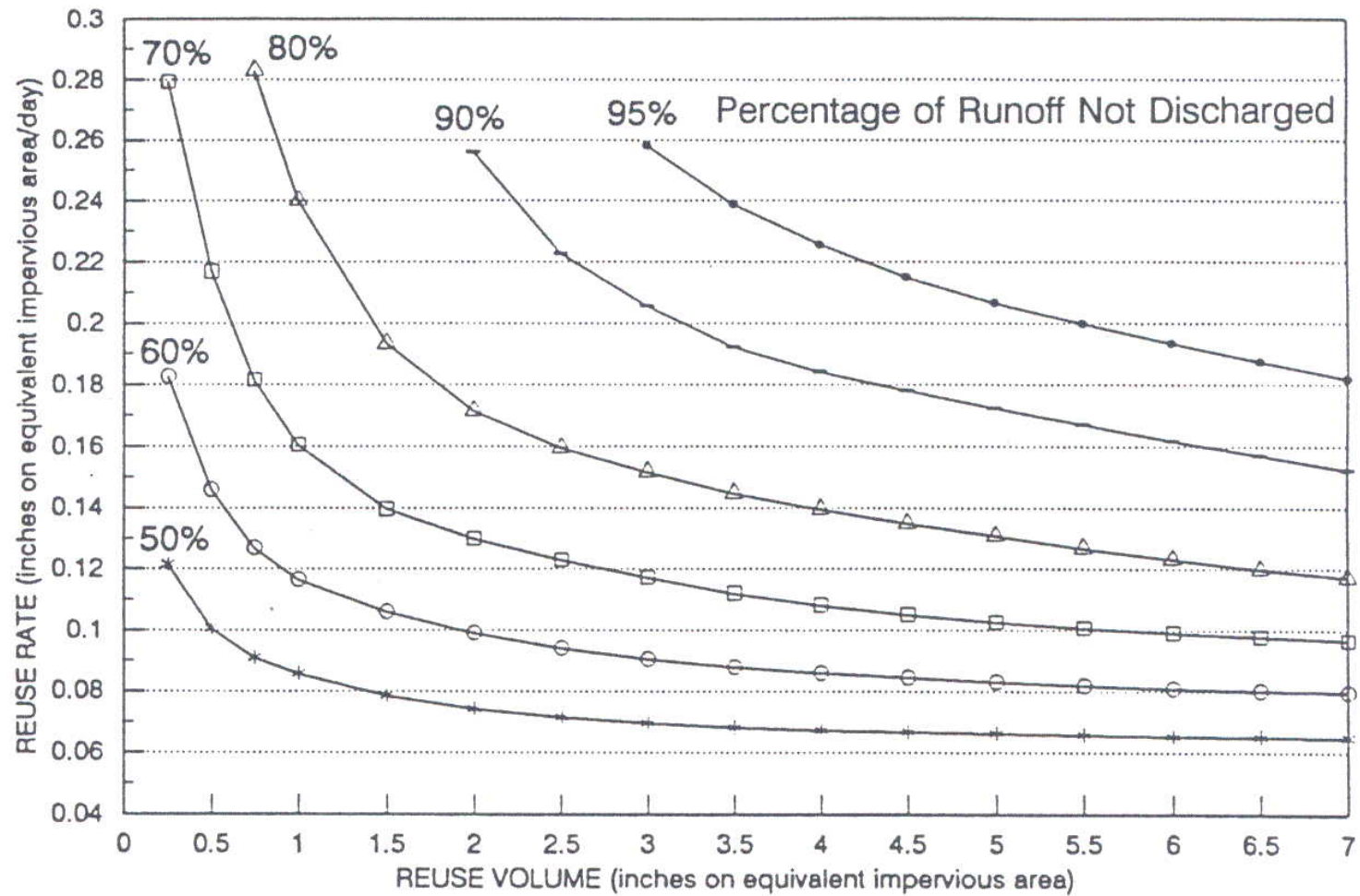


CONTROLS POLLUTION



AND REUSES THE WATER





ORLANDO RAINFALL STATION
MAY 1974 - DEC. 1988
MEAN ANNUAL RAINFALL = 48.2 in



Precipitation, Inter-event
Dry Periods and Reuse
Design Curves for
Selected Areas of Florida

By

Martin P. Wanielista

Yousef A. Yousef

Gregory Harper

Teresa R. Lineback

Linda Dansereau

Available from The
Stormwater Academy
www.stormwater.ucf.edu

South Bay Utilities Inc.

- Upscale residential irrigation demand
- No CUP
- No FPSC
- No FDEP



- 50¢/1,000 gallons not certified
- Shallow wells
- Customer agreements
900 homes - HOA
- Coastal / fragile resource

Schroeder Manatee Utilities, Inc.

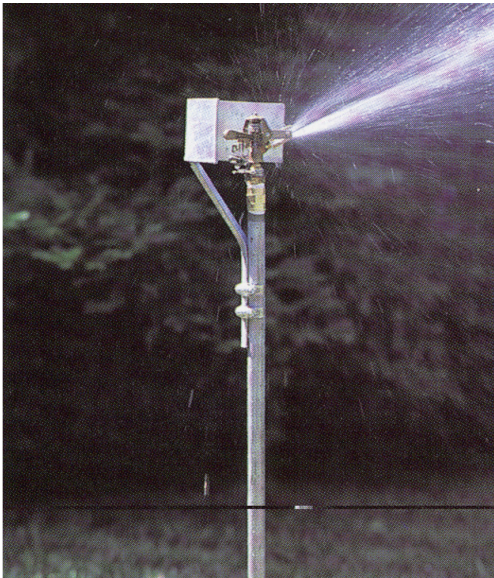
- Approximately 32,000 acre service area
- Lower potable water requirements
- Exclusive service area



- 27¢/1,000 gallons FPSC
- Horizontal wells, lakes, canals, shallow 4" wells
- Use of approximately 4 MGD

East Central Florida Services, Inc.

- Approximately 550,000 acre service area
- Resource protection and management
- Exclusive service area



- 19.2¢/1,000 gallons FPSC
- Canal, surface water and groundwater sources
- Use of approximately 20 MGD

Design Considerations

1. Users and use characteristics

- a) when is water needed, freeze protection, dry season supplement, other
- b) non metered vs. meter
- c) pressure
- d) volume, rate
- e) additional treatment (at point of use)

Design Considerations

2. Source

- a) Collection system underdrain, horizontal drainage wells, shallow wells, deep wells, ponds, canals and reclaimed water (power plant, wastewater, etc.)
- b) Volume and rate
- c) Water quality, chlorides, corrosivity, calcium and magnesium hardness, pKs, metals (iron etc.) and odors (H_2S etc.), bacteria and virus content.

Design Considerations

3. Regulatory Thresholds

- a) Water use permit > 4"
- b) 100,000 gallons/day
- c) FDEP – if mixed with reclaimed H₂O
- d) Right of way utilization easements

Design Considerations

4. Size of Pond and Performance

- a) Mass Balance $IN-OUT=Storage\ Change$
- b) Consider all inputs and outputs
- c) Consider also the availability of alternative supplies to increase reliability.
- d) Simulations

Design Considerations

5. Others

- a) Electrical Power Feeds
- b) Interconnection valves and meters, blow offs, grit removal
- c) Ground soil conditions to include porosity, type and others
- d) More, but site specific

Benefits

1. Very cost effective, home owners pay less, \$.50 versus \$2.00, and a Utility can make money.
2. Reduces pollution (TMDLs)
3. Regional tradeoff potential
4. Preserve potable water sources
5. Maintains hydrologic balance and Uses natural cleansing processes

Benefits

6. Local sources first, Chapter 40 FAC
7. Use of lowest quality water for lowest quality need
8. Can be used to re-hydrate wetlands
9. Others

Conclusions

1. An alternative water source
2. Least economic burden on a community
3. Proven Technology
4. Can help in pollutant trading

The best water resources option
that you have not considered

Additional information
www.stormwater.ucf.edu

