

CHARLOTTE-MECKLENBURG CERTIFIED SITE INSPECTOR TRAINING COURSE



Sponsored by
City of Charlotte Land Development Division
Charlotte-Mecklenburg Storm Water Services
Mecklenburg County Water Quality Program



Charlotte-Mecklenburg Certified Site Inspector (CMCSI) Training Agenda

(Please turn off all cell phones and pagers!)

- 8:00 – 8:30 Registration
- 8:30 – 9:30 **Impacts of Sediment and Turbidity on Water Quality**
Rusty Rozzelle, Mecklenburg County Water Quality Manager
- 9:30 – 10:00 **Rules and Regulations**
Jeff Bock, CPESC-IT, City of Charlotte
- 10:00 – 10:20 Break
- 10:20 – 10:50 **Soil Erosion and Sedimentation Process**
Jason Klingler, Mecklenburg County
- 10:50 – 11:20 **Vegetation Plans**
Heather Davis, Mecklenburg County
- 11:20 – 11:40 **Creek Crossings**
Corey Priddy, Mecklenburg County Team Leader
- 11:40 – 12:00 **Stream Restoration: A Case Study in Gaston County**
Michael Burkhard, NCDENR DWQ with Catherine Daly, UNCC
- 12:00 – 12:45 LUNCH
- 12:45 – 1:45 **Installation and Maintenance of Common Erosion and Sediment Control BMPs**
Jay Wilson, CPESC, City of Charlotte
- 1:45 – 2:30 **Conducting Construction Site Inspections**
Jay Wilson
- 2:30 – 3:30 **CMCSI Examination**
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Impacts of Sediment & Turbidity on Water Quality

1. Waters of Mecklenburg County
2. Sources of Water Pollution
3. Sediment and Turbidity
4. What Can You Do To Help?

Protecting surface water quality...the right reason for soil erosion & sedimentation control.

Waters of Mecklenburg

The map shows the following watersheds: Upperville, Huntersville, Charlotte, Matthews, and Phoenixville. Inset photos show: a river with sediment, a stream with trash, a stream with algae, and a stream with a large log.

Our Most Precious Natural Resource

Recreational Uses

- Over 10 million people visit the Catawba River annually.
- Visitation is projected to increase 11% per decade through 2050.
- The Mecklenburg County greenway system is quickly becoming one of the finest in the nation.
- There are currently 37 miles of developed and 150 miles of undeveloped greenways in Mecklenburg County.

Other Lake Uses

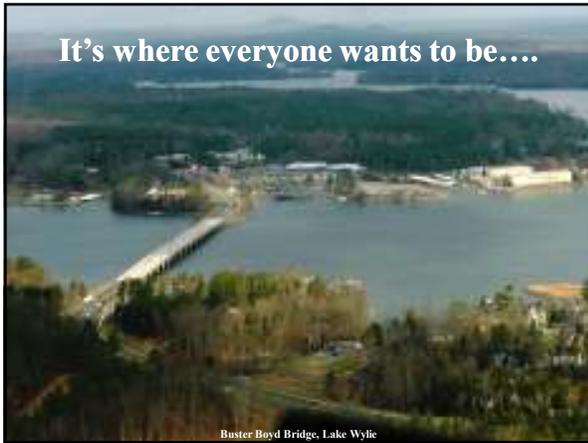


- 50% of Duke Power's capacity for electric generation relies on the Catawba River.
- This includes hydro power at the dams and cooling water at the nuclear and coal fired plants.

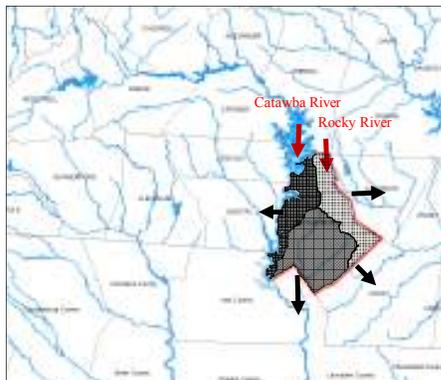


- Latta Plantation Nature Preserve is located on 1,343 acres along Mountain Island Lake.
- This area preserves the habitat for 137 species of birds, mammals, reptiles, and amphibians as well as 2 federally endangered species of plants.

It's where everyone wants to be....



We're all downstream!





Ladies fishing in Little Sugar Creek – circa 1890

Maintaining good water quality conditions in our streams and lakes is essential for maintaining our livable community.



Swimming hole in Long Creek – circa 1910



Kids wading in Little Sugar Creek – circa 2000



Historical Perspective

John Lawson, 1700
During his travels through Mecklenburg County in the early 1700s, John Lawson noted in his diary that Mecklenburg County was “abounding in many and delightful rivulets.”

From the colonial journal of John Lawson

North Carolina Collection, UNC Library, Chapel Hill



Carolina Buffalo
Grunts like a hog...



Opossum
The wonder of all land animals...



Catawba (People of the River) once considered one of the most powerful Southeastern Siouan-speaking tribes.



The Mill

- Incentives for millers included tax exemptions, freedom from military service and special protection under the law.
- By 1800, there were mills on every Mecklenburg County creek having year-round flow.
- Millers became community leaders and their mills served as popular gathering places.

First drinking water supplies in Charlotte were hand dug wells.



Independence Square in Charlotte in 1875 (intersection of Trade & Tryon). Cisterns had been built to store water in the City, one in each of the four wards.

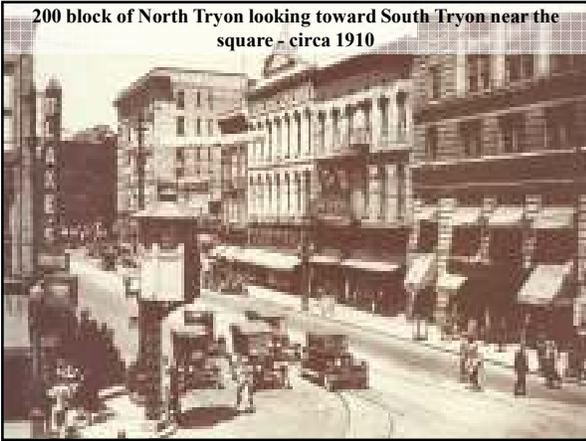




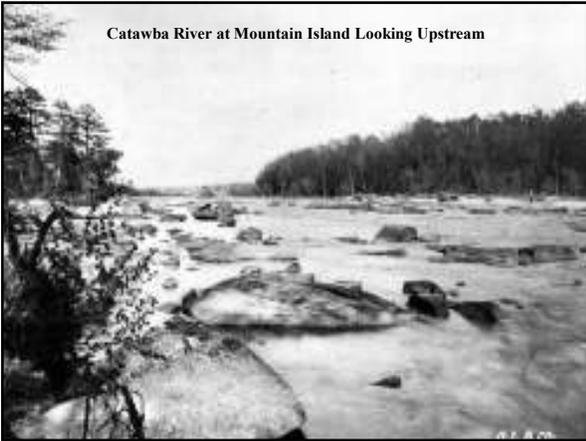
First municipal water system was built by a private company called the Charlotte Water Works Company in 1882 with the first water intake installed on Briar Creek.

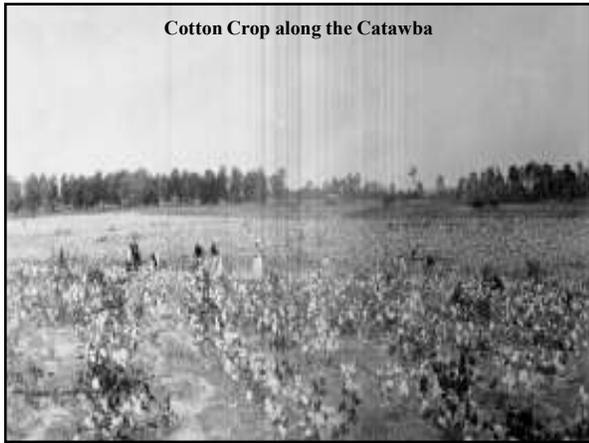


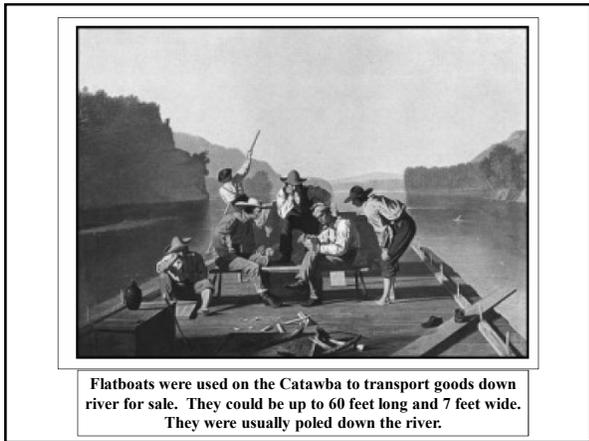
Briar Creek Pumping Station

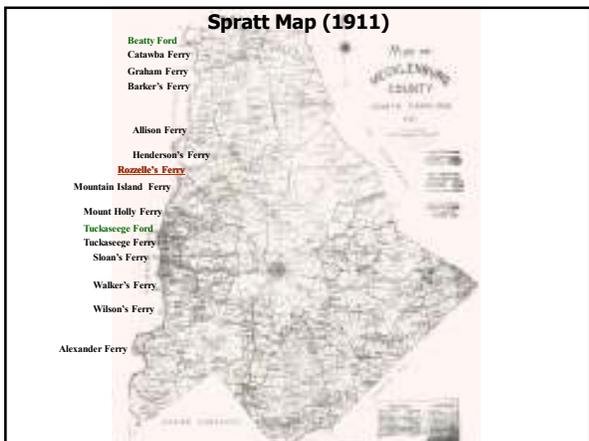




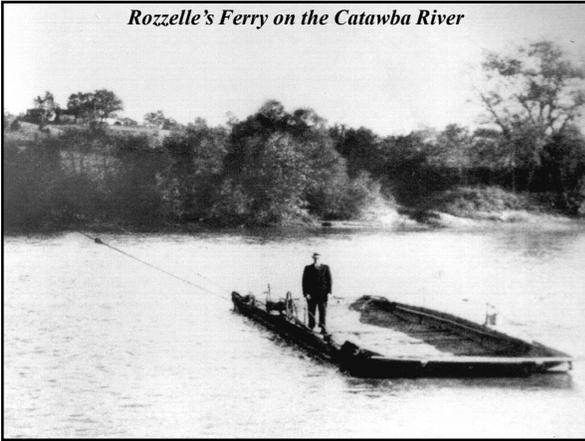


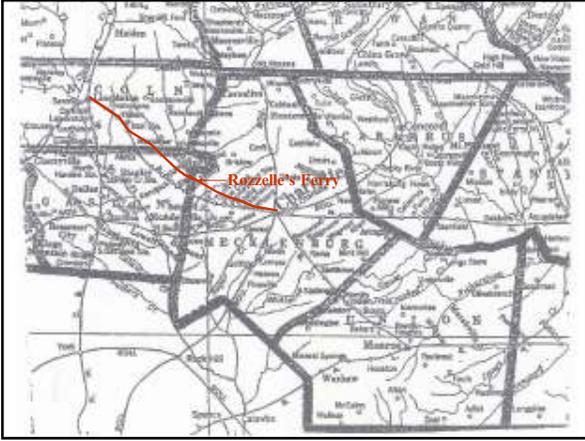






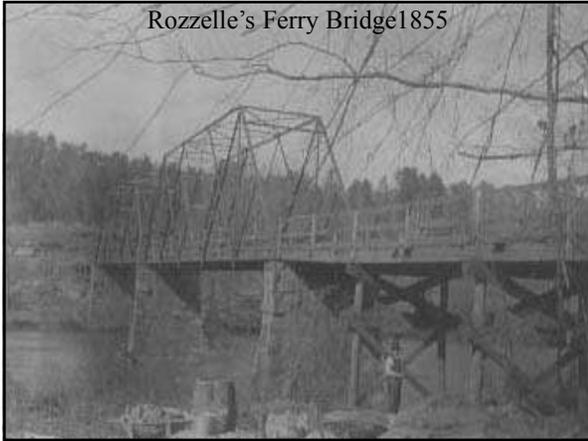
Rozzelle's Ferry on the Catawba River



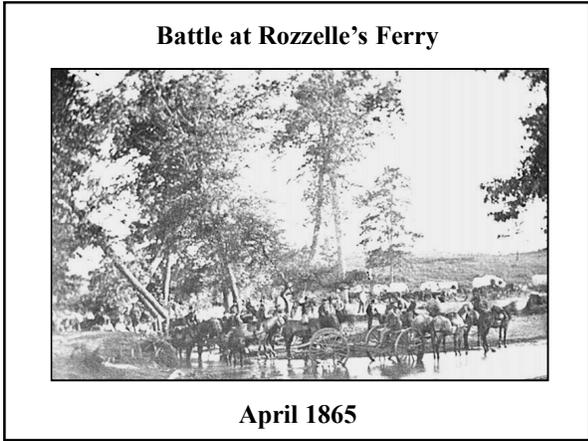


Rozzelle House - 1839



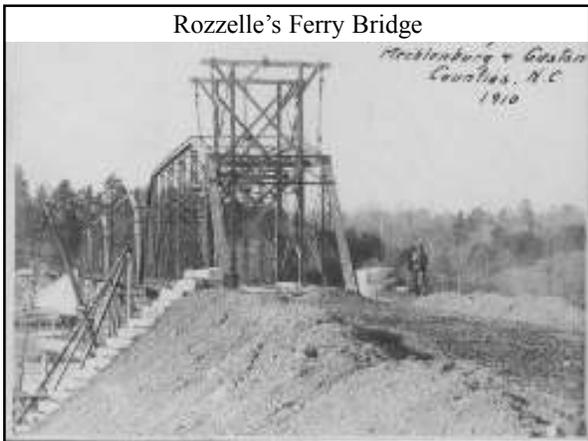


Rozzelle's Ferry Bridge 1855



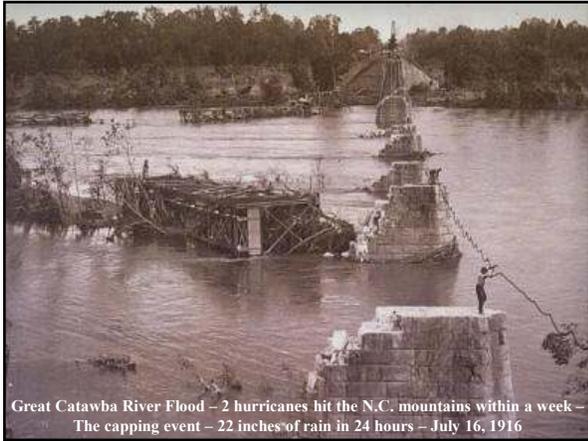
Battle at Rozzelle's Ferry

April 1865

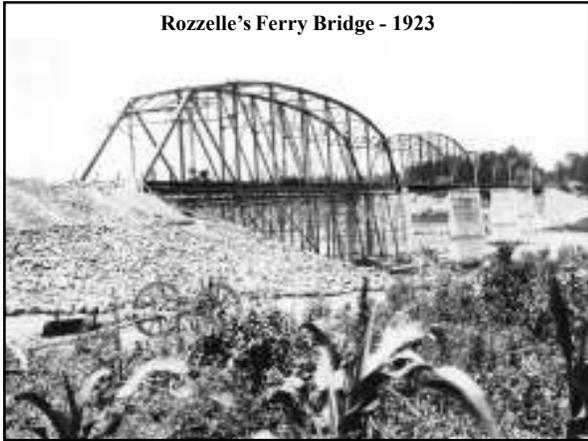


Rozzelle's Ferry Bridge

*Hicklenburg & Gaston
Counties, N.C.
1910*



Great Catawba River Flood – 2 hurricanes hit the N.C. mountains within a week –
The capping event – 22 inches of rain in 24 hours – July 16, 1916



Rozzelle's Ferry Bridge - 1923



Rozzelle's Ferry Bridge - 2012



Catawba Hydro Station (Lake Wylie) - April 1904



Construction of Mountain Island Dam - September 12, 1923

M.I. 320-9-12-23



Mountain Island Lake - 1928

*South Lake, 1928
Charlotte, N.C.*





Over the Past 40 Years in Mecklenburg County

- Population has more than doubled.
- Water supply customers have doubled.
- Amount of developed land has tripled.
- Increased pollution sources.

Charlotte Skyline 1973 (population = 354,656)

Charlotte Skyline 2013 (population = 919,628)

More People = *More Pollution*

Creek Uses Lost →

Impaired Surface Waters in Mecklenburg County

Catawba Basin	Yadkin Basin
Irwin Creek	McKee Creek
Stewart Creek	Rocky River
Taggart Creek	Clarks Creek
Coffey Creek	Crooked Creek
Kings Branch	Clear Creek
Sugar Creek	Goose Creek
Briar Creek	
Little Sugar Creek	

Water Quality Monitoring Data (77 sites)	
Miles Assessed	263
Miles Impaired	202
% Impaired	77%
Largest Impaired Stream	McAlpine Creek
Primary Source of Impairment	Fecal Coliform, Biological, Turbidity
Primary Cause of Impairment	Storm Water Runoff

We will be unable to sustain our current population without abundant, clean, usable surface water resources.



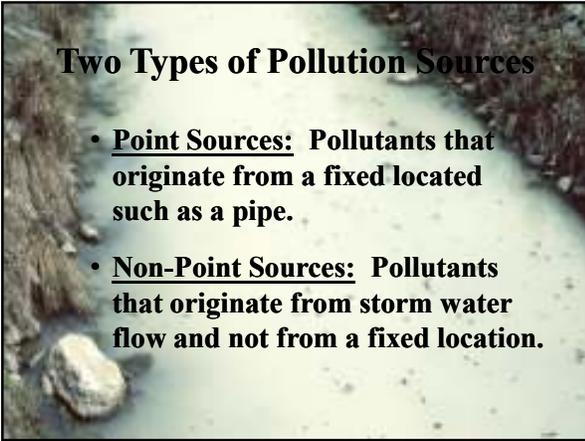
Water Quality Program

The goal of the Water Quality Program is to protect and restore the quality and usability of Mecklenburg County's surface water resources.



Two Types of Pollution Sources

- **Point Sources:** Pollutants that originate from a fixed location such as a pipe.
- **Non-Point Sources:** Pollutants that originate from storm water flow and not from a fixed location.



Point Sources of Pollution



Find & Eliminate Pollution Sources

The discharge of wash water from construction sites is prohibited.



Wash waters must be treated in a sediment basin or an alternative method used to prevent the discharge of pollutants.

The discharge of pollutants from building materials, building products, construction wastes, and trash is prohibited.



Materials must be properly contained and covered to prevent discharges.

The discharge of pollutants from spills and leaks is prohibited.



Measures must be implemented to prevent spills and leaks and a spill response plan developed.

The discharge of concrete is prohibited.



Concrete washout stations must be established to prevent discharges.

The discharge of stucco, paint, curing compounds and other construction materials is prohibited.



Materials must be properly handled, collected and disposed of.

The discharge of fuels, oils, antifreeze and other products used in vehicle and equipment operation and maintenance is prohibited.



These materials must be properly stored and handled to prevent discharges.

The discharge of pesticides, herbicides, fertilizers and chemicals is prohibited.



These materials must be properly stored, handled and applied to prevent discharges.

The discharge of sewage is prohibited.

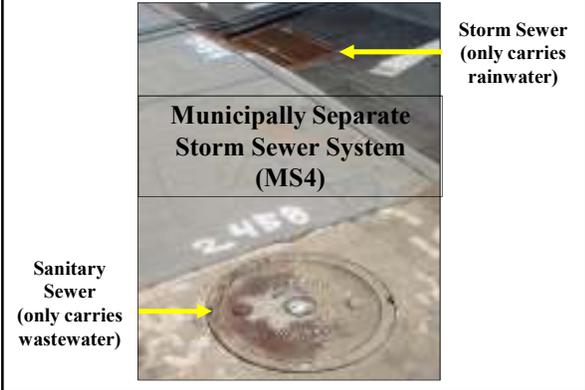


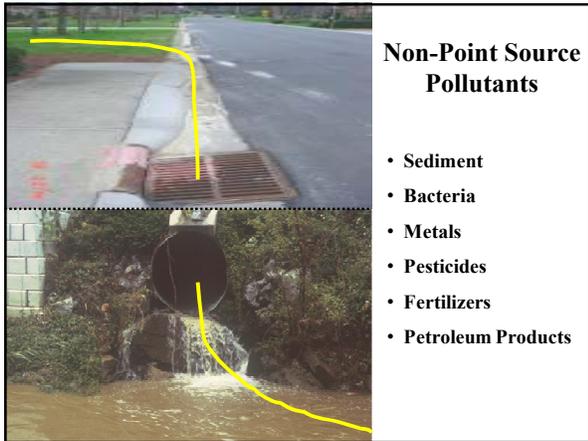
Sewage must be properly stored, handled and disposed of to prevent discharges.

Discharge of Pollutants Prohibited



Non-Point Sources of Pollution



















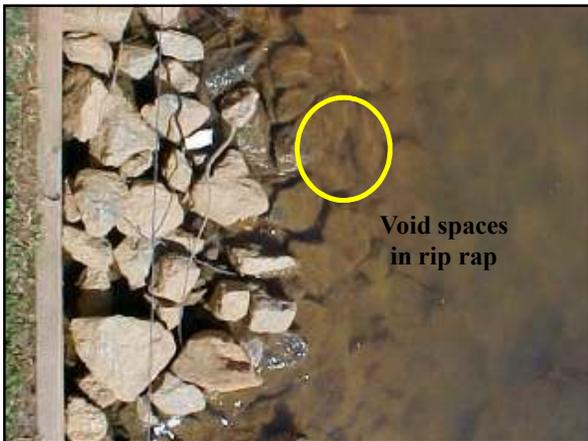


















Sediment clogs the gills and fish causing them to suffocate. It also clouds the water interfering with their ability to find food.





Sediment deposits bacteria, heavy metals and other pollutants in surface waters.



Sediment buries wetlands destroying plants and aquatic life.







Rules & Regulations

Regulatory Agencies

- Federal
 - US Environmental Protection Agency (USEPA)
 - US Army Corps of Engineers (USACE)
- State
 - NC Department of Environment and Natural Resources (NC DENR)
 - Land Quality Section
 - Division of Water Quality (& Meck. Co.)
- Local
 - City of Charlotte
 - Mecklenburg County

US EPA

- General Permit Inspection/enforcement
- Civil Penalties >\$25,000

US ACE

- Regulates dredge and fill of jurisdictional wetlands and streams under authority of 404 permits
- Issues cease and desist orders

NC DENR – Land Quality

- Sedimentation Pollution Control Act of 1973
 - Five Mandatory Standards
 - Erosion and Sediment Control (E&SC) Plan Required
 - Approved plan must be followed
 - Buffer Zones
 - Stabilization of Cut and Fill Slopes
 - Groundcover Required within 21 days
- Civil penalties up to \$5,000 per day

NC DENR – Water Quality

- 401 Certifications for impacts to jurisdictional waters
- Construction Site Storm Water General Permit (NCG010000)
- Civil Penalties up to \$25,000/day/violation

NCG010000

- Governs ALL sites equal to or greater than one acre
- Subject to permit in addition to the approved E&SC Plan
- Authority delegated to States from US EPA under requirements of the Clean Water Act

NCG01000 Requirements

- E&SC Plan Approval
- Approved Plan Must be Followed
- Equipment Operation & Maintenance
- Material Handling
- Building Material Waste Handling

NCG01000 Requirements (cont'd)

- Litter and Sanitary Waste
- Concrete Handling
- Select, Install and Implement BMPs
- Monitoring & Reporting
- Documentation

Charlotte/Mecklenburg Soil Erosion and Sediment Control Ordinance

- City of Charlotte Code of Ordinances
 - Chapter 17
 - http://library.municode.com/HTML/19970/level2/PII_C17.html
- Mecklenburg County
 - Independent Ordinance
 - <http://charmeck.org/mecklenburg/county/WaterandLandResources/LandDevelopment/Documents/ErosOrd.pdf>

Statement of Purpose:

The sedimentation of streams, lakes, wetlands and other waters of this state constitute a **major pollution problem**. Sedimentation occurs from the erosion or depositing of soil and other materials into the waters. Control of erosion and sedimentation is deemed vital to the public interest and necessary to public health and welfare, and expenditures of funds for erosion and sedimentation control programs shall be deemed for a public purpose. It is the purpose of this chapter to provide for creation, administration, and enforcement of the program through procedures and for the adoption of mandatory standards that will **permit development of the county to continue with the least detrimental effects from pollution by sedimentation**. In recognition of the desirability of early coordination of sedimentation control planning, it is the intention of the city council that preconstruction conferences be held among the affected parties.

Applicability

- All Land-Disturbing Activity Except:
 - Agricultural Activities
 - Timber Harvest Activities Conducted in Accordance with BMPs set out in the NC Forest Practice Guidelines
 - Mining Activities
 - Emergency Operations
 - Land-disturbing activity regulated exclusively by the State

Land-disturbing Activity

- Means any use of the land by any Person in residential, governmental, industrial, education, institutional, or commercial development, highway and road construction and maintenance that results in a change in the Ground Cover or topography and that may cause or contribute to Sedimentation

General Requirements

(Chapter 17-31 or Section 6)

- E&SC Plan Approval (sites \geq 1 acre)
 - Approved Plan Must be Followed
 - Monitoring and Reporting
 - Performance Expectations
-
- Civil Penalties up to \$5,000/day/violation

Grading Permits

(Chapter 17-36 or Section 11)

- Required prior to any disturbance > 1 acre
 - Lands developed as a unit will be aggregated regardless of ownership
 - Exceptions:
 - Activities approved at preconstruction conference (installation of measures)
 - Activities for the purpose of fighting fires
 - Stock piling of sand, stone or gravel in processing plants and storage yards if...

Erosion & Sediment Control Plans

(Chapter 17-35 or Section 10)

- Include an authorized statement of financial responsibility
- Must comply with all Federal, State, and Local laws, rules, and regulations
- Specify the Construction Sequence
- Must be followed, or revised...

Getting Started...

- Notification of plan approval
- *Have site flagged* (limits, basins, outfalls, buffers)
- Contact Erosion Control Coordinator to schedule Preconstruction meeting
- Discuss Project scope and installation of tree protection and erosion control BMPs.
- Install measures, clearing only as necessary for installation or as agreed upon in the preconstruction meeting
- Contact Erosion Control Coordinator for inspection of measures and tree protection
- After Inspector verifies installation as specified in the approved plan, a grading permit will be issued and site development activities may commence

Field Changes/Disclosures

- Field Change process
 - Contact Inspector for approval
 - May be directed to revise plan
- Failures or deficiencies resulting in off-site sedimentation must be disclosed
- Emergency Situations

Monitoring & Maintenance

- Weekly inspections
- *NEW* NC DENR Inspection requirements
- Qualifying rainfall event inspections
- Documentation of failures/deficiencies
- Correction of failures/deficiencies

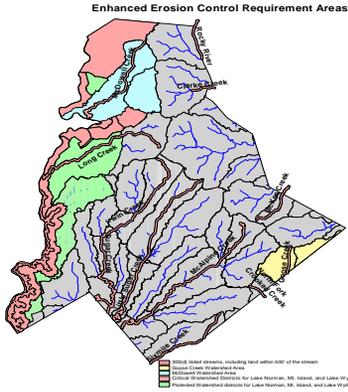
Performance Expectations

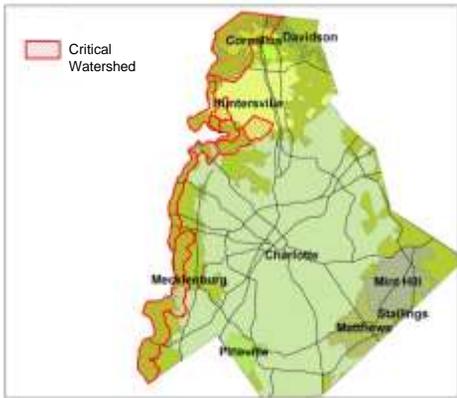
ABOVE ALL:

The plan must function to effectively prevent offsite impacts! If field changes are deemed insufficient or inappropriate, a plan revision may be required.

Policies

- Any project directly upstream of a privately-owned water feature (pond, lake, impoundment) may be required to survey sediment levels pre and post construction.
- Additional requirements in certain areas (303-d listed streams, Critical Areas, McDowell Creek watershed, Goose Creek watershed)
 - 5 day limit on time of exposure
 - Forebays required
 - Spillways designed for 25-year event
 - 20 acre limit on concurrent disturbance





Violations & Notices

- Notice of Violation (NOV)
- Notice of Continuing Violation (CNOV)
- Notice of Violation with Penalties (NOVP)
- Notice of Compliance (NOC)
- Notice of Compliance with Penalties (NOCP)

A NOV may be Issued if:

- It is first-time violation
- Deficiencies were identified not resulting in significant offsite sedimentation
- Verbal requests for corrections have proven ineffective

A CNOV may be Issued if:

- Corrective actions required by a NOV or inspection report were not completed by the specified date

A NOV may be issued if:

- Numerous violations are observed
- Off-site sedimentation is significant and unreported
- The Violator has a history of noncompliance
- The Violator is grading without a permit
- The Violator is grading beyond the approved limits of disturbance

Penalties

- Violations are subject to civil penalties up to \$5,000.00 **per day per violation**
- Aggravating/Mitigating circumstances will be considered when assessing penalty amounts

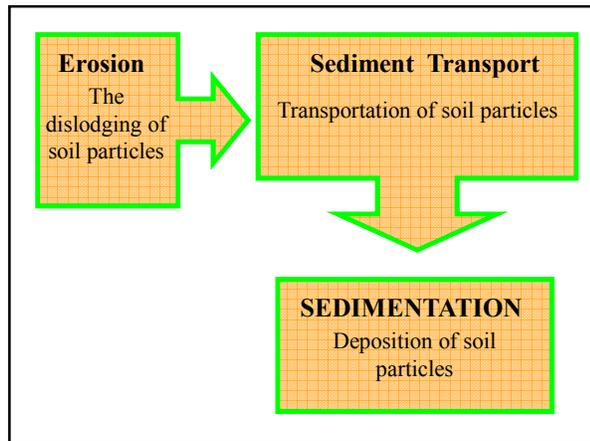
Appeals

- Penalty Meeting with Staff Supervisor to discuss factors
 - CMCSI
- Storm Water Advisory Committee Appeal Board (Formal)
 - \$100 filing fee
 - 30 day period to file appeal

Lesson Three

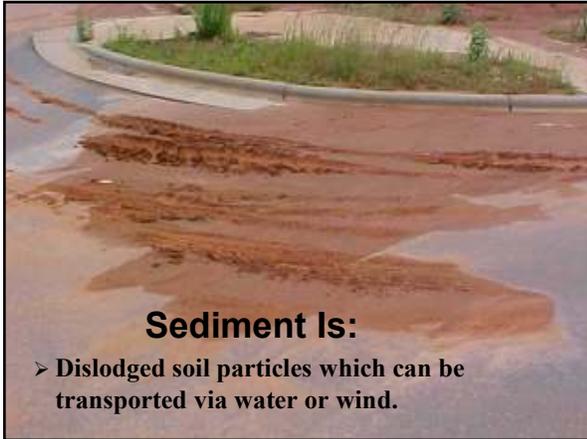
The Soil Erosion & Sedimentation Process

Understanding the difference between erosion, sediment & sedimentation



Erosion Is:

- Erosion begins with particle movement due to wind energy or the impact of rain drops.
- Overland flow of water moves dislodged soil particles creating rills or gullies.



Sediment Is:

- Dislodged soil particles which can be transported via water or wind.

Sedimentation is:

- Accumulation of dislodged soil particles in low points where flow of water slows down.
- Sediment settles out when reduced water velocities no longer have enough energy to carry the particles.

Factors That Influence Erosion

- Soil Type
 - Silt = Extremely susceptible to erosion
 - Clay = Moderately susceptible to erosion
 - Sand = Low susceptibility to erosion
- Vegetative Cover
 - Reduces erosive force of rain drops
 - Roots hold the soil together
- Topography
 - Slope length and steepness greatly influence volume and velocity of surface runoff

Factors That Influence Erosion

- Climate
 - Erosion risks are high during times when rainfall prediction is frequent, intense or lengthy.
- Seasonal Rainfall for Charlotte Area
 - Winter – Frequent
 - Spring – Frequent intense lengthy
 - Summer – Infrequent but intense
 - Fall – Frequent

Control Erosion :

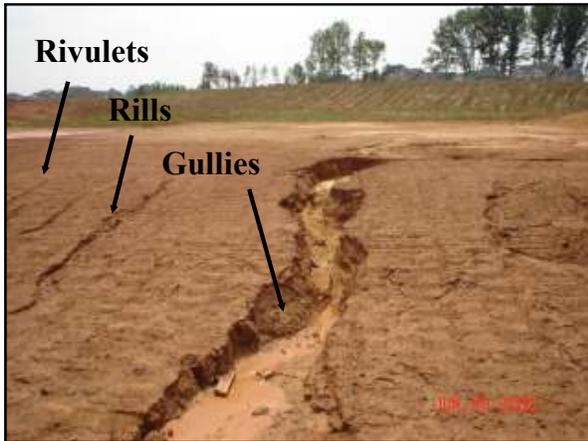
- Minimize disturbed areas
- Establish ground cover within 15 days
- Control flows
- Phase grading
- Inspect and maintain BMPs
- STABILIZATION

How to Control Sedimentation:

- Reduce erosion potential
- Reduce flow velocities
- Capture sediment near source
- Inspect and maintain BMPs
- STABILIZATION

Erosion & Sedimentation Problems Caused by Grading Operations

- Soils exposed from removal of vegetative ground covers
- Changes in drainage areas
- Increases in flows







GREEN SITES

The Environmentally Friendly Way

- Benefits of Ground Stabilization
- New NPDES Requirements
- Developing a Vegetation Plan
- Seedbed Preparation
- Seed Types
- Mulching and Rolled Erosion Control Products
- Other Methods of Stabilization

Stabilization is the best form of erosion and sediment control

Dense vegetation or other ground cover protects bare soils surfaces from the raindrop impact (scouring) and prevents EROSION

ENVIRONMENTAL BENEFITS:

- Reduces velocity of runoff and volume of runoff
 - Increases infiltration
 - Filters and helps remove pollutants
 - Recharges ground water
- Reduces sediment loads and other wastes in our streams

Benefits of Ground Stabilization

1. Reduces the chances for Civil Penalties
2. Reduces maintenance and repair costs on BMPs (sediment basins and silt fences) and increases the effectiveness of BMPs
3. Environmental benefits for our streams and ultimately our drinking water
4. Increases the marketing potential of a development

NPDES-Definitions

Ground Cover – Any vegetative growth or other material which, when applied to the soil surface, renders the soil surface stable against accelerated erosion.

Permanent Stabilization – When soil disturbing activity is completed and exposed soils have been stabilized with a vegetative cover with a density of at least 80% or covered with a structural stabilization method. Permanent perennial vegetation may include the use of sod, shrubs and ground cover plants mixed with mulching, aggregate or other landscaping techniques. Structural methods include concrete, asphalt, retaining wall or other stabilization techniques.

Temporary Stabilization – When the establishment of ground cover over all disturbed areas (such as mulching, rolled erosion control products, vegetation, or other material) renders the surface stable against accelerated erosion. Stabilization shall be achieved with the establishment of a uniform and evenly-distributed (i.e., without large bare areas) ground cover with a cover

New NPDES Requirements

21 Ground Stabilization

- (a) Soil disturbance shall be achieved on any area of a site where land-disturbing activities have been or will be permanently initiated according to the following schedule:
 - (1) All particular ditches, trunks, ditches, perimeter ditches and all slopes steeper than 1:1 shall be stabilized immediately or immediately after disturbance with ground cover or cover as practicable. See the approved erosion control plan for the land disturbance activity.
 - (2) All other disturbance areas shall be perennial vegetation or permanent stabilization with ground cover or cover as practicable but in any event within 14 calendar days from the last land-disturbing activity.
- (b) Conditions for meeting the stabilization requirements above, the following conditions or exceptions shall apply:
 - (i) Exemptions of cover may be approved by the permitting authority based on a written or other site-specific conditions that make a compliance impracticable.
 - (ii) All slopes 3% or flatter or ground shall apply the ground cover within 7 days except when the slope is flatter than 4:1. Slopes less than 3:1 shall apply ground cover within 14 days except when slopes are steeper than 3:1, the 7 day requirement applies.
 - (iii) If a slope is steeper than 4:1 shall be exempt from the 7 day ground cover requirement.
 - (iv) Slopes 3% or less in length shall be exempt from the 7-day ground cover requirement when the slope is steeper than 2:1.
 - (v) A through stabilization is usually specified as ground cover; other methods, such as structural stabilization, may be allowed on a case-by-case basis.
 - (vi) For portions of projects within the Tailwater Control Commission's flood "High Quality Water Zone" (HQWZ) (44 C.F.R. 33.81), stabilization with ground cover shall be achieved as soon as practicable but in any event on all areas of the site within 7 calendar days from the last land-disturbing act.
 - (vii) Portions of a site that are lower in elevation than adjacent discharge facilities and are not expected to discharge during construction may be exempt from the temporary ground cover requirements if included in the approved T&C Plan as added by the permitting authority.

Begin with a Vegetation Plan Construction Sequence Schedule

Consider critical areas where accelerated erosion may occur:

- Steep slopes, long slopes, cut and fill slopes
- Adjacent to a water course, critical watershed, or adjacent to a 303d listed stream
- Stockpiles – 50' from storm drains or streams (New)
- Soil types – Silt, Clay or Sand?
- Plans must contain NPDES requirements, seeding schedules, phasing in the construction sequence, and how to stabilize critical areas.

Charlotte/Mecklenburg Land Development Standards 30.17
Remember: If the area does not need to be disturbed then don't disturb it

Developing a Vegetation Plan

Climate:

Help determine the appropriate plant selections based on cold-hardiness, heat tolerance, high humidity, and resistance to disease

What time of year will you be seeding?

Direction:

South and West facing slopes tend to be warmer and drier

North facing slopes tend to be more shaded and subject to freezing in the winter

Developing a Vegetation Plan

Top soiling – preserving topsoil to enhance final site stabilization with vegetation

OR apply compost amendments

- Increases vegetation growth due to high organic matter and increased biological activity – microorganisms that enhance plant growth thrive in topsoil
- Topsoil and compost is less erodible, increases infiltration and reduces runoff
- More cost effective – reduce fertilizer, lime and watering needs

Seedbed Preparation

Surface Roughening - Slopes

Roughening bare soil surfaces with horizontal groves running across the slope, stair stepping, or tracking with construction equipment



Steeper slopes, longer slopes, and fill slopes are more susceptible to erosion and are more expensive to construct and maintain

Don't forget... Proper compaction, proper tracking, and terracing

Seedbed Preparation

- Scarifying the Soil- Loosen the soil 4-6 inches by using a spike tooth harrow as shown or tilling, disking or a harley rake
- Surface roughening will help retain lime, fertilizer, seed, and reduce runoff velocity and increase infiltration
Not scarifying the soil will reduce your chance of success to establish grass by up to 50%.

Scarifying can also help construction compacted soils return to pre-development conditions (pre-development curve number and time of concentration)

Seedbed Preparation

Soil Test – Do your test once the top soil has been stripped. Contact the Mecklenburg County Soil and Water Conservation or the North Carolina Department of Agriculture for the test kit (Free test)
The test will tell you exactly how much fertilizer and lime is needed.

Proper pH balancing is key (pH 6.0 – 7.0).

Proper Seedbed Preparation – If you don't give the seed an opportunity to penetrate the soil then it will be displaced by wind, rain, or surface runoff and the seed will not have a chance to germinate.

Seedbed Preparation

Lime and Fertilizer Application- Per the soil test results or

Lime – 4000 lbs/ acre of pulverized agricultural grade

Fertilizer – 1000 lbs/acre of 10-10-10 or equivalent nutrients. Slow-release sources of nitrogen (preferred from a water quality standpoint) may be used.
Apply uniformly and mix well with top 4-6 inches

Seed Types
Recommended Native Herbaceous Plants



Switchgrass
(12/1-4/1)



Pear-tongue
(5/1-7/1)

Other Native Species: Indiangrass, Big Bluestem, Little Bluestem, Sweet Woodreed, Rice Cutgrass, Indian Woodoats, Virginia Wild Rye, Eastern Bottlebrush Grass, Soft Rush, Shallow Sedge, Fox Sedge
 See NCDENR Design Manual for additional information

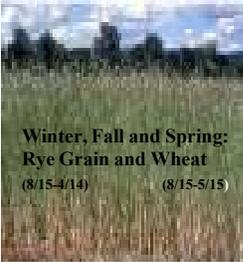


Native Grasses

- 35% Indiangrass
- 20% Switchgrass
- 15% Little Bluestem
- 15% Big Bluestem
- 10% VA Wild Rye
- 5% Purple Lovegrass

Seed Types

Annuals – Grow rapidly and then die in one growing season
 Useful for quick, temporary ground cover.



**Winter, Fall and Spring:
Rye Grain and Wheat**
(8/15-4/14) (8/15-5/15)



**Summer:
German millet or
Browntop Millet**
(5/15-8/15)

Obtain uniform seed distribution by using a hand-held seeder, drop spreader, conventional grain drill, cultipacker seeder, or hydraulic seeder.

Mulch

➤ Evenly apply **4000 lbs/acre** of clean straw (rye or wheat) or equivalent hydroseeding.



➤ Anchor mulch to prevent displacement:

- Mulch anchoring tool (Crimper tool)
- Synthetic binders or asphalt (10 gallons per 1,000 sf)
- Hydro-Mulch/ Hydro-Seeding
- Mulch netting

Other Stabilization Methods

Sod



Riprap



Other Stabilization Methods

Hardwood Mulch



Other Plantings



Other Stabilization Methods

Gabions



Hydro-seeding

- Mixture of water, fertilizer, lime, seed, and fiber mulch (paper, wood, blends)
 - Wood fiber is better than paper because it allows the seed to breathe.

Advantages:

- Jet nozzles and hoses provide accessibility to hard to reach places and steep slopes.
- Quick with high germination rates



Rolled Erosion Control Products

- Manufactured products designed to reduce soil erosion and aid in the germination and establishment of a vegetative cover.
- They are generally used in areas where seed and straw are not sufficient and seed germination is difficult.

NOV 05, 2008





Excelsior Blanket

-This is a **temporary matting** and will usually only last through one growing season.

-Can be used on gentle slopes where seed and straw are insufficient.



Straw Blanket with Coir and Jute

Can be used with higher velocities than Excelsior.

- This product is biodegradable in approximately 2 years.
- Ideal uses are on steeper slopes or small drainage channels.



Pyramat

- This is a **permanent liner** that will allow for vegetation to still be present.

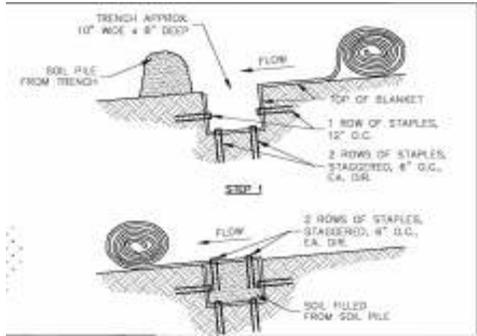
USES: Larger drainage channels with steeper slopes, emergency spillways in place of rip rap, areas of high velocities and concentrations.







Erosion Control Matting Installation Detail



Erosion Control Blanket Problems

- Blankets undermined
- Poorly secured with staples
- Ends not properly buried



Questions?

THINK GREEN



The What, When, and How of Creek Crossings



Permits

- What types of permits are there for creek crossings?
Federal (Army Corps of Engineers)
 Section 404 of the Clean Water Act (CWA)
 Nationwide 39 (Commercial and Institutional)
 and Nationwide 29 (Residential)
 All Impacts to streams or wetlands require written notification to and approval by the Army Corps of Engineers (zero threshold)

State
 Section 401 of CWA
 NCDWQ general certification 3705 required if:
 Impacts of >150'; Any impacts to streams in Catawba Basin; Any impacts involving excavating or dredging; impacts to wetlands totaling 1/10 of an acre or more

Mitigation required (>150', >1/10 acre wetlands)
 Mitigation is **EXPENSIVE** \$323 - \$487 per linear foot, depending on availability...

Permits

When are the permits required?
 Anytime there is a temporary or permanent impact to a "Water of the U.S." i.e. a jurisdictional water, meaning any stream that is *perennial* or *intermittent*, or *any wetland, pond or other water...* regardless of current flow.
All general & regional conditions must be met or an individual permit is required

Can you tell the difference?

- ***Ephemeral*** stream channels- convey storm water flow only
- ***Intermittent*** stream channels- convey ground water and storm water flow, and by name, exhibit periodic flow depending on ground water table
- ***Perennial*** stream channels- convey ground water and storm water flow, under normal conditions exhibit flow year round
- Remember...permits are required for impacts to jurisdictional waters of the U.S. (**intermittent or perennial streams**)













Temporary Crossings

- Temporary culvert crossings will alter the bed and bank
- Mud mats or other temp bridges should be used minimally and **ONLY** for the transfer of equipment
- All temporary crossings **MUST** be coordinated and **approved** by the inspector

















Bottom line...

- Always coordinate with the inspector
- Plan ahead
- There is almost always a way to avoid temporary crossings for the use of logging and clearing



What you must do...

- Be sure you have all the necessary required permits
Impacts must match what's on the 404 permit
- Impacts and restoration must match what's on the permit and 401 certification (NCDWQ conducts periodic compliance inspections)
- Schedule a Pre-Construction meeting with your inspector prior to starting any work!
- Follow approved plans
- Stay in contact with your inspector
- Protect our surface waters

Consider your regulator as a resource...
We are there to help!



How to proceed...

- Schedule a pre-construction meeting
- Determine the method for work taking place in a dry creek channel
- Choices
 - Pump around
 - Temporary pipe
 - Clean water bypass ditch
 - Combination

How to proceed...

- Prior to beginning with construction have a definite plan for coffer dam construction and its location...REMEMBER you must completely stop the flow of the water
- Keep coffer dams and downstream check dams within the permitted linear impact measurement

How to proceed...

- Prior to commencing with the creek crossing, ALL MATERIALS MUST BE ON SITE
- If possible, three days of clear weather should be in the forcast prior to work starting
- Proceed with work only after the inspector gives permission to start

Installation of Coffor Dam

- There are many different types of coffer dams. When selecting the appropriate dam for your site, you must take into consideration watershed, anticipated flow and future weather conditions.
- Consult with your engineer for the correct size of the coffer dam.









Down Stream Check Dams

- The Charlotte/Mecklenburg Land Development Standards Manual requires down stream check dams. Be sure you coordinate with your inspector for the locations and number of check dams prior to installation.
- Remember, these locations must be with in the disturbed and permitted area.





De-Watering Footings

- During the excavation of the footings, consideration must be given not only to sediment control along the creek but how will you de-water your footings.
- Discharge of ground water must be clean!
- Consult with your inspector on how and where this ground water may be discharged.











If permission is given and the footing ground water is clean
You may discharge it to the upper down stream check dam.



Pump Around The Clean Water

- Remember your coffer dam stops the flow of water to allow work to proceed within the creek channel.
- Provisions must be made to move unexpected storm water around the site.
- Be sure you have large enough pumps to move the creek water below / around your crossing.













Temporary Creek Re-location

- This method is not used often due to the high cost of construction. All temporary creek re-location must be approved by the ACE and NCDWQ and specifically listed on the 401 and 404 permits.
- The design must be done by a registered NC Engineer.









Alternative Method

Another way of moving the creek's water through the job site is to temporarily pipe the creek. Approval from NCDWQ and the WQ program must be obtained prior to the installation of the temporary pipe.

- It is important that a registered engineer calculate both the type and size of the pipe that will be used.**









Setting the Structure

Types of creek crossing structures

- **Bottomless culvert**
- **Box culvert**
- **Single barrel pipe**
- **Multiple barrel pipes**
- **Mickey Mouse pipe**

No matter what type of structure is installed, the requirements mandate that the bottom of the pipe is installed approximately 1 foot below the existing creek channel to ensure migration of fish, amphibians, reptiles and our micro-macro invertebrates.























Clean Water Bypass
once the pipes have been installed

- A bypass pipe may be installed in the coffer dam to allow clean water to flow through the pipe during the final phase of completing the creek crossing.
- Be sure to obtain permission from you inspector prior to installing this bypass pipe.







- **Keep the clean water bypass installed and maintained until the construction zone is stabilized.**
- **Remove the pipe only after obtaining the inspector's approval. This includes the Land Development inspector as well.**
- **The crossing is not considered complete until permanent stabilization has been achieved.**

Remember your 401 and 404 permits do not allow rip-rap in the creek channel. The creek channel must remain un-hardened





Examples of BAD Creek Crossings

This is what we don't want to see!









Examples of Good Creek Crossings

This is what we want to see!















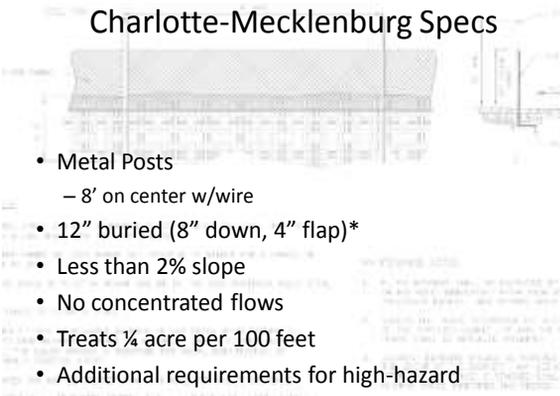


Installation and Maintenance of Erosion Control BMPs

Silt Fence

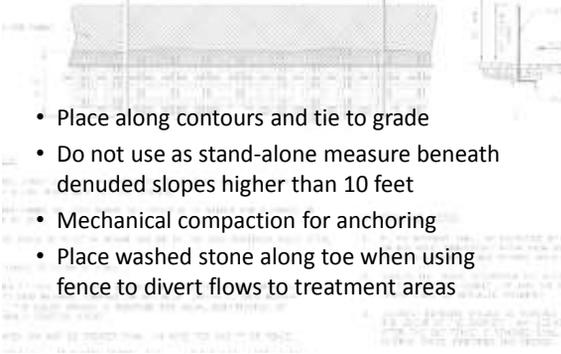
- Applications
 - Treat small disturbed areas
 - Flow diversion (2% grade)

Charlotte-Mecklenburg Specs



- Metal Posts
 - 8' on center w/wire
- 12" buried (8" down, 4" flap)*
- Less than 2% slope
- No concentrated flows
- Treats ¼ acre per 100 feet
- Additional requirements for high-hazard

DENR Recommendations

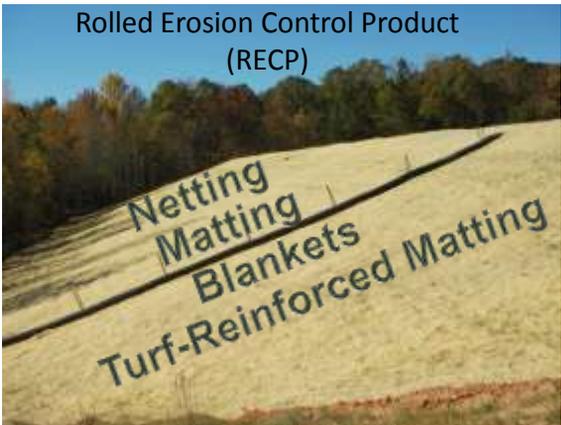


- Place along contours and tie to grade
- Do not use as stand-alone measure beneath denuded slopes higher than 10 feet
- Mechanical compaction for anchoring
- Place washed stone along toe when using fence to divert flows to treatment areas

Maintenance

- Inspect weekly and after rain
- Restore storage area when sediment accumulation reaches 9"
- Replace worn or damaged sections
- Stabilize/repair drainage areas

Rolled Erosion Control Product (RECP)



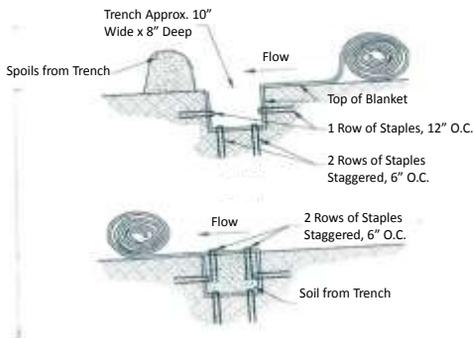
Applications

- Slopes 2:1 or steeper
- When mulch cannot be adequately tacked
- Where immediate ground cover is needed
- Vegetated channels (check shear stress)

Considerations

- Design specifications (use the right RECP... correctly)
- Ground contact
- Seed bed preparation
- Manufacturer-specific directions

Installation



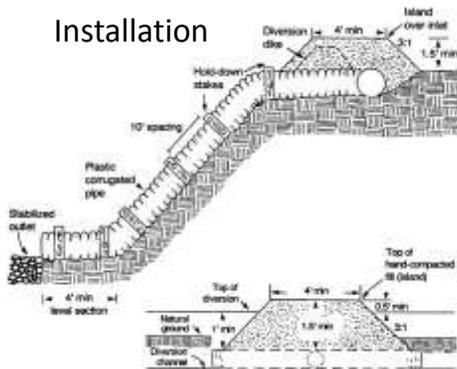
Application

- Below small
- Inspect weekly and after rains for signs of undermining or washout
- Correct deficiencies and repair damaged areas immediately

Slope Drains

- Convey flows at denuded slopes while permanent vegetation is established
- Convey flows at denuded slopes while permanent drainage is addressed

Installation



Installation

- Earthen diversion with storage area and energy dissipation
- Berm 1' above top of pipe at all locations
- Hand compaction around inlet pipe
- Ensure connections are watertight

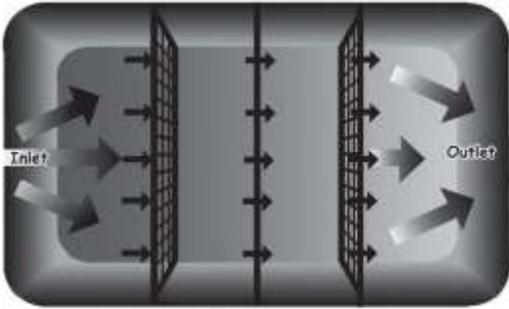
<u>Drain Area</u>	<u>Pipe Diameter</u>
0.50 acres	12"
0.75 acres	15"
1.00 acres	18"

Maintenance

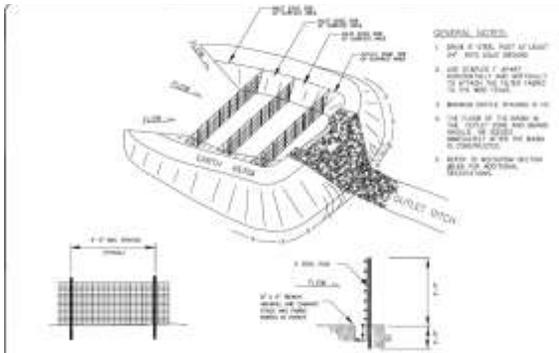
- Inspect inlet area
- Repair washouts
- Remove accumulated sediment at inlet
- Inspect discharge area
- Inspect berm/slope

Porous Baffles

- Eliminate basin 'short-circuiting'
- Promote plug flow for most effective trapping efficiency



Installation



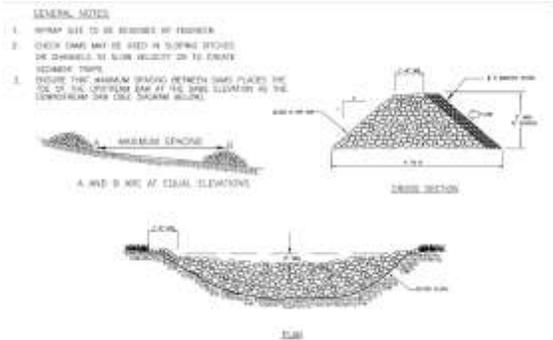
Maintenance

- Inspect baffles weekly and after every rain
- Maintain access for repairs
- Replace when torn, collapsed, decomposed or ineffective
- Remove sediment when half full
- Design life of 6-12 months

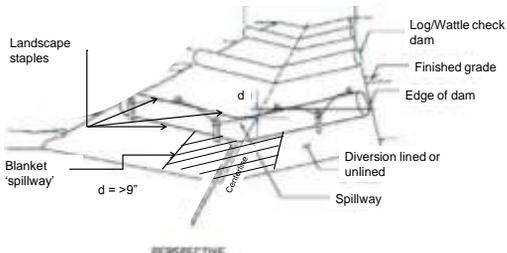
Check Dams / Grade Control

- Reduce velocity
- Reduce rill/gully erosion
- Reduce basin maintenance
- Can provide dosing method for PAM
- Do not use in jurisdictional waters

Rock Check Dam Installation



Wattle/Log Check Dam Installation



Note: ensure secure contact with the ground. Use scrap erosion control blanket to plug gaps.

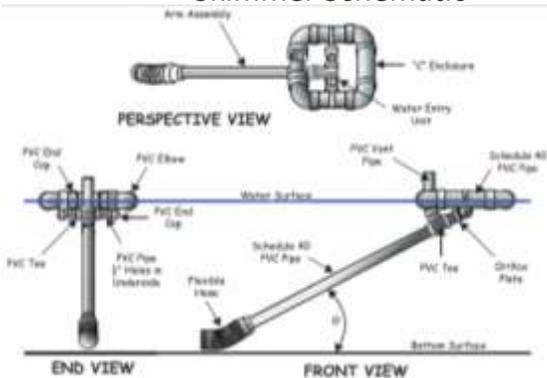
Maintenance

- Inspect weekly and after rain
- Expect damage from high flows washing around edges of the dam; repair immediately
- Remove accumulated sediment as necessary to prevent damage to channel vegetation
- Adjust elevations as necessary
- Do not use in jurisdictional waters

Skimmers

- Dewater from the top of the water surface
- Provide most efficient removal for gravity-treatment basins
- Dewatering rate controlled by orifice plate (drawdown in 2-5 days)
- Can be re-used
- Require more frequent maintenance

Skimmer Schematic



Common Problems

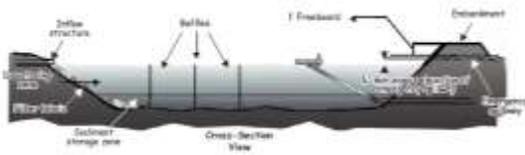


Figure 6.44c. Example of a wastewater tank with a skimmer outlet and emergency spillway. From Pennsylvania Green and Sediment Pollution Control Manual, March, 2006.

- L/W ratio
- Freeboard
- Failure at outlet pipe
- Inflow armoring
- Configuration changes
- Orifice size
- Orifice fouling
- Spillway damage

Maintenance

- Inspect weekly and after rain
- Check orifice plate for blockage
- Ensure skimmer floats freely
- Use rope to 'bob' skimmer to remove debris from screen
- Inspect inlets
- Inspect skimmer assembly for any damage
- Check spillway and outfall

INSPECTION RECORD

FOR ACTIVITIES UNDER STORMWATER GENENERAL PERMIT NCG010000 *

(12/29/09)

PROJECT: _____ MONITORING FOR THE WEEK BEGINNING: _____

RAINFALL: A rain gauge shall be maintained onsite and a record of the daily rainfall amounts shall be kept.

Day or Date:						
Rainfall Amount (inches):						
Initials:						

ASSESSMENT OF CONTROL MEASURES: All control measures must be inspected at least once per seven calendar days and within 24 hours after any storm event of greater than 0.5 inches of rain per 24 hour period.

Measure Identification (i.e., silt fence, sediment pond, sediment trap, ground cover)	Date of inspection	Initials of inspector	Operating Properly (Y/N)	Corrective Actions Taken	Date Corrective Action Taken

STORMWATER DISCHARGE OUTFALLS: All stormwater discharge outfalls must be inspected at least once per seven calendar days and within 24 hours after any storm event of greater than 0.5 inches of rain per 24 hour period.

Stormwater Discharge Outfall Identification	Date of Inspection	Initials of Inspector	Is Erosion Seen Near Outfall? (Y/N)	Describe evidence of other pollutants discharging from the site such as oil sheen, discoloration, cement wastes, sanitary waste, fertilizers, or fuel or material storage leakage.

VISIBLE SEDIMENTATION AND/OR STREAM TURBIDITY: Record corrective actions taken in “ASSESSMENT OF CONTROL MEASURES” above.

- Is there any visible sediment deposited in a stream, wetland or buffer? Yes ____ No ____ Date(s) _____ DWQ contacted? ____
 - Is there any visible sediment deposited on adjacent property(ies)? Yes ____ No ____ Date (s) _____
 - Is there any visible decrease in stream clarity (increased turbidity-cloudy) because of a discharge? Yes ____ No ____ Date(s) _____
- Has all land disturbing activity been completed? (Y/N) ____ Has the final permanent ground cover been completed & established? (Y/N) ____

By this signature, I certify, in accordance with Part II Sec. B(10) of the NCG010000 permit, that this report is accurate and complete to the best of my knowledge

Signature of Permittee or Designee: _____ Date: _____

* For a digital copy of this form and other information about the Construction General Permit, see: <http://portal.ncdenr.org/web/wq/ws/su/construction>

Conducting
Construction Site
Inspections

Permit No. NCG010000

NCDENR LQ Requirements

(Charlotte and Mecklenburg
County Soil Erosion and
Sediment Control Ordinance)

Permit Requirements

- Approved Plan from Permitting Authority
- Implementation of Plan
- Equipment Maintained to Prevent Pollution
- Spill plan
- Proper use of Herbicides, Pesticides and Fertilizers
- Control of Solid Wastes
- Monitoring and Reporting

Inspection Frequency

Requirement:

- Once per week
- Within 24 hours of any 1/2" or greater rainfall event
- Twice per week if discharging to a 303(d) listed stream impaired by a construction related parameter (turbidity, sedimentation)

Recommended:

- Prior to a forecast rainfall event
- After any run-off producing rainfall event

Inspection Components

1. Identification of Resources
2. Plan Digestion
3. Spotting Existing / Potential Problems
4. Documentation, Monitoring and Follow up

Section 1: Resources

- Report method
- Contacts
- Reference Material
- Continuing Education

Report Method

- Standard / Custom Form?
- State Form?
- Digital Data Collection?
- Log Updates?

Contacts

- Site Work Contact?
- Owner's Agent?
- Design Engineer?
- Regulatory Inspector?
- Consultants?
- Utility Subs?

Reference Material

minimum

- *North Carolina Erosion and Sediment Control Planning and Design Manual*
- *North Carolina Erosion and Sediment Control Inspector's Guide*
- Local Standards
- Approved Plan
- State Website
- EPA Website

Cont. Education

- Workshops
- IECA
- Others?

Section 2: Plan Digestion

- Read the Plan!
- Identify Erosion Measures
- Identify Areas of Concern

Read The Plan

The text

- Construction Sequence
- Erosion Control Notes
- Details
- Seeding Schedules
- Special Instructions
- Contact Information

Sequence

- Crossings?
- Clean Water Diversions?
- Phasing?
- Alterations to Measures? (BMP's, resizing)
- Others?

Details

- Basins? Basin tables? Dimensions?
- Check dams?
- Sediment fence?
- Slope drains?
- Outlet structures?
- Dewatering structures?
- Construction within a creek bank?
- Others?

Seeding Schedule

- When/What to seed?
- Application rates?
- Soil test?
- Lime and fertilizer?

Special Instructions

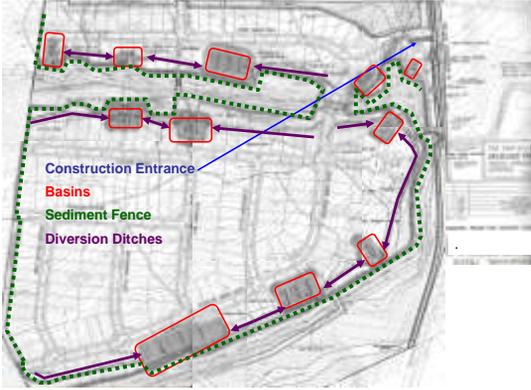
- 401/404 Permits?
- Individual Permit?
- Driveway Permit?
- Buffers?
- RECP Installation?
- Steep Slopes?
- Special Waters?
- Others?

Contacts

- Design Engineer
- Owner
- Regulatory Inspector
- Others?

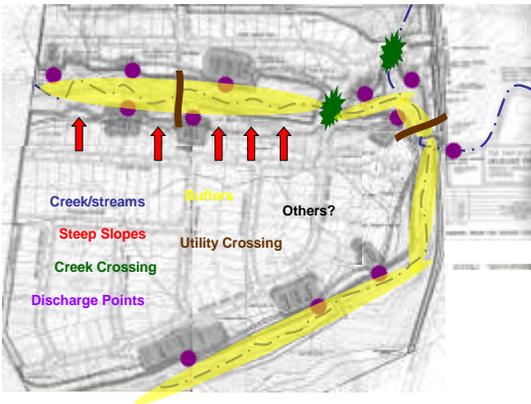
Plan Digestion

1. Read the Plan!
2. Identify Erosion Measures
3. Identify Areas of Concern



Plan Digestion

1. Read the Plan!
2. Identify Erosion Measures
3. Identify Areas of Concern



Section 3: Existing and Potential Problems

- Prevent Erosion
- Capture Sediment
- Conduct the Inspection

Protection

- Protect land surfaces from erosion
- Provide stabilization of denuded areas within 21 days of last activity
- Manage velocity
- Capture Sediment

Basins

- Is Stone Clean and Loose? Outlet Structure?
- Clean out stake present?
- Embankments?
- Baffles?
- Dimensions?
- Storage Volume? Access? Spoils?
- Outfall?
- Visible Sedimentation?

Construction Entrance

Community Ambassador!

- Rough?
- Dimensions?
- Function?

Fencing

- Trenched and Backfilled?
- On the Contour?
- Storage Volume?
- Concentrated Flows?

Slopes

- Tracked / Lifted Correctly?
- Ratio? Per Plan?
- Terraces? (NC Eros. & Sed. Control Planning and Design Manual, Table 6.02a)
- Rills?
- Slope Drains?
- Stabilization? (RECP? Mulch? Vegetation?)

Crossings

The Danger Zone

- Sequence?
- Temporary?
- Permanent?
- Schedule? Forecast?
- Pump Around?
- Impound?
- Stabilization?
- Permit Requirements? (401/404?)

Temp. Diversions

- Drainage Area Per Plan?
- Rill/Gully Erosion?
- Checks Dams?
- Source of Concentration?

Outfalls

- Receiving Waters / Off Site Impacts?
- Energy Dissipater?
- Discharge to Stable Area?
- Post-treatment/Pre-treatment?
- Sediment Fence?
- Off-site Sedimentation?

Section 4: Documentation, Monitoring and Follow-up

- Qualitative Monitoring
- Photographs
- Inspection Reports
- Follow up

Qualitative Monitoring

- Most Frequently Missing Element!
- Conduct at Discharge Points

Qualitative Monitoring Requirement:

- Stormwater Discharge Observed for the following parameters:
 - Clarity
 - Floating Solids
 - Suspended Solids
 - Oil Sheen
 - Other Visible Signs of Pollution

Photographs

- Important documentation tool
- Carefully note location and date of each photograph
- Pictures of mud alone don't tell much of a story
- Include with inspection record
- Send interesting ones to me

Inspection Reports

- Create on-site
- Include as much detail as necessary to accurately convey conditions, but no more
- Practice consistency
- Provide to correct Contacts
- Kept on location with plans and permits
- May be used in court
- Prove diligence

INSPECTION RECORD
FOR ACTIVITIES UNDER STORMWATER GENERAL PERMIT NCG010000 * (12/29/09)

PROJECT: _____ MONITORING FOR THE WEEK BEGINNING _____

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Day or Date:	Rainfall Amount (inches):	Initials:

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- Is there any visible decrease in stream clarity (increased turbidity/cloudy) because of a discharge? Yes ___ No ___ Date(s) _____

Has all land disturbing activity been completed? (Y/N) ___ Has the final permanent ground cover been completed & established? (Y/N) _____

By this signature, I certify, in accordance with Part II Sec. B(10) of the NCG010000 permit, that this report is accurate and complete to the best of my knowledge.

Signature of Permittee or Designee: _____ Date: _____

Follow up

- As severity of deficiency dictates
- Should be documented
- Ask for notification

Equipment

- Appropriate footwear
- Safety Vest
- Hardhat
- Flashlight
- Auger
- Probe
- Tape
- Pocket knife
- Manhole opener
- Shovel
- Camera
- Gloves
- Orange paint
- First-Aid Kit
- Machete



North Carolina Department of Environment and Natural Resources

Division of Land Resources

Land Quality Section

James D. Simons, P.G., P.E.
Director and State Geologist

Beverly Eaves Perdue, Governor
Dee Freeman, Secretary

Announcement of Self-Inspection Program

The Sedimentation Pollution Control Act was amended in 2006 to require that persons responsible for land-disturbing activities inspect a project after each phase of the project to make sure that the approved erosion and sedimentation control plan is being followed.

Rules detailing the documentation of these inspections take effect October 1, 2010.

The self-inspection program is separate from the weekly self-monitoring program of the NPDES Stormwater Permit for Construction Activities. The focus of the self-inspection report is the installation and maintenance of erosion and sedimentation control measures according to the approved plan. The inspections should be conducted after each phase of the project, and continued until permanent ground cover is established.

Excerpts from the North Carolina General Statutes and the North Carolina Administrative Code concerning self-inspections are enclosed. To better explain the requirements, a list of Frequently Asked Questions is also enclosed, along with a Self-Inspection Report form. The Self-Inspection Report form will also be available as an Excel spreadsheet from the Land Quality web site,

http://www.dlr.enr.state.nc.us/pages/sedimentation_new.html

Please take a moment to review the enclosed material. If you have questions, please contact the Land Quality Section at a DENR Regional Office.

New Self-Inspection Program for Erosion and Sedimentation Control

Effective October 1, 2010, persons conducting land-disturbing activities larger than one acre must inspect their project after each phase of the project, and document the inspection in writing.

Does this only apply to projects approved after October 1, 2010?

No, it applies to both old and new projects.

Who can conduct the inspection? The financially responsible party, landowner or their agent may conduct the inspection.

Is a special certification required to do the inspection? No

What is the goal of the self-inspection program? To make sure that the approved erosion and sedimentation control plan is being followed, including the installation and maintenance of measures, and the provision of ground cover in a timely manner.

What has to be inspected? All of the erosion and sedimentation control measures, including sedimentation control basins, sedimentation traps, sedimentation ponds, rock dams, temporary diversions, temporary slope drains, rock check dams, sediment fence or barriers, all forms of inlet protection, storm drainage facilities, energy dissipaters, and stabilization methods of open channels must be inspected.

What else has to be checked? The need for ground cover should be checked. Temporary or permanent ground cover must be provided on exposed graded slopes and fills within 21 calendar days of the completion of a phase of grading. Permanent ground cover must be provided within 15 working days or 90 calendar days (60 days in HQW zones), whichever term is shorter, upon the completion of construction or development.

Do newly installed sedimentation control basins have to be measured? Yes, the actual dimensions of the basins have to be checked, usually with a tape measure, and compared to the dimensions on the approved plan.

Do newly installed sedimentation control basins have to be measured by a Professional Land Surveyor? No. Generally the width and length of basins can be measured with a tape measure. A level and survey rod may be useful in checking the depth of a basin. Only relative elevations, comparing the bottom and top elevations are necessary.

What is a significant deviation from the approved plan? A significant deviation means an omission, alteration or relocation of an erosion or sedimentation control measure that prevents the measure from performing as intended. If the approved erosion and sedimentation control plan cannot be followed, a revised plan should be submitted for review.

Does it require a special form? A “Self-Inspection Report for Land Disturbing Activity as Required by NCGS 113A-54.1” is available for use. It can be completed by hand or completed as an Excel spreadsheet. An alternative is to make notations on the copy of the approved erosion and sedimentation control plan that is kept on the project site. Rule 15A NCAC 04B. 0131 states that “... documentation shall be accomplished by initialing and dating each measure or practice shown on a copy of the approved erosion and sedimentation control plan or by completing, dating and signing an inspection report that lists each measure, practice or device shown on the approved erosion and sedimentation control plan.”

Can I just use the NPDES Self-Monitoring Report? The NPDES Self-Monitoring Report may only be used to report that the maintenance and repair requirements for all temporary and permanent erosion and sedimentation control measures, practices and devices have been performed.

When do the inspections have to be done? Unlike the NPDES Self-Monitoring Report, the Self-Inspection Report for Land-Disturbing Activity does not have to be weekly. Rather, this report is completed after each phase of the approved erosion and sedimentation control plan is complete. Not every project will have all the possible phases, but the list of phases includes the following:

- Installation of perimeter erosion and sediment control measures;
- Clearing and grubbing of existing ground cover;
- Completion of any phase of grading of slopes or fills;
- Installation of storm drainage facilities;
- Completion of construction or development;
- Establishment of permanent ground cover sufficient to restrain erosion.

Where do I mail the report? Do not mail the report. The records must be made available to the erosion control inspector at the site. Any documentation of inspections that occur on a copy of the approved erosion and sedimentation control plan shall occur on a single copy of the plan and that plan shall be made available on the site. Any inspection reports shall also be made available on the site.

SELF-INSPECTION REPORT FOR LAND DISTURBING ACTIVITY AS REQUIRED BY NCGS 113A-54.1

PROJECT NAME:												PROJECT NO.:											
NAME OF INSPECTOR:												AFFILIATION*:											
												(*Landowner, Financially Responsible Party or Agent)											
ADDRESS OF INSPECTOR:																							
TELEPHONE NUMBER:																							
Signature:												Date:											
(Landowner, Financially Responsible Party or Agent)																							
Phase of Approved Erosion and Sedimentation Control Plan:												Mark (X)											
Installation of perimeter erosion and sediment control measures																							
Clearing and grubbing of existing ground cover																							
Completion of any phase of grading or slopes for fills																							
Installation of storm drainage facilities																							
Completion of construction or development																							
Establishment of permanent ground cover sufficient to restrain erosion																							
EROSION AND SEDIMENTATION CONTROL MEASURES INSPECTED:																							
Name/Number/ Location of Measure (List all measures on Plan)	Measures Installed Since Last Report		Measure Operating Properly (Yes/No)	Significant Deviation from Plan? (Yes/No)	Describe Corrective Actions Needed *																		
	Proposed Dimensions (feet)	Actual Dimensions (feet)																					

* List actions taken to correct deviation or restore sediment damage on "Actions Taken Sheet"

Erosion and Sediment Control Measures Inspected: (Continued)

Name/Number/ Location of Measure (List all measures on Plan)	Measures Installed Since Last Report		Measure Operating Properly (Yes/No)	Significant Deviation from Plan? (Yes/No)	Describe Corrective Actions Needed *								
	Proposed Dimensions (feet)	Actual Dimensions (feet)											
Ground Cover on Slopes (By Location)	Date Phase of Grading Complete	Date Ground Cover Provided	Is Ground Cover Sufficient to Restrain Erosion? (Yes/No)		Describe Corrective Actions Needed *								
Permanent Ground Cover (By Location)	Date Construction Complete	Date Ground Cover Provided	Is Ground Cover Sufficient to Restrain Erosion? (Yes/No)		Describe Corrective Actions Needed *								

*List actions taken to correct deviation or restore sediment damage on "Actions Taken Sheet."

Check your Certification Status Online:

1. Go to <http://aca.accela.com/charlotte/>
2. Under the blue box titled “Land Development” click on “Search Applications”
3. Enter your name (as you registered) in the block titled “Project Name:” and scroll to the bottom of the page to click “Search”.
4. Your results will appear at the bottom of the screen. The “Status” field will indicate whether your certification is issued or not.
5. If the status indicates that the certification was issued click on your permit number (e.g., LDCMCSI-2010-01172) to see additional details.
6. Click the small arrow to the left of the “Attachments” bar to view and print your certificate.
7. If you have any questions about your certification please call Jeff Bock at 704-560-9798 or Jay Wilson at 704-560-9798.



CHARLOTTE

Charlotte-Mecklenburg Certified Site Inspector (CMCSI) Seminar Evaluation



Your feedback is valuable to us. Please check the box that best describes your experience.

Lesson 1: “Sediment and Water Quality, Why We Care”

	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree
The material covered is relevant to my job.	<input type="checkbox"/>				
I found this lesson informative.	<input type="checkbox"/>				
The instructor was knowledgeable.	<input type="checkbox"/>				
I would recommend this lesson to others.	<input type="checkbox"/>				

Lesson 2: “Ordinance and Regulations ”

	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree
The material covered is relevant to my job.	<input type="checkbox"/>				
I found this lesson informative.	<input type="checkbox"/>				
The instructor was knowledgeable.	<input type="checkbox"/>				
I would recommend this lesson to others.	<input type="checkbox"/>				

Lesson 3: “Fundamentals of Erosion Control, Soil Erosion and Sedimentation Process”

	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree
The material covered is relevant to my job.	<input type="checkbox"/>				
I found this lesson informative.	<input type="checkbox"/>				
The instructor was knowledgeable.	<input type="checkbox"/>				
I would recommend this lesson to others.	<input type="checkbox"/>				

Lesson 4: “Vegetation and Stabilization”

	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree
The material covered is relevant to my job.	<input type="checkbox"/>				
I found this lesson informative.	<input type="checkbox"/>				
The instructor was knowledgeable.	<input type="checkbox"/>				
I would recommend this lesson to others.	<input type="checkbox"/>				

Lesson 5: “Creek Crossings”

	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree
The material covered is relevant to my job.	<input type="checkbox"/>				
I found this lesson informative.	<input type="checkbox"/>				
The instructor was knowledgeable.	<input type="checkbox"/>				
I would recommend this lesson to others.	<input type="checkbox"/>				

- Continue on Back -



CHARLOTTE.

Charlotte-Mecklenburg Certified Site Inspector (CMCSI) Seminar Evaluation



- Continued -

Lesson 6: "Installation and Maintenance of BMPs"

	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree
The material covered is relevant to my job.	<input type="checkbox"/>				
I found this lesson informative.	<input type="checkbox"/>				
The instructor was knowledgeable.	<input type="checkbox"/>				
I would recommend this lesson to others.	<input type="checkbox"/>				

Lesson 7: "Conducting Inspections"

	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree
The material covered is relevant to my job.	<input type="checkbox"/>				
I found this lesson informative.	<input type="checkbox"/>				
The instructor was knowledgeable.	<input type="checkbox"/>				
I would recommend this lesson to others.	<input type="checkbox"/>				

Overall CMCSI Seminar:

	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree
The material covered is relevant to my job.	<input type="checkbox"/>				
I found this lesson informative.	<input type="checkbox"/>				
The instructor was knowledgeable.	<input type="checkbox"/>				
I would recommend this lesson to others.	<input type="checkbox"/>				

Additional Comments:

Thank You!