

Stream and Wetland Mitigation in North Carolina:

An Overview and Erosion and Sediment Control Practices

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WILDLANDS
ENGINEERING

Presentation Overview

An Overview of Mitigation

- Why is mitigation needed
- Types of mitigation
- NC DMS and Full Delivery Mitigation

Erosion and Sediment Control for Mitigation

- Planning
- Practices used

Project Examples



Experience and Expertise

In the past **14 years**, Wildlands Engineering has completed the following:

1,405,900 LF
of stream
assessed

609,800 LF
of stream
constructed

796,700 LF
of stream
designed

698 acres
of wetland
assessed

665 acres
of wetland
designed

Construction
oversight on
577 acres
of wetland

Owners or
managers of
79 major,
active
mitigation
projects

History of Stream Degradation



Why Restore Streams?

- Improve water quality/reduce sediment
- Flood storage
- Improve aquatic and riparian habitat
- Recreational open space
- Education
- Long term economics
- Aesthetics



History of Wetland Degradation



Why Restore Wetlands?

- Flood control
- Nutrient retention or removal
- Erosion control
- Water quality maintenance
- Carbon storage
- Wildlife habitat



Mitigation in North Carolina

- **Stream Mitigation** – Section 404 of CWA, Compensatory Mitigation for Losses of Aquatic Resources; Final Rule.
- **Wetland Mitigation** – Section 404 of CWA, Compensatory Mitigation for Losses of Aquatic Resources; Final Rule.
- **Riparian Buffer Mitigation** – State Consolidated Buffer Rules (Certain river basins only)
- **Nutrient Offset** – State Nutrient Management Strategy (Certain river basins only)

Mitigation in North Carolina

When is mitigation required?

- Impacts equal to or exceeding 300 linear feet of streams
- Impacts equal to or exceeding 0.10 acre of wetlands
- Individual thresholds depending on impact type for buffers

Types of Mitigation Available

- **Permittee Responsible Mitigation (PRM)** – Permittee performs mitigation activities themselves, at project site or off-site
- **Private Bank** – Applicant buys credits from an approved mitigation bank
- **Fee In-Lieu** – Applicant buys credits from **N.C. Division of Mitigation Services (DMS)**

DMS History

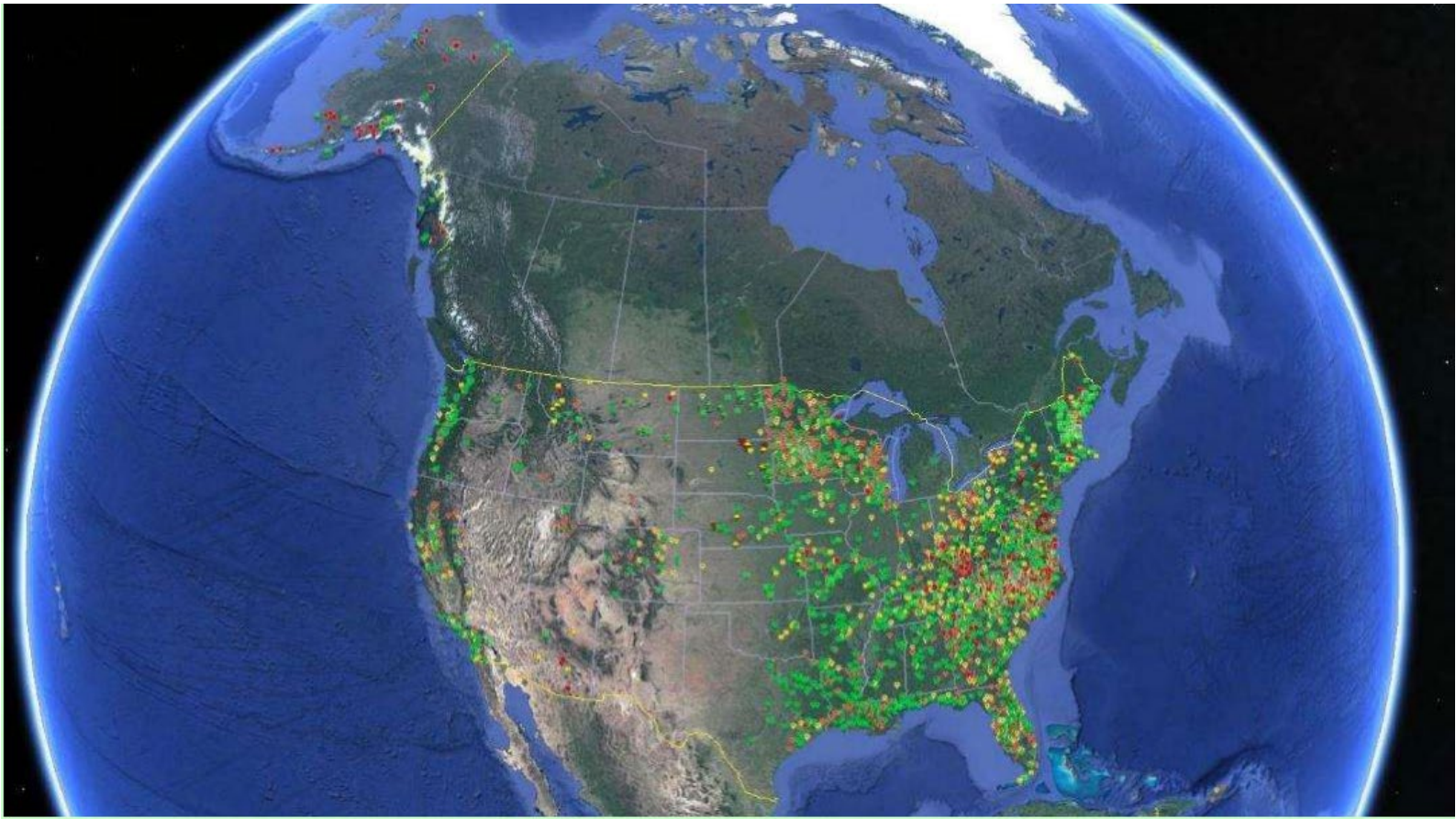


- Established in 1997
- Funds and programs:
 - NCDOT Stream & Wetland ILF
 - Statewide Stream & Wetland ILF
 - Riparian Buffer ILF
 - Nutrient Offset ILF
- 649 projects; 200 active at any time
- 2.7 million stream credits (>757 miles)
- >12,000 wetland credits (>29,000 acres)
- 2,430 acres of buffer and nutrient offset



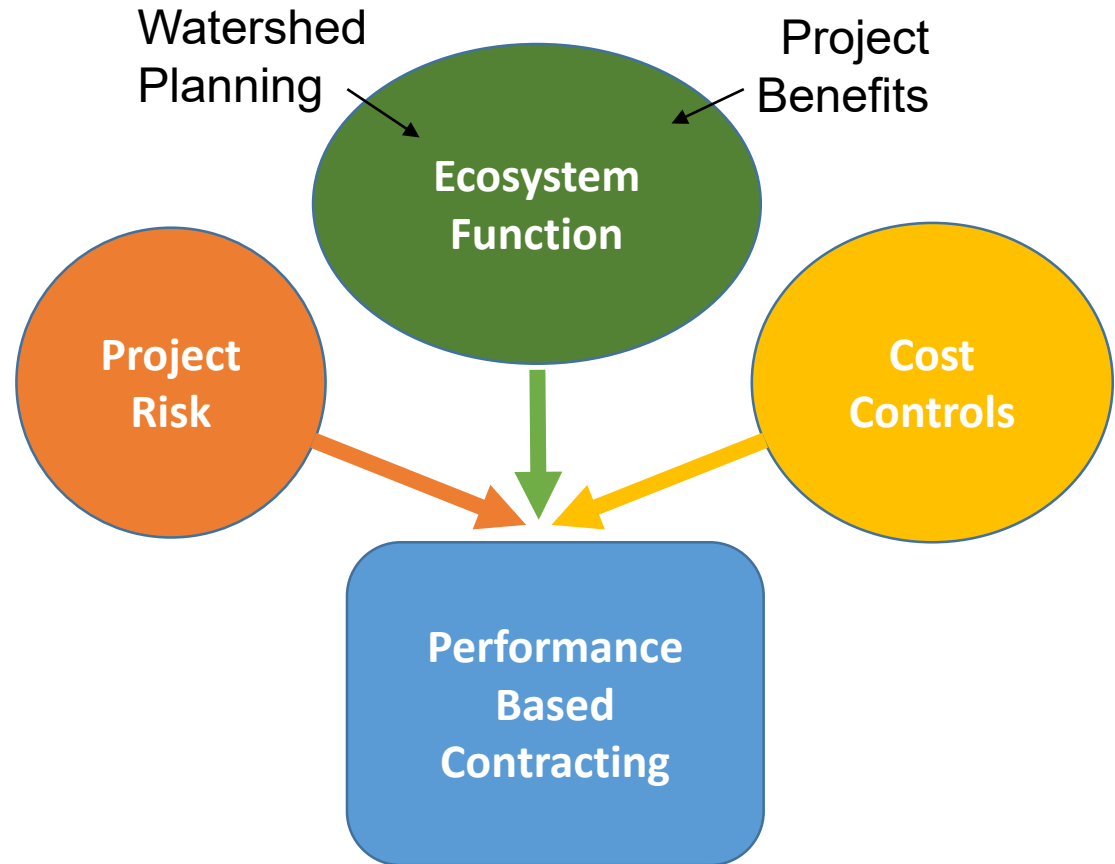
Compensatory Mitigation





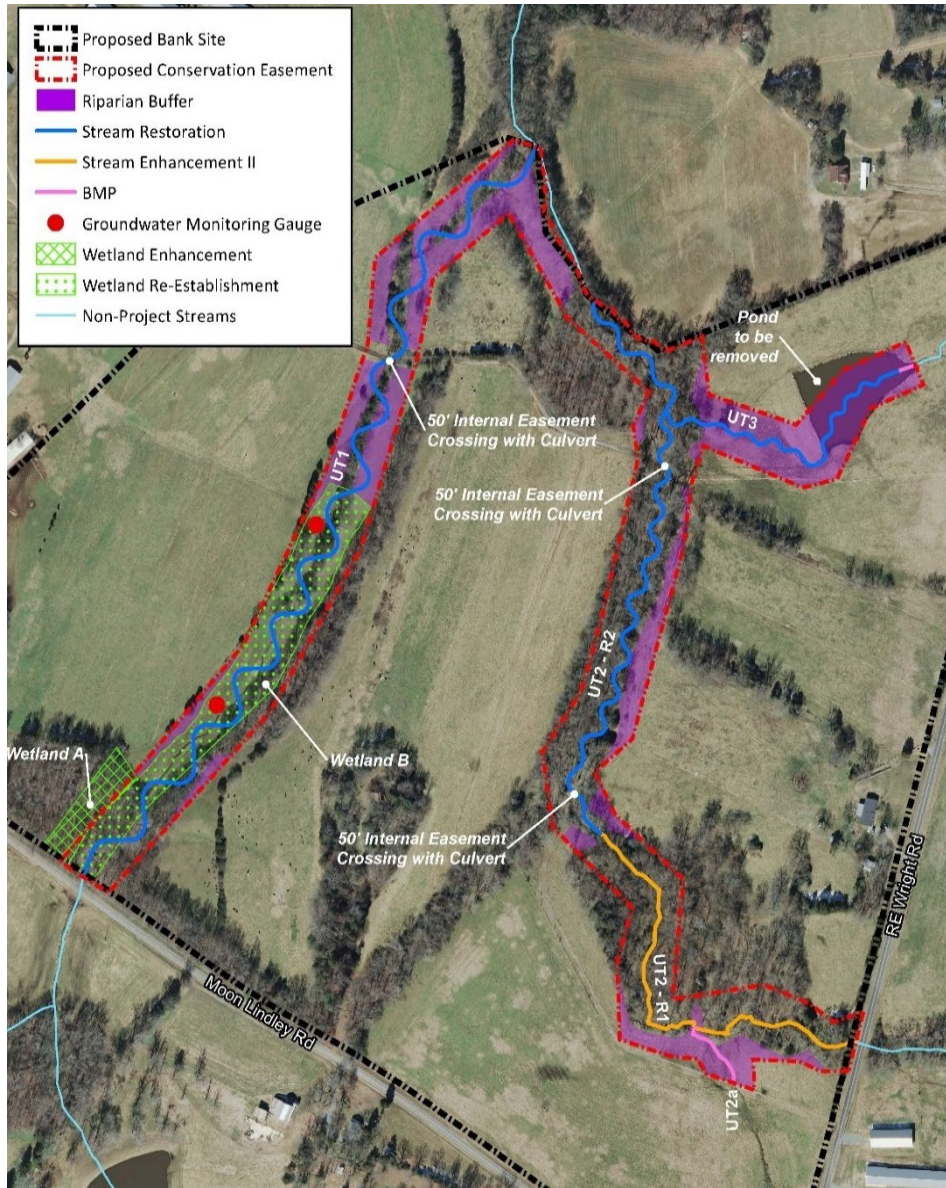
Procurement Strategy

- Full Delivery Model
- Watershed Planning
- Project evaluation
- Performance-based outcomes

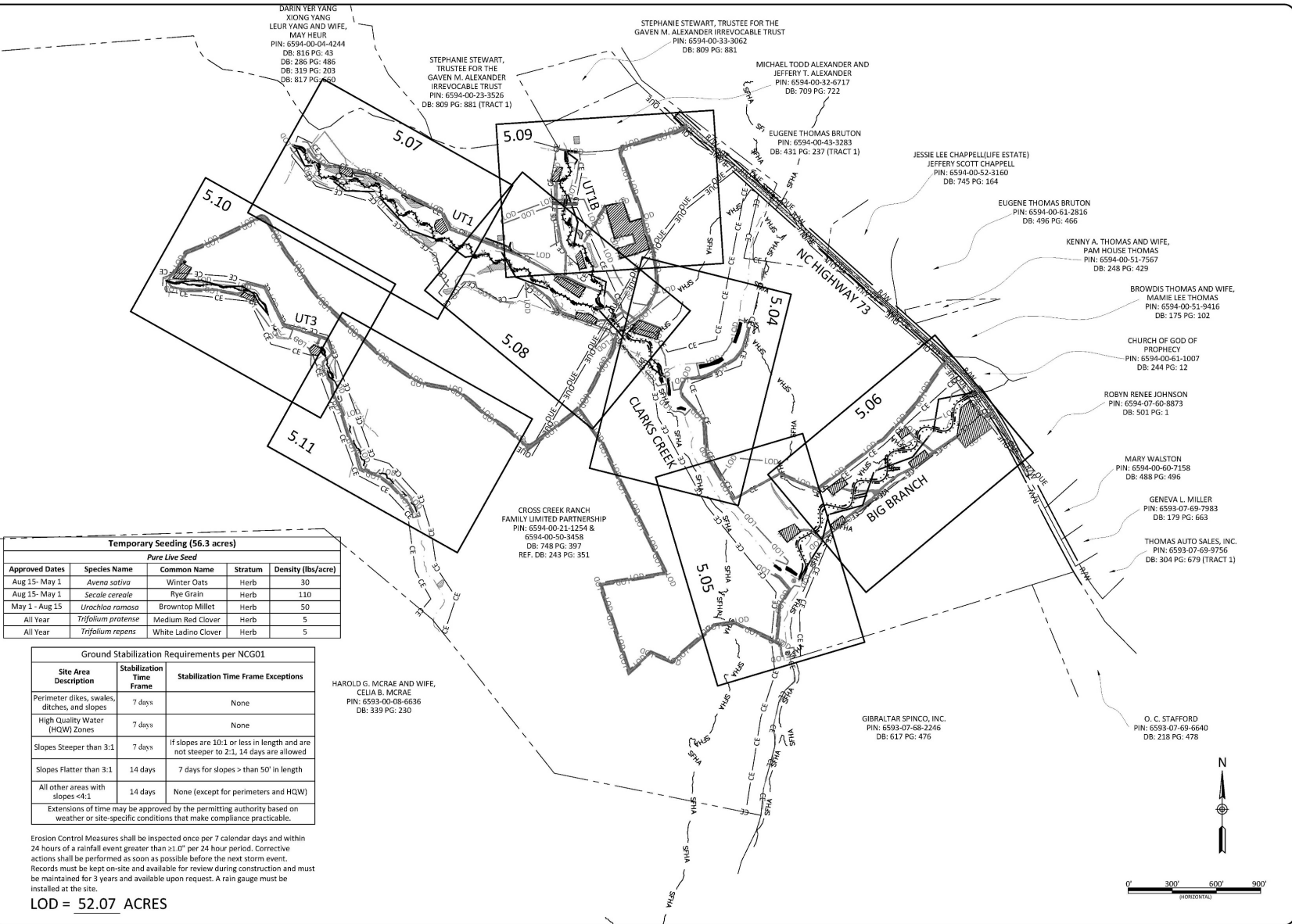


Typical Mitigation Project

- Stream restoration/enhancement
- Wetland mitigation
- Riparian buffer restoration/enhancement
- Pond/dam removal
- Agricultural/stormwater BMPs
- Conservation Easement



July 25, 2021
 X:\Mount Pleasant\Watershed\Cross Creek Ranch\CAD\Drawings\5.01 Erosion Control Plan.dwg



Temporary Seeding (56.3 acres)

Pure Live Seed				
Approved Dates	Species Name	Common Name	Stratum	Density (lbs/acre)
Aug 15- May 1	<i>Avena sativa</i>	Winter Oats	Herb	30
Aug 15- May 1	<i>Secale cereale</i>	Rye Grain	Herb	110
May 1 - Aug 15	<i>Urochloa ramosa</i>	Browntop Millet	Herb	50
All Year	<i>Trifolium pratense</i>	Medium Red Clover	Herb	5
All Year	<i>Trifolium repens</i>	White Ladino Clover	Herb	5

Ground Stabilization Requirements per NCG01

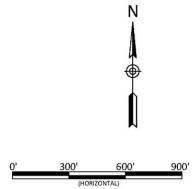
Site Area Description	Stabilization Time Frame	Stabilization Time Frame Exceptions
Perimeter dikes, swales, ditches, and slopes	7 days	None
High Quality Water (HQW) Zones	7 days	None
Slopes Steeper than 3:1	7 days	If slopes are 10:1 or less in length and are not steeper to 2:1, 14 days are allowed
Slopes Flatter than 3:1	14 days	7 days for slopes > than 50' in length
All other areas with slopes <4:1	14 days	None (except for perimeters and HQW)

Extensions of time may be approved by the permitting authority based on weather or site-specific conditions that make compliance practicable.

Erosion Control Measures shall be inspected once per 7 calendar days and within 24 hours of a rainfall event greater than $\geq 1.0"$ per 24 hour period. Corrective actions shall be performed as soon as possible before the next storm event. Records must be kept on-site and available for review during construction and must be maintained for 3 years and available upon request. A rain gauge must be installed at the site.

LOD = 52.07 ACRES

- DARIN YER YANG
XIONG YANG
LEUR YANG AND WIFE,
MAY HEUR
PIN: 6594-00-04-4244
DB: 816 PG: 43
DB: 286 PG: 486
DB: 319 PG: 203
DB: 817 PG: 660
- STEPHANIE STEWART,
TRUSTEE FOR THE
GAVIN M. ALEXANDER
IRREVOCABLE TRUST
PIN: 6594-00-23-3526
DB: 809 PG: 881 (TRACT 1)
- STEPHANIE STEWART, TRUSTEE FOR THE
GAVEN M. ALEXANDER IRREVOCABLE TRUST
PIN: 6594-00-33-3062
DB: 809 PG: 881
- MICHAEL TODD ALEXANDER AND
JEFFERY T. ALEXANDER
PIN: 6594-00-32-6717
DB: 709 PG: 722
- EUGENE THOMAS BRUTON
PIN: 6594-00-43-3283
DB: 433 PG: 237 (TRACT 1)
- JESSIE LEE CHAPPELL/LIFE ESTATE)
JEFFERY SCOTT CHAPPELL
PIN: 6594-00-52-3160
DB: 745 PG: 164
- EUGENE THOMAS BRUTON
PIN: 6594-00-61-2816
DB: 496 PG: 466
- KENNY A. THOMAS AND WIFE,
PAM HOUSE THOMAS
PIN: 6594-00-51-7567
DB: 248 PG: 429
- BROWDIS THOMAS AND WIFE,
MAMIE LEE THOMAS
PIN: 6594-00-51-9416
DB: 175 PG: 102
- CHURCH OF GOD OF
PROPHECY
PIN: 6594-00-61-1007
DB: 244 PG: 12
- ROBYN RENEE JOHNSON
PIN: 6594-07-50-8873
DB: 501 PG: 1
- MARY WALSTON
PIN: 6594-00-60-7158
DB: 488 PG: 496
- GENEVA L. MILLER
PIN: 6593-07-69-7983
DB: 179 PG: 663
- THOMAS AUTO SALES, INC.
PIN: 6593-07-69-9756
DB: 304 PG: 679 (TRACT 1)
- O. C. STAFFORD
PIN: 6593-07-69-6640
DB: 218 PG: 478
- GIBRALTAR SPINCO, INC.
PIN: 6593-07-68-2246
DB: 617 PG: 476
- HAROLD G. MCRAE AND WIFE,
CELIA B. MCRAE
PIN: 6593-00-08-6636
DB: 339 PG: 230
- CROSS CREEK RANCH
FAMILY LIMITED PARTNERSHIP
PIN: 6594-00-21-1254 &
6594-00-50-3458
DB: 748 PG: 397
REF. DB: 243 PG: 351



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Civil/Structural

Cross Creek Ranch Mitigation Site
Montgomery County, North Carolina

Overview
Erosion and Sediment Control Plan

Drawn: CE 20/2021
Scale: 1"=50'
Date: 05/20/21
Project: 2021-001
Client: NAKS
Drawn By: NAKS

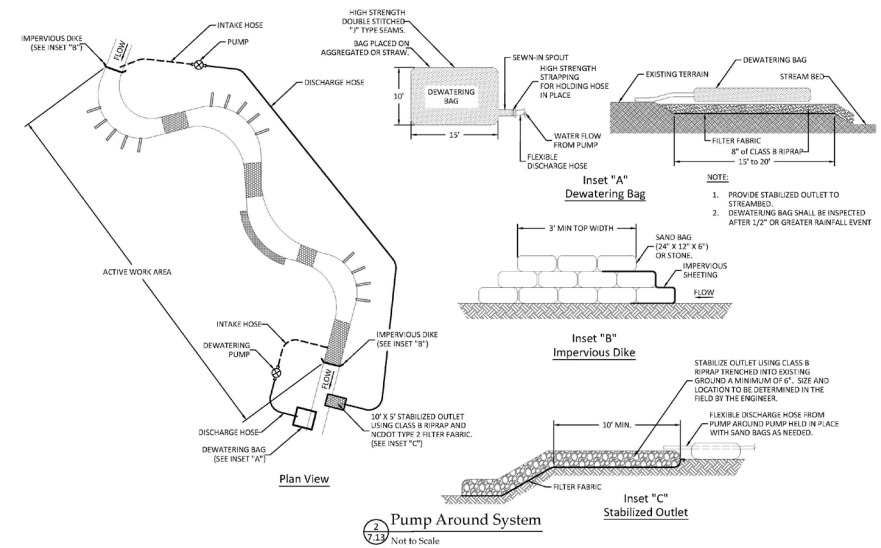
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Erosion and Sedimentation Controls



Erosion and Sedimentation Controls



Erosion and Sedimentation Controls



Completed Projects



Completed Projects – Big Harris Creek



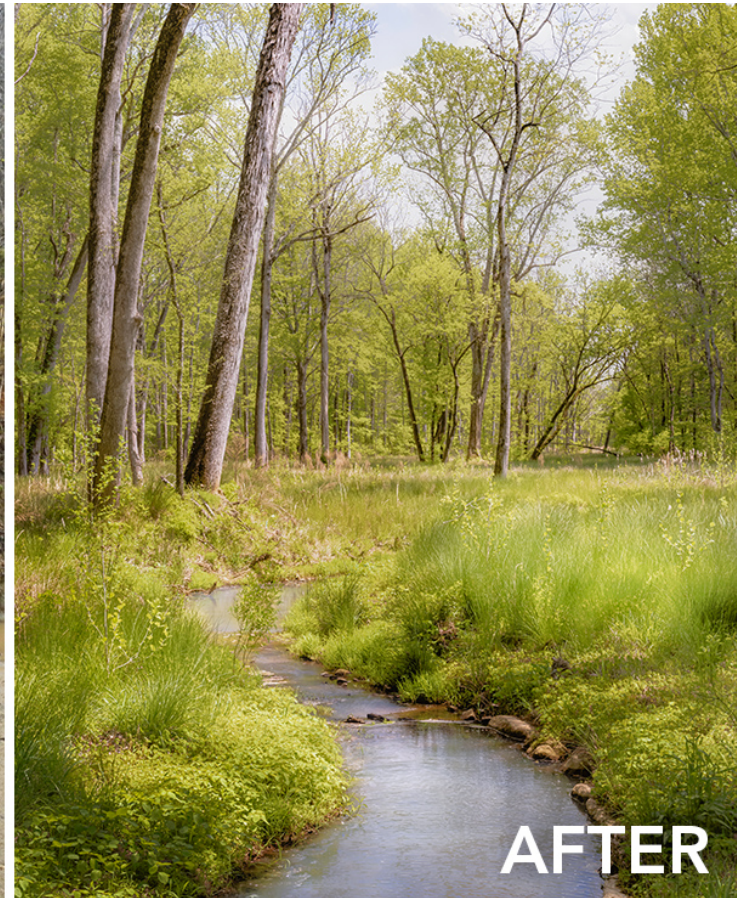
Completed Projects – Little Troublesome Creek



Completed Projects – Marylea Farms



Completed Projects – Reedy Creek



Completed Projects – Vile Creek



Questions?



Please Remember to Complete the End of Workshop Evaluation



<https://bit.ly/2021EscEval>

