NORTH CAROLINA
Department of Transportation

E&SC Design Considerations for Linear Construction

Jeremy Goodwin

December 4, 2018

E&SC Design

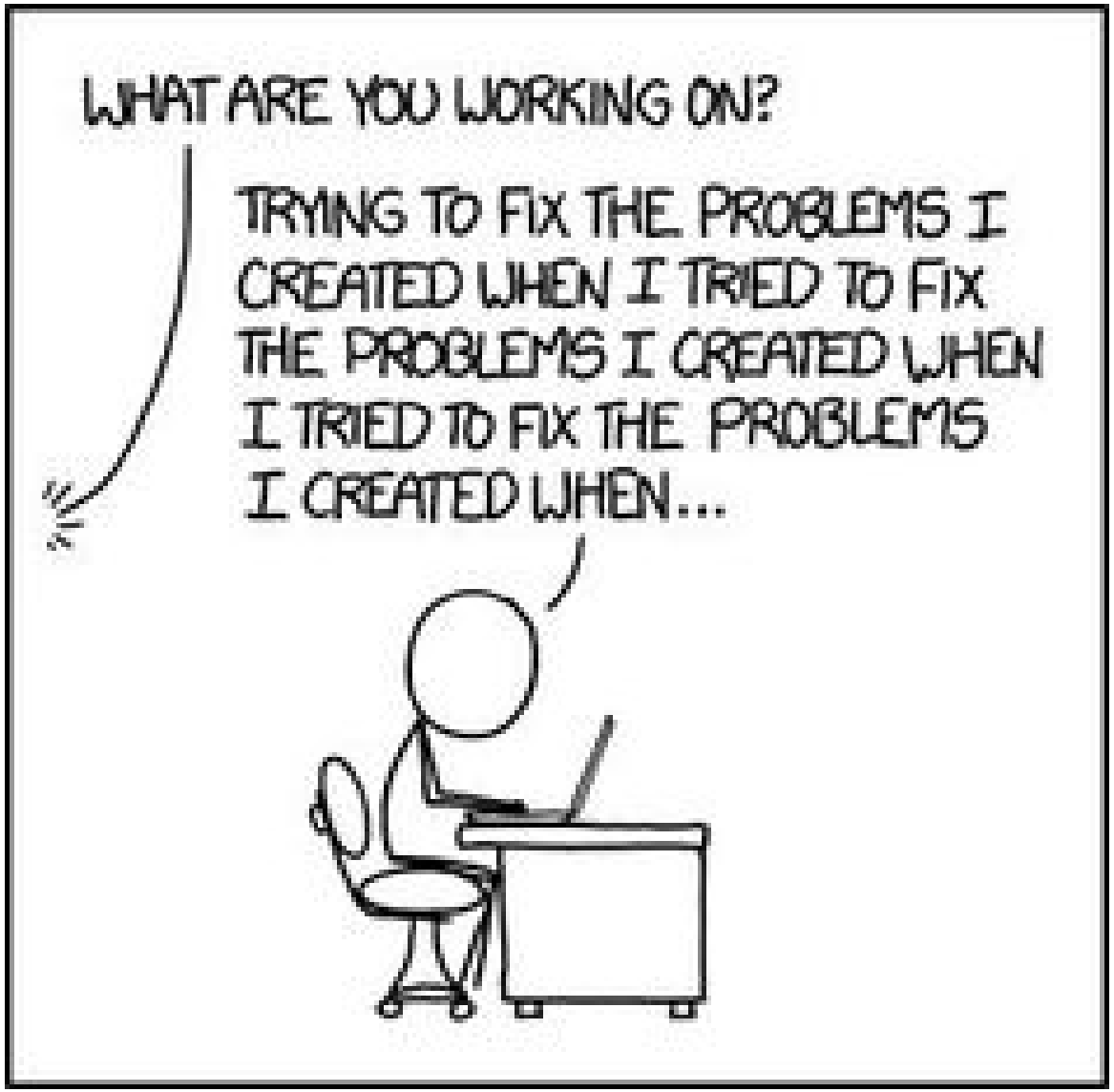
- Minimizing Erosion
  - Reducing stormwater runoff
  - Minimizing exposed soils
- Reducing Sediment Loads
  - StormwateVelocity Control
  - r Detention
  - Flocculation

E&SC Plan Design

- Runoff management during construction

Constructability

- If it’s drawn on the plan sheet its constructible….
- E&SC constructability is giving the means and methods to manage stormwater runoff during construction operations



Clean Water Diversion

- Carry offsite drainage around the project limits
- Runoff diversion around linear construction can be difficult

Clean Water Diversion

- Maintaining offsite drainage through the project may be even more difficult
- What to do when CWD must cross grade

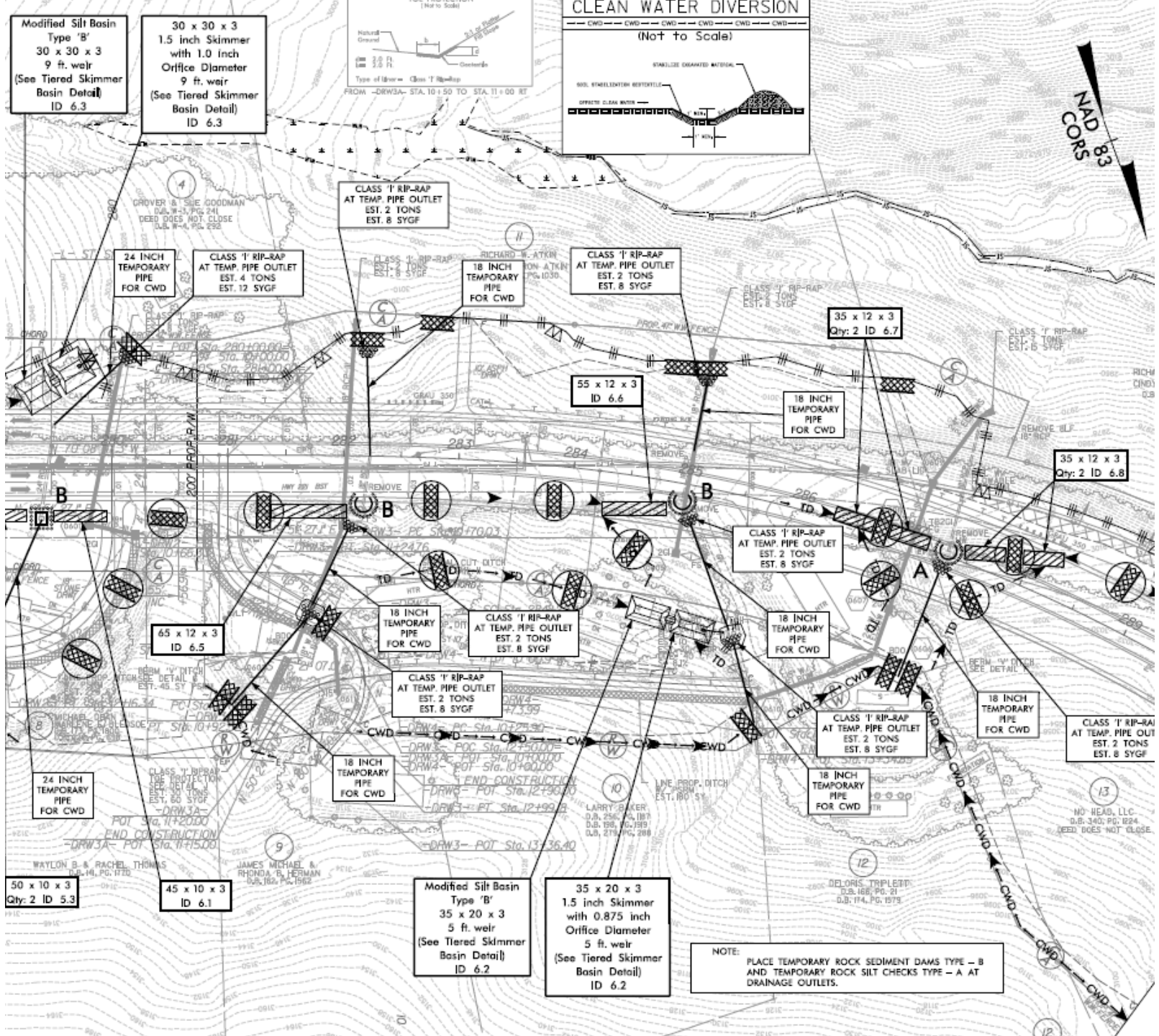
Treat it like a jurisdictional stream

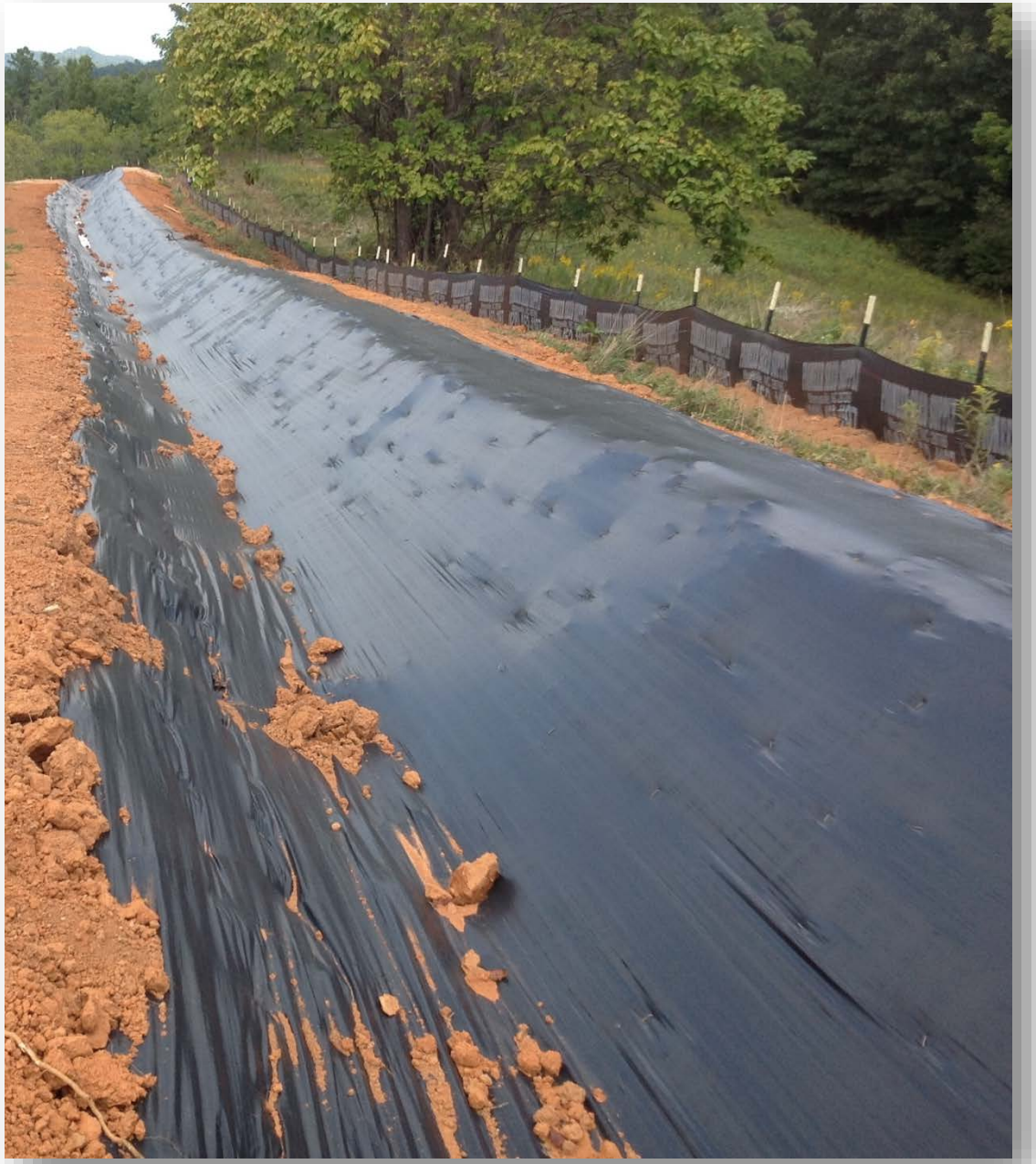
Clean Water Diversion

- Piping offsite water through project
  - Temporary pipe located outside project limits at collection point
  - Discharge outside of project limits at a stabilized receiving point
  - Pipes may have traffic crossing them

Clean Water Diversion

- Conveying drainage from existing pipe outfalls can also be problematic


CLEAN WATER DIVERSION
(Not to Scale)
Modified Silt Basin Type 'B' 30 x 30 x 3 9 ft. weir (See Tiered Skimmer Basin Detail) ID 6.3
30 x 30 x 3 1.5 inch Skimmer with 1.0 inch Orifice Diameter 9 ft. weir (See Tiered Skimmer Basin Detail) ID 6.3
CLASS 'I' RIP-RAP AT TEMP. PIPE OUTLET EST. 2 TONS EST. 8 SYGF
24 INCH TEMPORARY PIPE FOR CWD
CLASS 'I' RIP-RAP AT TEMP. PIPE OUTLET EST. 4 TONS EST. 12 SYGF
18 INCH TEMPORARY PIPE FOR CWD
CLASS 'I' RIP-RAP AT TEMP. PIPE OUTLET EST. 2 TONS EST. 8 SYGF
35 x 12 x 3 Qty: 2 ID 6.7
55 x 12 x 3 ID 6.6
18 INCH TEMPORARY PIPE FOR CWD
35 x 12 x 3 Qty: 2 ID 6.8
CLASS 'I' RIP-RAP AT TEMP. PIPE OUTLET EST. 2 TONS EST. 8 SYGF
18 INCH TEMPORARY PIPE FOR CWD
CLASS 'I' RIP-RAP AT TEMP. PIPE OUTLET EST. 2 TONS EST. 8 SYGF
65 x 12 x 3 ID 6.5
CLASS 'I' RIP-RAP AT TEMP. PIPE OUTLET EST. 2 TONS EST. 8 SYGF
18 INCH TEMPORARY PIPE FOR CWD
CLASS 'I' RIP-RAP AT TEMP. PIPE OUTLET EST. 2 TONS EST. 8 SYGF
18 INCH TEMPORARY PIPE FOR CWD
24 INCH TEMPORARY PIPE FOR CWD
18 INCH TEMPORARY PIPE FOR CWD
18 INCH TEMPORARY PIPE FOR CWD
50 x 10 x 3 Qty: 2 ID 5.3
45 x 10 x 3 ID 6.1
Modified Silt Basin Type 'B' 35 x 20 x 3 5 ft. weir (See Tiered Skimmer Basin Detail) ID 6.2
35 x 20 x 3 1.5 inch Skimmer with 0.875 inch Orifice Diameter 5 ft. weir (See Tiered Skimmer Basin Detail) ID 6.2
NOTE: PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.
NAD 83 CORS



Temporary Stream Diversions for Culvert Construction

Stream Channel Diversions

- Temporary Channel around the work site

Stream Channel Diversions

- Utilize existing barrels or stage the barrel construction

Stream Channel Diversions

Temporary Pipe

Stream Channel Diversions

- Bypass Pumping

Impervious Dike

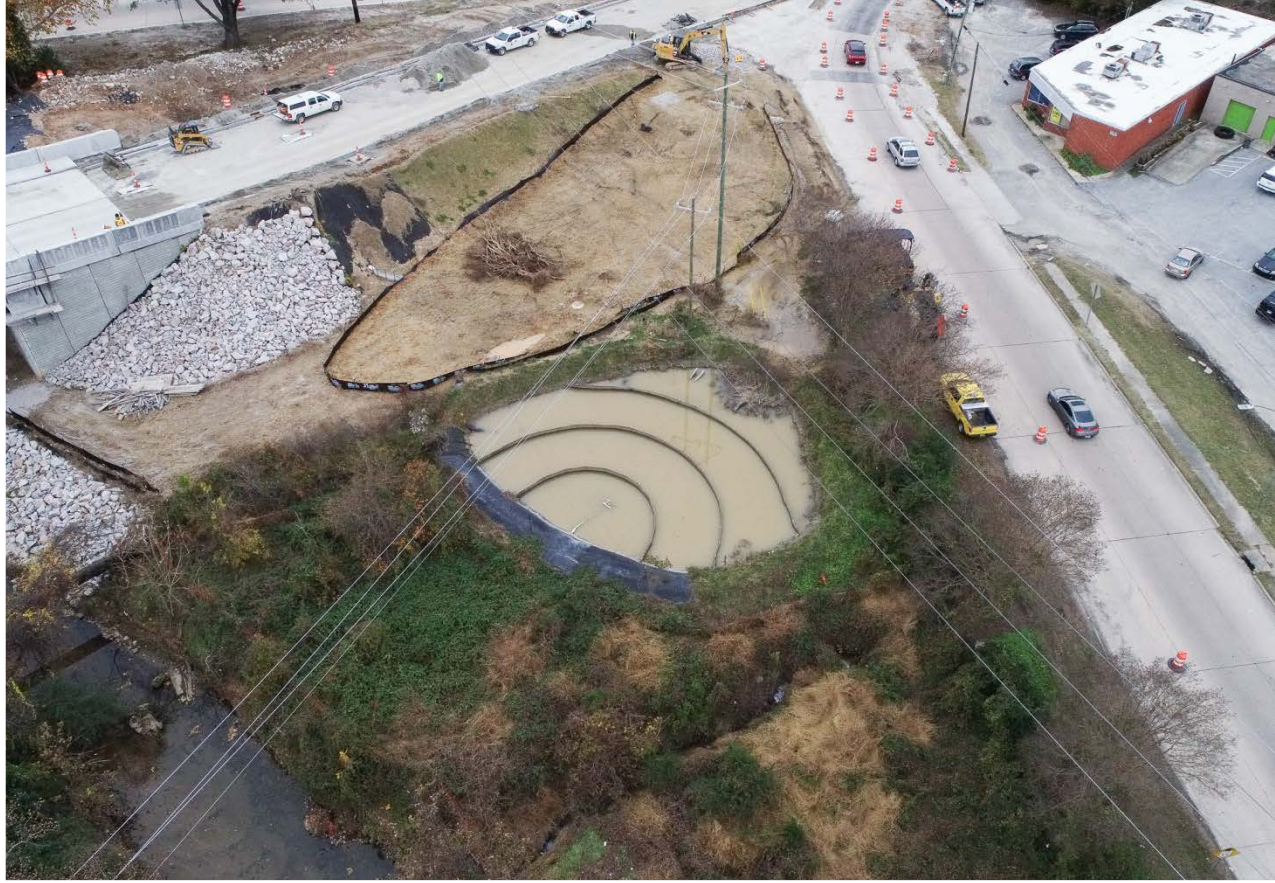
Turbidity Curtain

- Should be used at jurisdictional water bodies

Deese Rd
Deese Rd
Deese Rd
Deese Rd
Deese Rd
3D

Sediment Control Basins

- Topography issues



Sediment Control Basins

Porous baffle design

Sediment Control Basins

- Access issues for maintenance

Sediment Control Basins

- Cleanout/maintenance issues

What equipment is available for maintenance

Sediment Control Basins

- Stabilized outlet/undisturbed area

E&SC Devices & Utilities

- Aerial & underground
- Timing of utility relocation

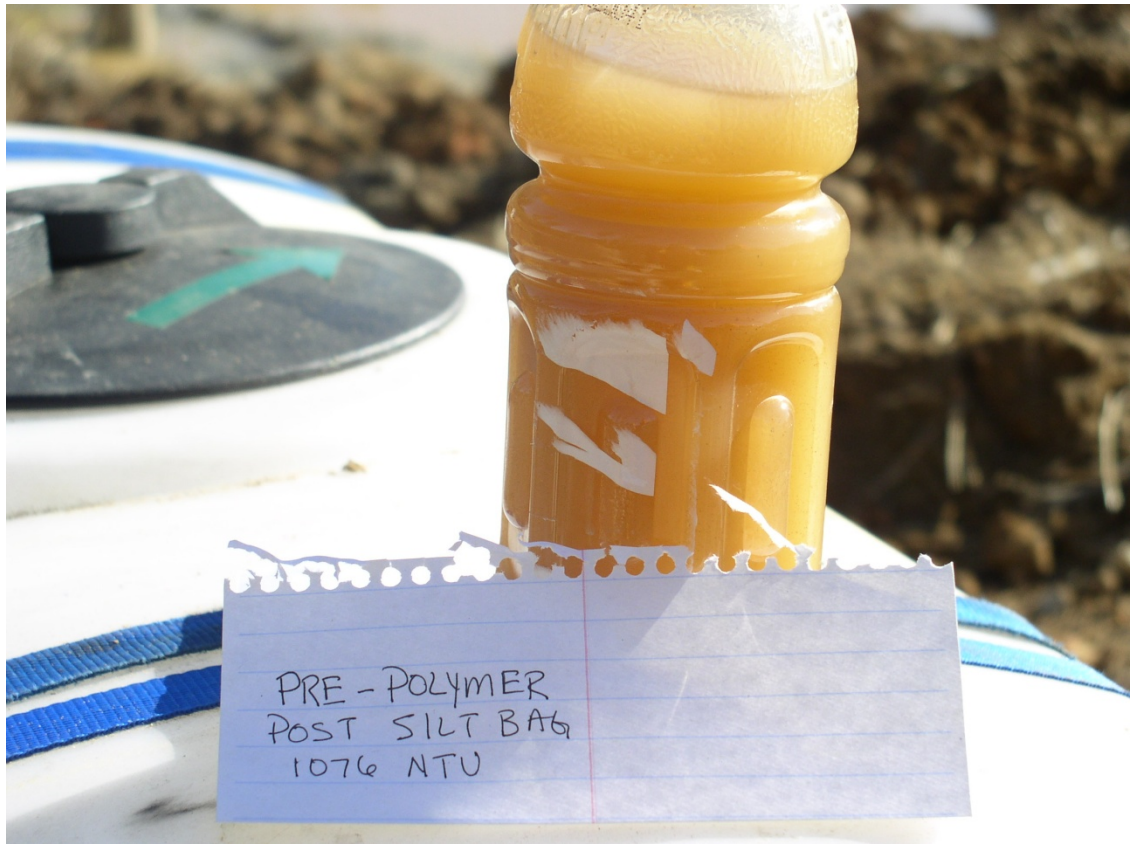
Site Visits

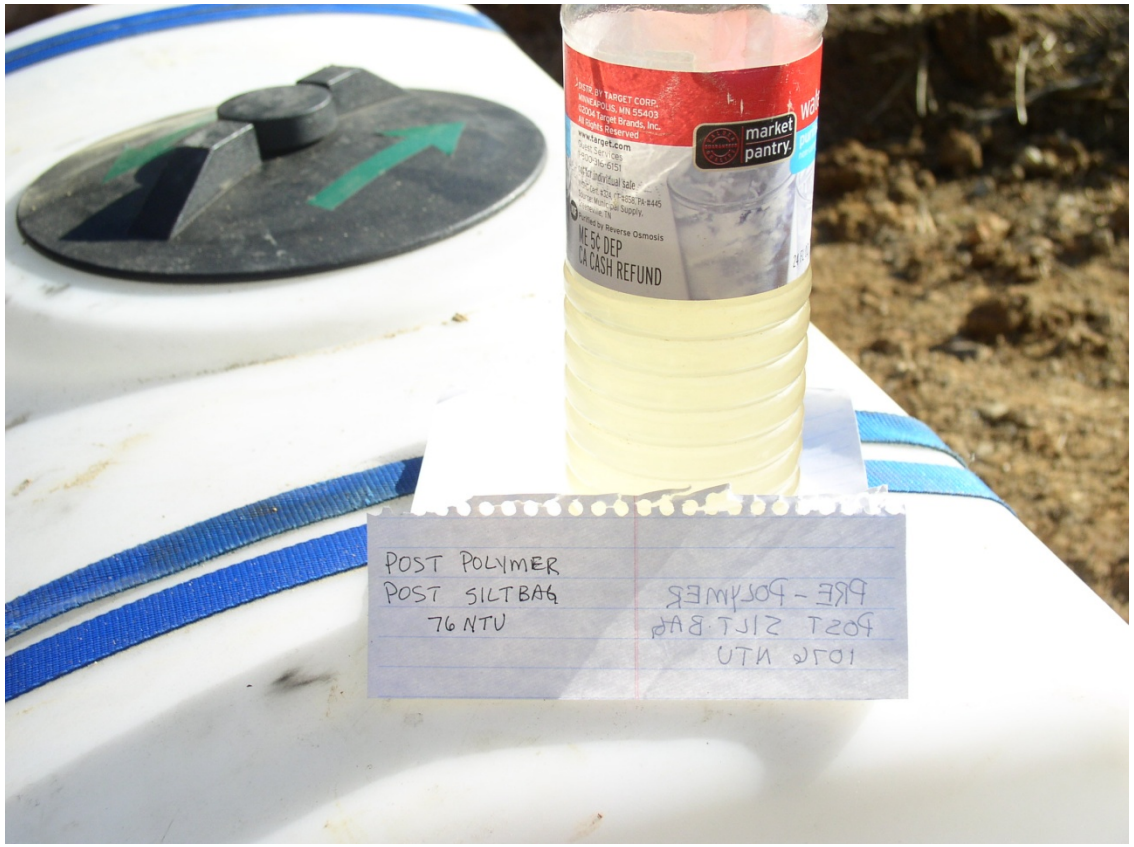
- Back in the old days…

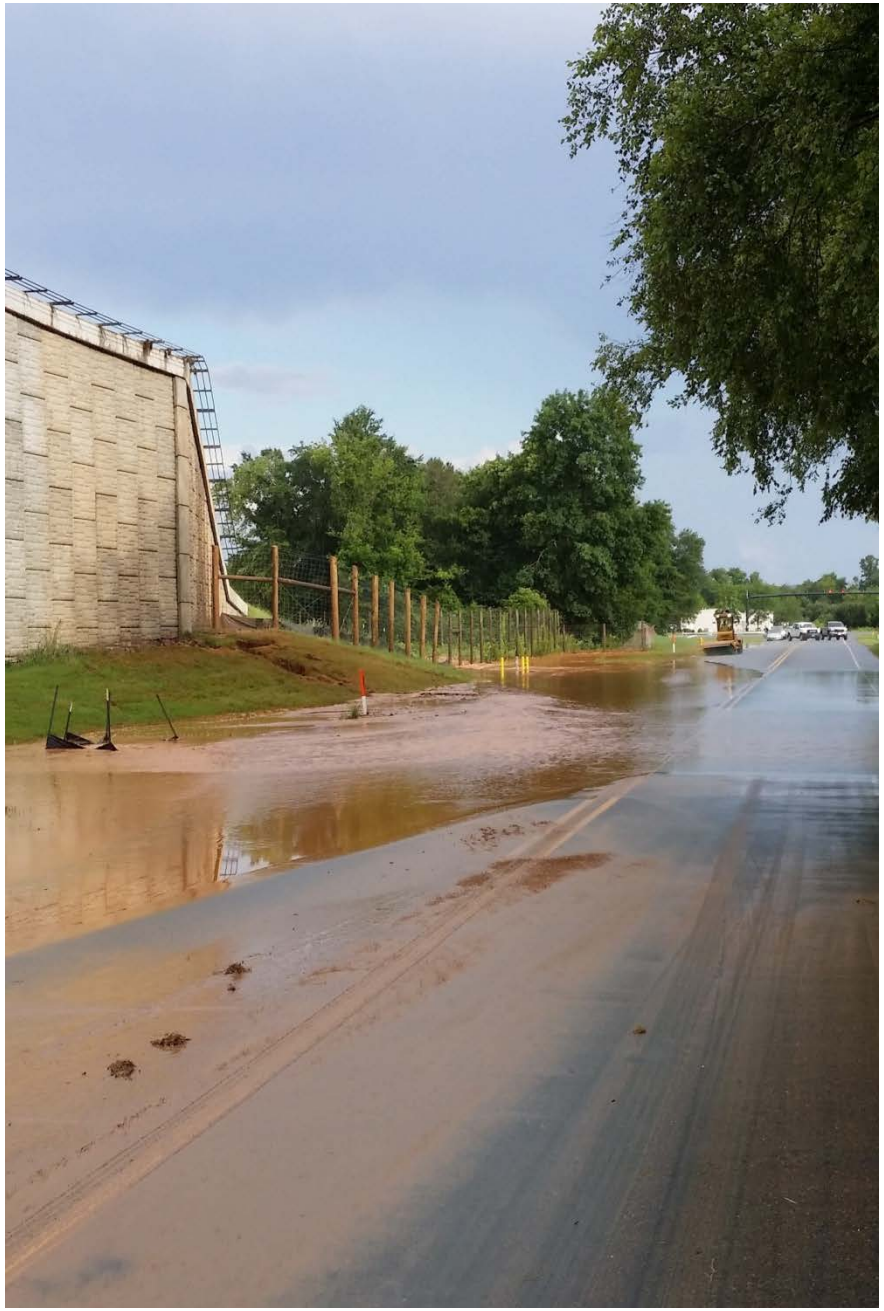
R-3825B

10-24-2018

Flocculants







Inlet Protection Issues

Ditch Liners

Concrete Washouts

NCDOT Roadside Environmental Unit

- Main Web Page
  - https://www.ncdot.gov/initiatives-policies/environmental/Pages/default.aspx

- Roadside Environmental SharePoint Connect Site
  - https://connect.ncdot.gov/resources/roadside/Pages/default.aspx