

## Stream & Wetland Restoration + Regenerative Stormwater Conveyance = Significant Functional Uplift



2017 Conference  
15 March

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Senior Project Manager



## Restoration & BMPs: Little Jackson Creek, SC

- Introduction
- Airport Impacts & PRM
- Stakeholder Involvement
- BMP Integration
- Hurricanes
- Monitoring/Functional Uplift







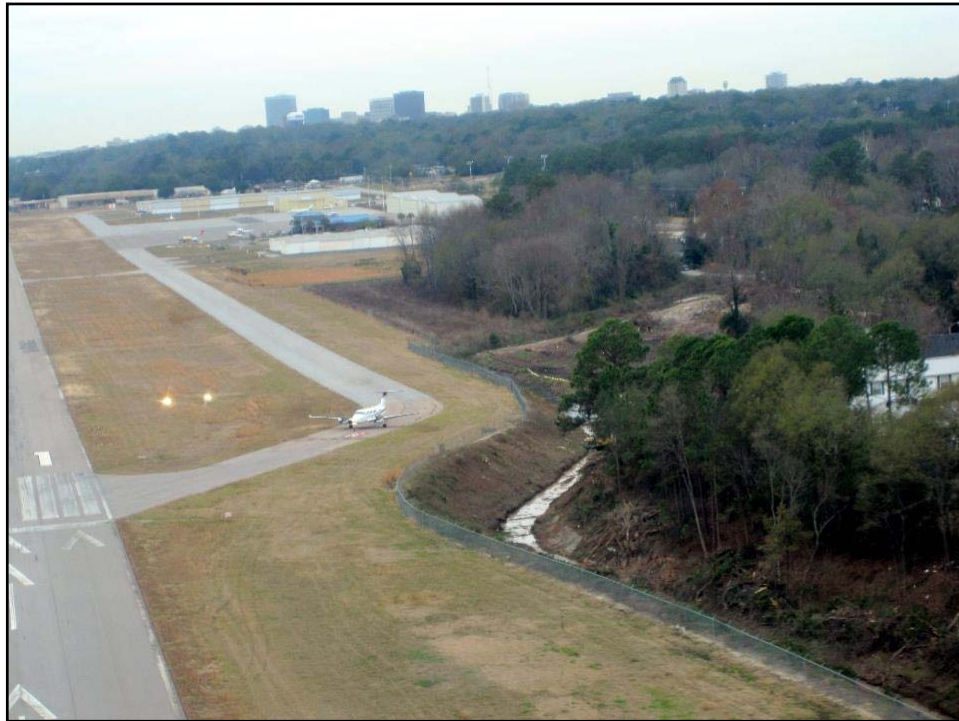




Table 7. Required Wetland Mitigation Credits		
Factor	A (Bottomland Hardwood)	B (Cleared Herbaceous)
Lost Type	Type A (3.0)	Type C (0.2)
Priority Category	Tertiary (0.5)	Tertiary (0.5)
Existing Condition	Partially Impaired (2.0)	Impaired (1.0)
Duration	Over 10 Years (2.0)	Over 10 Years (2.0)
Dominant Impact	Fill (3.0)	Fill (3.0)
Cumulative Impact	1.0-2.99 Acres (0.5)	1.0-2.99 Acres (0.5)
Sum of m Factors	11.0	7.2
Impacted Area	1.29	1.12
R x AA	14.19	8.064
Total Required Wetland Mitigation Credits = $\sum (R \times A) =$		22.254
		

Table 9. Required Stream Mitigation Credits		
Factor	Culvert	Stabilization
Stream Type	All Other (0.4)	All Other (0.4)
Priority Category	Tertiary (0.1)	Tertiary (0.1)
Existing Condition	Very Impaired (0.1)	Very Impaired (0.1)
Duration	Permanent (0.3)	Permanent (0.3)
Dominant Impact	Pipe (2.2)	Morpho-Logic (1.5)
Cumulative Impact	501-1000' (0.40)	501-1000' (0.40)
Sum of R Factors	3.5	2.8
Linear Feet Impact	735	210
R x LL	2,572.5	588
Total Required Stream Mitigation Credits = $\sum (M \times LL) =$		3,160.5
		



April 2008

Compensatory Mitigation for Losses of  
Aquatic Resources  
40 CFR Part 332 (2008)

'08 Rule



Federal Register

Thursday,  
April 10, 2008

# Final Rule

Part II

## Department of Defense

Department of the Army, Corps of  
Engineers  
33 CFR Parts 325 and 332

## Environmental Protection Agency

40 CFR Part 230  
Compensatory Mitigation for Losses of  
Aquatic Resources; Final Rule



P

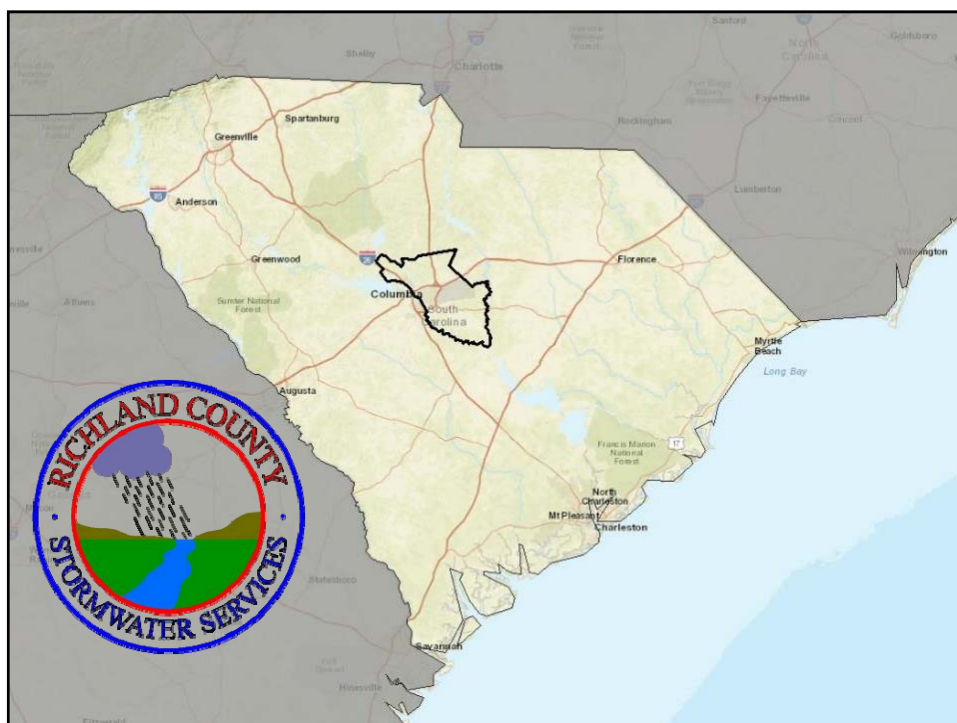
ermittee

R

esponsible



M

itigation







 U.S. Department of Transportation  <b>Federal Aviation Administration</b>	<h1>Advisory Circular</h1>	
	<b>Subject: HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS</b>	<b>Date:</b> 8/28/2007
	<b>Initiated by:</b> AAS-300	<b>Change:</b>
<p>1. <b>PURPOSE.</b> This Advisory Circular (AC) provides guidance on certain land uses that have the potential to attract hazardous wildlife on or near public-use airports. It also discusses airport development projects (including airport construction, expansion, and renovation) affecting aircraft movement near hazardous wildlife attractants. Appendix 1 provides definitions of terms used in this AC.</p>		
 community infrastructure consultants		



## FAA Advisory Circular 150/33B


### Minimum separations:

Piston-Powered: 5,000 feet

Turbine-Powered: 10,000 feet


Approach, Departure, and Circling  
Airspace: 5 mi.

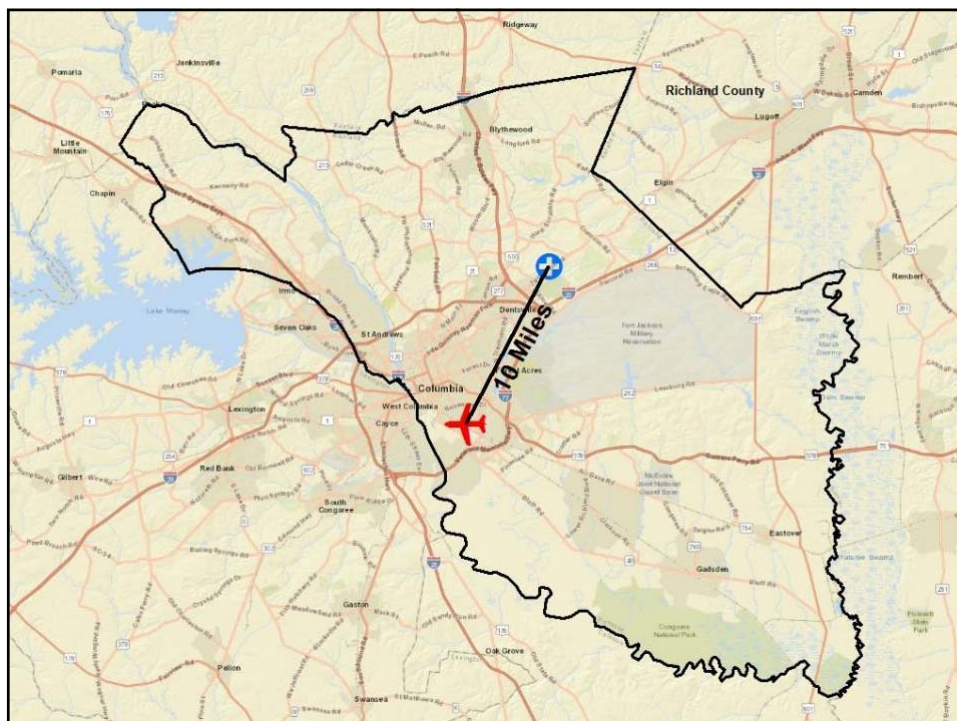




FAA Advisory Circular 150/33B

5 miles

  
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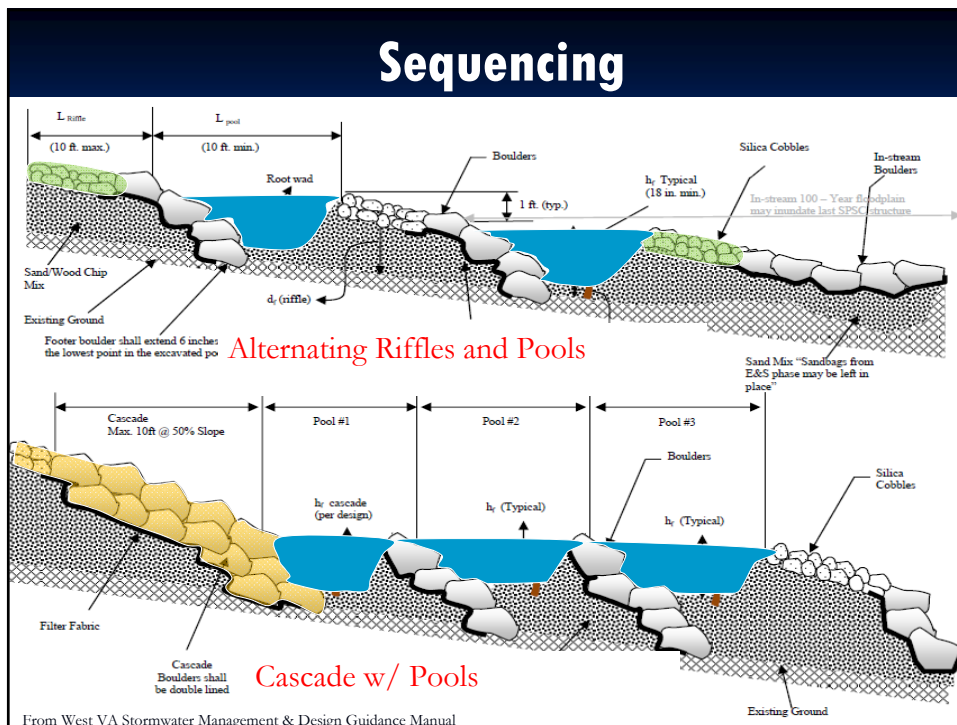




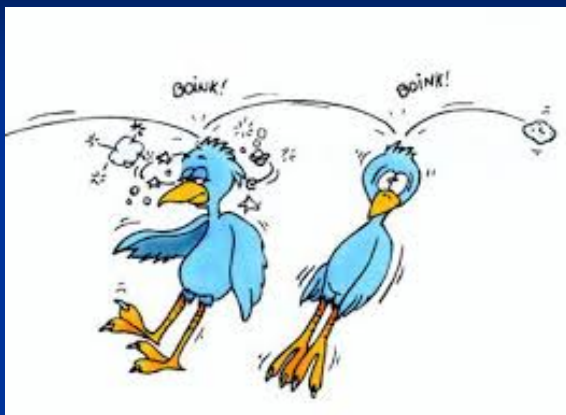


## Regenerative Stormwater Conveyance





## RSC – Two Birds, One Stone

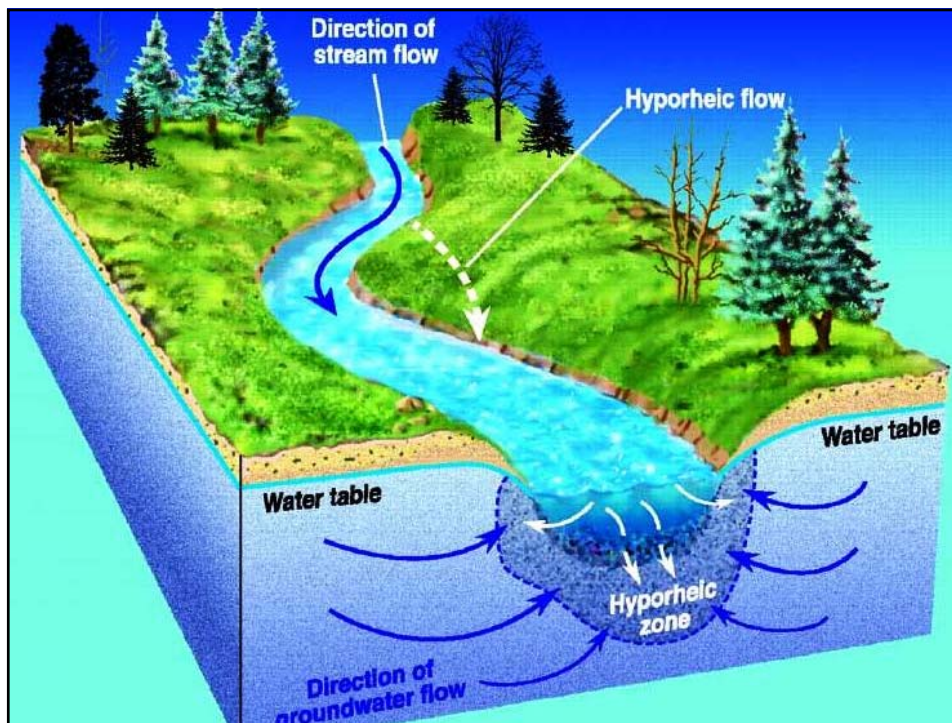


■ Quantity/velocity

AND

■ Quality





## Retrofit: RSC

### Regenerative Stormwater Conveyance

#### Substrate

- Infiltration
- Detention
- Filtering
- Nutrient uptake  
(anaerobic decomposition)



## Retrofit: RSC

### Regenerative Stormwater Conveyance

**Riffles, Pools and Cascades**

- Energy Dissipaters
  - Sedimentation
  - Reduce sheer stress
    - Lateral and vertical erosion





## Retrofit: RSC

### Regenerative Stormwater Conveyance

**Riffles, Pools, and Cascades**

- Grade Control
- Storage
  - infiltration
- Widen flow path
  - infiltration





## Retrofit: RSC

### Regenerative Stormwater Conveyance

#### Vegetation

- Native
- Nutrient uptake
- Aesthetics
- Energy Dissipation
- Bank/substrate

Stabilization (root mass)





**Retrofit: RSC**

**Regenerative Stormwater Conveyance**

**Effectiveness**

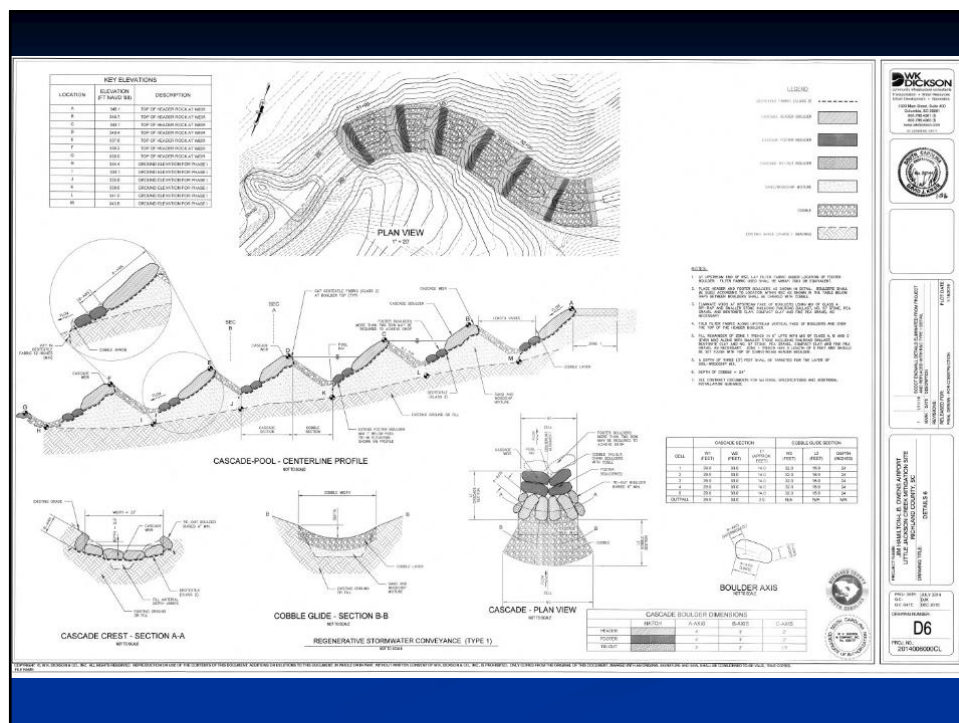
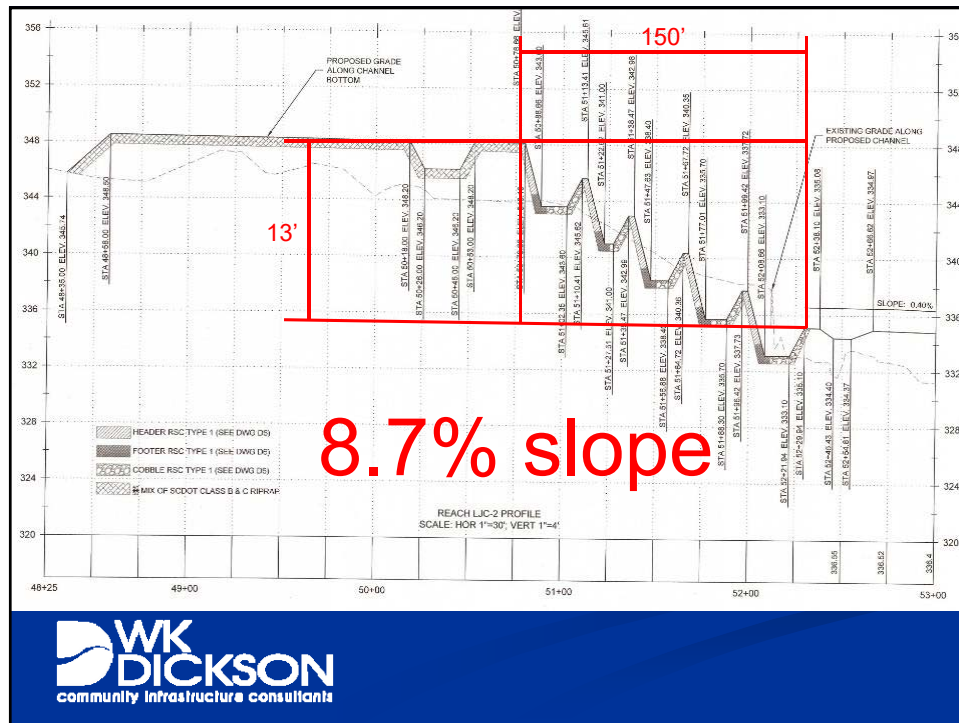
- RSC
  - 70% TP
  - 70% TN
  - 90% TSS
- Bioretention
  - 45% TP
  - 35% TN
  - 85% TSS

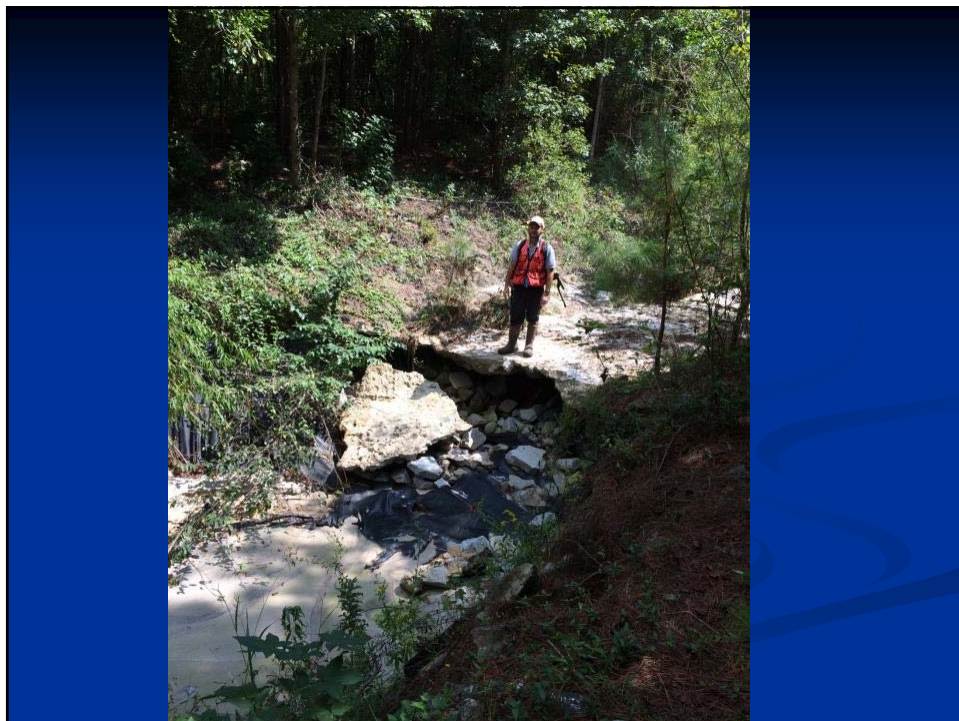


**WK DICKSON**  
community infrastructure consultants

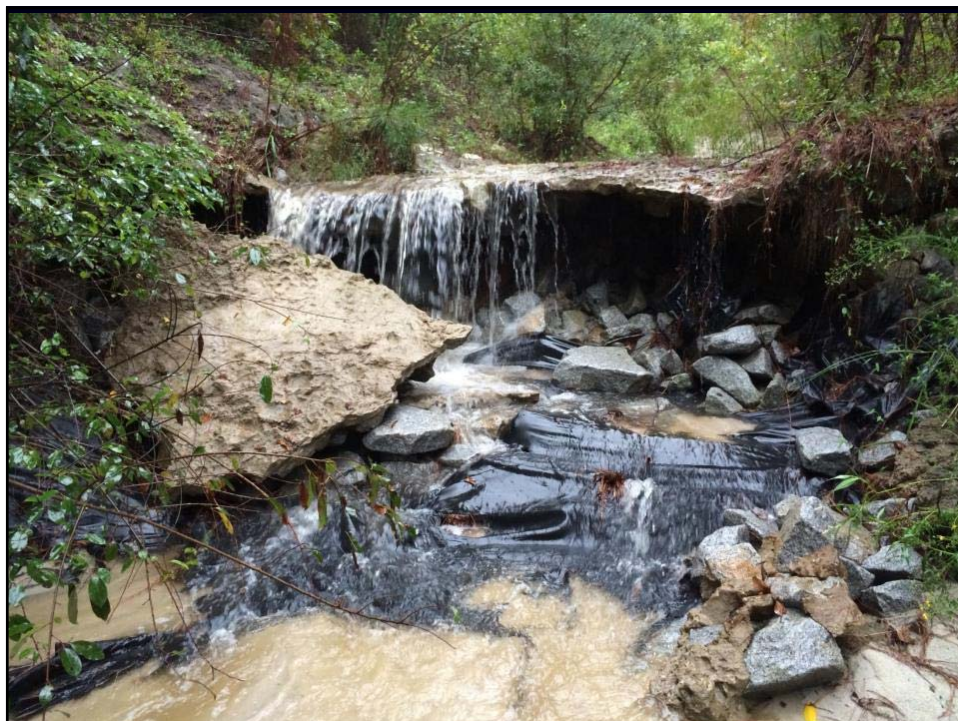












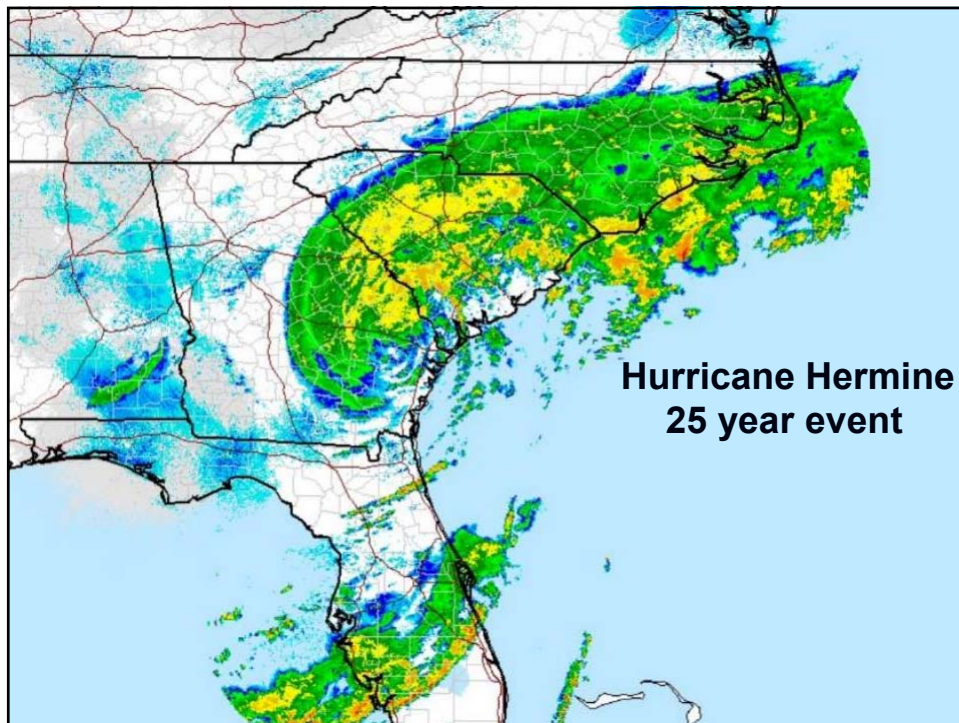
























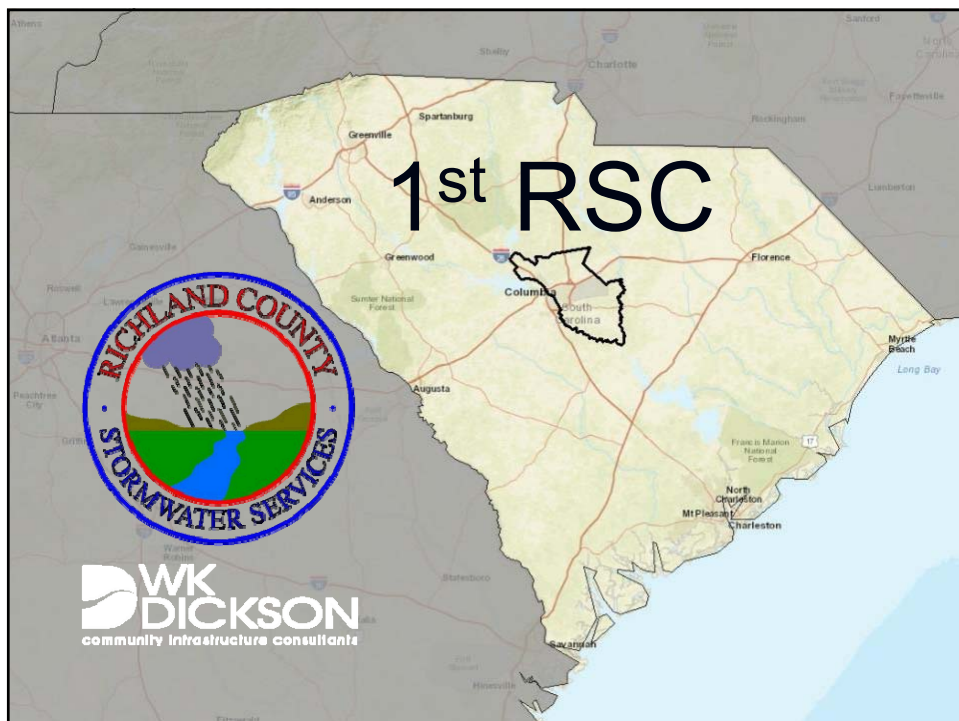




## Monitoring



# Monitoring



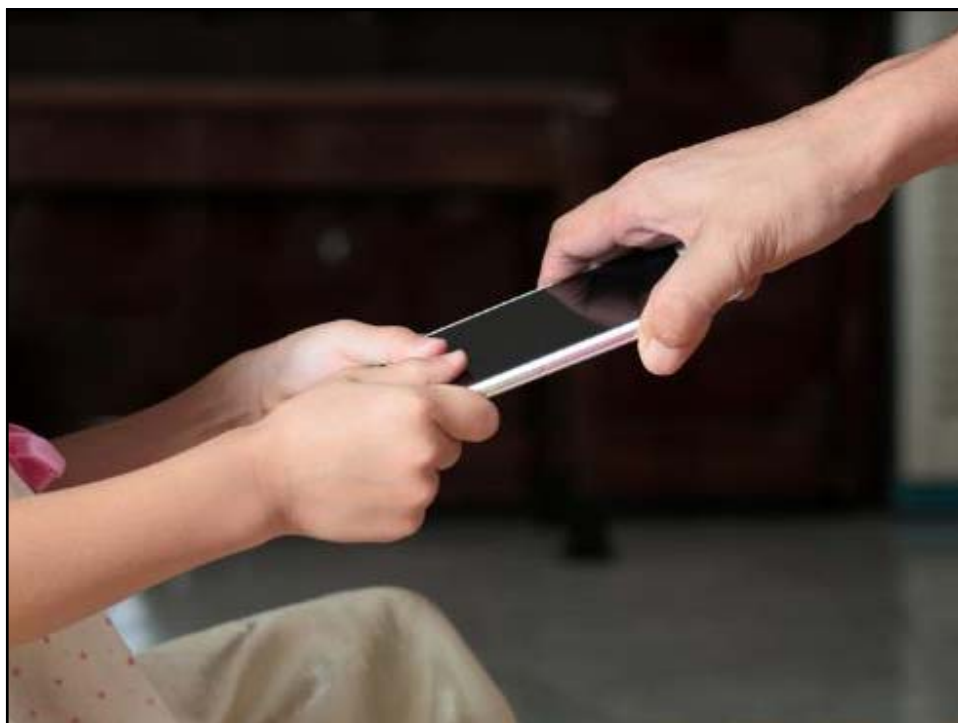


## ACEC Engineering Excellence Award



+3,500'







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WARNING!  
SHAMELESS PLUG





