



SEDIMENTS

Newsletter of the North Carolina Sedimentation Control Commission

STATE OF NORTH CAROLINA, DEPARTMENT
OF ENVIRONMENT AND NATURAL RESOURCES
William G. Ross, Jr. Secretary

Land Quality Section
Division of Land Resources
James D. Simons, Director and State Geologist

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Mountain Construction Projects: Minimizing Water Quality Impacts

The Balsam Mountain Preserve development is a new community on a 4,400 acre tract in the Little Tennessee River Basin in Jackson County. The tract had been previously owned by Champion Paper Company and had been managed for wood production. The development plan included 350 home sites of two acres each, an 18-hole golf course, a practice range, stables with several pastures, and several other amenities. More than 3,000 acres were set aside as the Balsam Mountain Trust, which will be preserved as a conservation easement for recreational use by residents.

The Preserve has thirty-eight miles of streams with fifteen miles considered perennial. The development occurs on the western side of the tract with most potential impacts occurring on Sugarloaf Creek and Cashie Branch.

The purpose of this project was to work closely with the preserve developer to install and evaluate a variety of erosion and sediment control systems to reduce the movement of sediment into surface waters. Dr. Rich McLaughlin, project leader from NC State University, conducted workshops to introduce these erosion and sedimentation control systems to developers, contractors, and public agency staff. The workshops were held periodically as the systems were tested and evaluated. Three sites were monitored for portions of the project time period.



First basin completed at Sports Garden and the site stabilized with grass.

The results are discussed by site:

Sports Garden Site

The Sports Garden consists of six acre area that was cleared and graded in early 2003. Steep slopes had to be graded to provide level areas for tennis and other amenities. Two sediment basins were installed in series to detain runoff.

Erosion was evident on the site until grass was established in late summer 2003. In addition,

water conveyances continued to erode even after the site was fully vegetated. This is common on active construction sites and one recommendation would be to encourage the use of ditch lining and geotextiles in water conveyances to reduce erosion.

Turbidity in basin samples usually dropped two orders of magnitude when left on the lab bench overnight, indicating that controlling velocity and turbulence in the small basin would settle this material more efficiently.

McLaughlin recommended that frequent, heavy use of mulches and vegetation be used on sites

similar to the Sports Garden site since the steep slopes can erode quickly as the grading progresses. Ditches should be stabilized using check dams and lining with geotextiles. The installation of the two-basin system worked well for smaller storms but turbidities were still high during high flow rates. An unusual characteristic of this site was that infiltration in the first basin eliminated

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February Action of the North Carolina Sedimentation Control Commission

At its meeting on February 16, 2005, the NC Sedimentation Control Commission (SCC) took the following action:

- ❑ Approved request for Local Program Contract Funds (LPCF) by Chatham County in the amount of \$48,498 to assist with the start-up of a local erosion and sedimentation control program. Funding is contingent upon the County requesting and receiving delegation of a local erosion and sedimentation control program from the SCC at the May meeting. The County is to submit their ordinance by April 1, 2005.
- ❑ Approved LPCF for Wilkes County in the amount of \$31,565 to assist with the start-up of a local erosion and sedimentation control program. This is contingent on the County requesting and receiving delegation of a local erosion and sedimentation control program from the SCC at the May meeting. The draft ordinance is under LQS staff review.
- ❑ Approved partial funding of Jackson County's request for \$31,616 to assist with the continued operation of their local program. The amount approved was \$6,144.
- ❑ Disapproved Pitt County's request for \$6,280 to assist increasing public education as it would be better suited for Sediment Education funding. The request has been forwarded to the Sedimentation Education Committee.
- ❑ Approved Rowan County's request for \$1,887 to purchase equipment to assist with the continued operation of their local program.
- ❑ Approved Wake County's request for \$604 to purchase equipment to assist with the continued operation of their local program.
- ❑ Disapproved the City of Winston-Salem's request for \$20,584 to assist with the continued operation of their local program as the program is on probation.
- ❑ Approved Haywood County's request to buy a printer capable of printing large pages for mapping. Haywood County will pay 60 percent of the cost if 40 percent is matched.
- ❑ Approved withdrawal of approval for Polk County erosion and sedimentation control local program since the Polk County Board of Commissioners rescinded the county ordinance before it became effective.
- ❑ Acknowledged Jim Simons, Director, Division of Land Resources, for serving the division for 32 years as of February 16, 2005.

Note: All approved local program contract monies are subject to availability of appropriated funds.

NC Division of Land Resources Land Quality Section Selected Activities Report (All Regions) July to December 2004

Erosion and Sedimentation Control Program

New Projects	1,563
Sedimentation Plan Reviews	2,208
Plan Disapprovals	499
Site Inspections	7,703
Notice of Violations	317
Cases Referred to Enforcement	39

Mining Program

Estimated Mine Total	933
Mine Permits Reviewed	146
Mine Inspections	300

Dam Safety Program

Estimated Dam Total	4,653
Dam Safety Plans Reviewed	51
Dam Inspections	1045



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SEDIMENTS is published quarterly by the NC Sedimentation Control Commission to provide information and assistance to the regulated community and to facilitate communication among personnel of state and local erosion and sedimentation control programs.

Send comments to Janet Paith, CPESC, NCDENR-Land Quality, 1612 Mail Service Center, Raleigh, NC 27699-1612. Email: Janet.Paith@ncmail.net. Send change of address and subscription information to WRRI, Box 7912, North Carolina State University, Raleigh, NC 27695-7912 (919)515-2815; water_resources@ncsu.edu). Fifty-seven hundred copies of this newsletter were printed at a cost of \$1,340 or 23 cents per copy.

Personnel of the Land Quality Section of the NC Department of Environment and Natural Resources provide information and assistance for implementation of the NC Erosion and Sedimentation Control Program. For assistance, please contact the Regional Engineer or the Raleigh headquarters listed below:

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The North Carolina
Sedimentation Control Commission

The Sedimentation Control Commission (SCC) was created to administer the Sedimentation Control Program pursuant to the NC Sedimentation Pollution Control Act of 1973 (SPCA). It is charged with adopting rules, setting standards, and providing guidance for implementation of the Act. The composition of the Commission is set by statute to encompass a broad range of perspectives and expertise in areas related to construction, industry, government, and natural resource conservation and quality. All members are appointed by the Governor and serve three-year terms, except for the Director of the Water Resources Research Institute of The University of North Carolina, who serves as long as he remains Director. The chairman of the SCC is named by the Governor. The following is a list of current members with the organizations they represent:

Chairman:
Kyle Sonnenberg
Fayetteville

NC League of Municipalities/
NC Association of County Commissioners

Vice Chairman:
Ralph Stout
Greensboro
Carolinas Associated General Contractors

Commissioners:
Donnie W. Brewer
Greenville
NC Environmental Management Commission

W. T. "Buzz" Bryson
Raleigh
NC Public Utilities

Hugh J. Franklin
Marion
NC Mining Commission

Phillip Ray Gibson
Asheville
Non-governmental Conservation

Joseph H. Kleiss
Raleigh
NC State University Dept. of Soil Science

Grover McPherson
Winston-Salem
NC Soil and Water Conservation Commission

Director of Water Resources Research Institute of
The University of North Carolina

Joseph Rudek
Raleigh
Non-governmental Conservation

Mark A. Taylor
Greensboro
Professional Engineers of NC

F. Roger Watson
Asheville
NC Home Builders Association

Local Programs Workshop Well Attended

This year the weather cooperated to allow the Local Programs Workshop to meet as scheduled on February 2 & 3, 2005, at the Mid-Pines Inn in Southern Pines, NC. The conference room was packed with representatives from 37 of 46 erosion and sedimentation control local programs statewide, as well as representatives from the Divisions of Land Resources and Water Quality. There were 105 in attendance.

A great deal of interaction was incorporated into the agenda to allow for better exchange of ideas and perspectives concerning various aspects of sediment and erosion control at the local level.

Matt Flynn of the Town of Cary and Dean Parker of Gaston County gave presentations on how their local programs manage the data generated from erosion and sedimentation control plan submittals and site inspections. Their presentations sparked discussion on *Holly White is in charge of the local program in the Town of Kitty Hawk.*



Tony Johnson (right) of Cabarrus County local program shares his points on assessing civil penalties to the local programs panel and audience. From left: Robert Gordon, Gaston County; Earl Davis, Guilford County; and Byron Brady, Wake County.

Greg Greene of Rowan County and Tommy Burlison of Avery County talk during a break.

the use of erosion and sedimentation control single family home development inspection sheets in relation to database management. Mary Robinson of the Town of Southern Pines shared about their local program being in the center of a golf community and provided information on some of their recent erosion control projects. Brian Sullivan of the City of High Point discussed the use of baffles in sediment pits and basins.

Gray Hauser, state sediment specialist, gave a virtual tour of an erosion control inspection with actual video footage of a construction site. Allison Davidson's (Asheville Regional Office) presentation, "Preparing the Enforcement Case," was well received. Much interest was shown in the mock trial conducted by Mary Penny Thompson, assistant general counsel for the Department of Environment and Natural Resources. Local programs staff were given pointers on testifying in court for an erosion and sedimentation control violation. The workshop closed with the Local Programs Awards Luncheon (see page 3). As always, the workshop was well received by the participants—many of them look forward to next year's workshop. The presentations may be viewed at <http://www.ncsu.edu/wrri/events/localprograms/>.

Watauga and Gaston Counties Win Local Programs Awards

Watauga and Gaston County Erosion and Sedimentation Control Local Programs were presented with awards of excellence in erosion and sedimentation control at the Awards Luncheon on February 3, 2005, at the Mid-Pines Inn in Southern Pines, NC. The keynote speaker, W.T. "Buzz" Bryson, Sedimentation Control Commission member, encouraged the local programs to continue striving for excellence in erosion and sedimentation control. Local Program Awards are given in two categories: (1) programs devoting resources of up to 3 man-years of support and (2) programs devoting resources of more than 3 man-years of support.

Watauga County received the Local Programs Award of Excellence for a program with a staff of fewer than three people. Established in 1975, the Watauga County erosion and sedimentation control program is located within the county's planning and inspections department in downtown Boone. Matt Gantt, regional engineer in the Winston-Salem Regional Office, nominated Watauga County for the award, stating that the local program "maintains outstanding working relationships with the Land Quality Section, the US Army Corps of Engineers, NC Wildlife Resources, and the NC Division of Water Quality. Jimmy Warren and Randy Woodrow manage the county's program.

Since 1980, the population of Watauga County has increased almost 30 percent which explains the increase in housing and construction projects. The local program has developed a brochure entitled "Controlling Sediment on Job Sites" which is included with all building permits, including single family home sites that are less than one acre in size. They review all building permits for erosion control and flood plain compliance. In 2004, they reviewed 837 building permit applications in 2004—an increase of 35 percent over the past 10 years with no increase in staff. Warren and Woodrow have worked together

to develop a stringent permit review process for the county. They encourage on-site meetings before sites are developed to discuss the required permits and possible environmental impacts. Legal action has not been needed to obtain compliance with the ordinance since they withhold the building permit or final plat approval until the site meets erosion and sedimentation control standards. During the recent floods, they worked with the emergency management staff and the NC National Guard to rescue

individuals impacted by the floods. They also assisted the NC Forest Service bridge crew in constructing temporary bridges to allow access to impacted properties. You may view their web site at <http://www.wataugacounty.org> (go to Planning and Inspections Department).

Gaston County received the Local Programs Award of Excellence for a program of more than three staff members. Established in April 2003, this local program is the only one in North Carolina that is also a soil and water conservation district. Doug Miller, regional engineer in the Mooresville Regional Office, nominated Gaston County for the innovations they have done since the implementation of the program. Seventy percent of their land-disturbing activity is residential, and thirty percent is commercial.

When Gaston County was looking at the possibility of taking on an erosion and sedimentation control local program, they spent time observing and asking questions of Tony Johnson and Thomas Smith, local program staff in Cabarrus County. One of the technologies Gaston County uses daily to carry out their erosion and sedimentation control duties is their database system which has all the information on all their active projects. Gaston County adopted the database format that Cabarrus County Local Program uses and made changes to fit their own needs. All the information a developer needs to submit an erosion and sedimentation control plan is



Watauga County Local Program staff, Randy Woodrow, (second from left) property development coordinator I, and Jimmy Warren (third from left), property development coordinator II, receive the Local Programs Award (fewer than three staff members) from the NC Sedimentation Control Commission (SCC) members, W.T. "Buzz" Bryson (left) and Ralph Stout (right). Joseph Furman is director of Watauga County Planning and Inspections Department (not pictured).



Helena Smith (first row second from left), conservation assistant, receives the Local Programs Award (more than three staff members) from the NC SCC members, W.T. "Buzz" Bryson (first row left) and Ralph Stout (first row, third from left) on behalf of the Gaston County Local Program. Also pictured are Roger Hurst (first row, right), Gaston County Soil and Water Conservation District Board member; Second row, from left: Robert Gordon, natural resources engineer; Danon Lawson and Joseph Alm, natural resource conservationists; and Dean Parker, natural resource conservationist and local program administrator. Other staff include David Freeman, director, Natural Resources Conservation Department, and Jonathan Holley and Jason Cathey, natural resource conservationists (not pictured).

Awards *continued*

available on the Gaston County web site—<http://www.co.gaston.nc.us>—including the erosion and sedimentation control ordinance and application forms. Project and plan statistics are sorted by month—information from their database—is also available on their web site. The staff makes a practice of having presubmission conferences before a party submits an erosion control plan. They remain in close contact with the developer and contractor thereafter as they visit every active site twice a month. The staff also maintains open communication with Doug Miller, regional engineer, Steve Allred, assistant engineer, and Gene Owens, inspector, all in the Mooresville Regional Office. Since 70 percent of their complaints are from land-disturbing activity of less than an acre, they are proactively responding by instituting a less than one acre lot form which is to be implemented in 2005. With agriculture becoming less of a commodity, and erosion and sedimentation control becoming a greater issue with more development pressure coming from urban growth, Gaston County has done a successful job with their local program while maintaining their Soil and Water Conservation duties.

Congratulations to both programs for doing an outstanding service in erosion and sedimentation control. Nominations will be accepted for the 2006 Local Programs Awards this fall.

Mountain *continued*

discharge for the smaller storms—a great situation when it occurs!

Stables Site

The Stables and associated pasture encompassed five acres of clearing adjacent to Cashie Branch. All of the site was graded to drain away from the creek and into a 4,000 cubic foot sediment basin. McLaughlin used a flashboard riser outlet, installed in March 2003, to allow the formation of a permanent pool but retaining the ability to drain the basin if needed to remove sediment.

This site went through a typical series of runoff events in which the first events after clearing and grading had high sediment loads but as the site became more stabilized the runoff water quality improved greatly. The primary sediment

basin appeared to function much better when the rock checks and porous baffles were added. The attempts to reduce turbidity by introducing polyacrylamide (PAM) logs in the ditches were not successful because the logs tended to either get buried under sediment or dry out and become inactive. There is evidence that PAM logs were somewhat effective in the flashboard riser barrel, where they remained moist and did not accumulate sediment.

Practice Range Site

The Practice Range site, approximately 20 acres, was cleared in summer 2002. Runoff coming on to the site was redirected into drainage pipes



Practice Range Basin 1 in June 2004. Note the deposition of sediment behind the baffles, particularly the second baffle after the first one was overtopped.

to a point below the cleared area. A number of temporary sediment traps were placed around the site during the initial grading. The final design consisted of three basins (B1, B2, and B3), one emptying into the next prior to exiting the site near Sugarloaf Creek. Automatic samplers were placed at the entrance of B1, at the exit of B1 (entrance to B2) and at the exit of B3, along with several single stage samplers.

The first challenge was the inlet channel into B1, which collected runoff from the disturbed area above the basins. It emptied into the basin near the outlet, allowing the runoff to directly exit the basin with no settling time for the sediment. Silt fence and coir log diversions were installed to guide the water towards the front of the basin to allow full use of the basin and two jute/coir baffles. The outlet for B1 was

a flashboard riser leading into B2 which also contained two jute/coir baffles. The final basin, B3, had one baffle. Two manufactured channel check dams, GeoRidge (Nilex, Inc.) and Triangular Silt Dike (Triangular Silt Dike Company, Inc.) were placed in the channel leading into B1, while geotextile material was used under the rocks in the spillway between B1 and B2. PAM logs (APS 706) were placed in the flashboard riser to treat the turbid water as it passed into B2.

On July 25, 2004, the area received more than six inches of rain in approximately eight hours. As the channel leading into B1 eroded, the sampler and rain gauge were washed out, not collecting any entrance samples. The first

basin filled with sediment, burying the baffles, while B2 also filled with sediment to the top of the baffles (approximately three feet high). Much of the rock in the spillway between B1 and B2 was displaced but the underlying geotextile material prevented additional erosion from occurring. The sampler at the exit of the site below B3 recorded turbidities of 80–260 NTU (Nephelometric Turbidity Units), suggesting the majority of the eroded sediment was kept on site. Following this event, site maintenance included digging out the

deposited sediment, constructing a new channel which was re-routed to enter B1 at the front end (furthest away from the outlet), and replacing baffles.

Through fall 2004, the site continued to have grading on the middle to upper slopes. Most of the runoff was still being directed into the first basin using the diversion ditch. However, this ditch had eroded badly due to the heavy rains from the hurricanes in September 2004, and was probably the source of much of the sediment filling the first basin. McLaughlin recommended that this ditch be reworked and lined with geotextile since it appears it will be in place for some time to come.

A previous article about this project may be seen in SEDIMENTS Vol. 10, No. 4, October-December 2003.

Personnel Changes

Janet Boyer is the new regional engineer in the Asheville Regional Office.

Julie Dorr is the new environmental technician in the Fayetteville Regional Office.

Gerald Lee has retired as regional engineer from the Fayetteville Regional Office.

Karyn Pagau is the new assistant regional engineer in the Raleigh Regional Office.

Clif Whitfield is the new environmental technician in the Winston-Salem Regional Office.

CPSWQ Review Course & Exam

The Certified Professional in Storm Water Quality (CPSWQ) Program builds on skills associated with NPDES rules and regulations, Site Planning, Watershed Hydrology, Quantification, Erosion & Sediment Control, Water Quality BMPs and BMP design & selection. To pursue the CPSWQ, a candidate must apply through the Certified Professionals website (www.cpesc.org).

CPSWQ Exam Review Course: June 13, 2005
Sediment and Erosion Control
Field Research and Education Facility (SECREF)
Lake Wheeler Road, Raleigh, NC

The cost is \$90 and seating is limited. All CPSWQ Exam Review Workbooks can be obtained from the Certified Professionals web site (www.cpesc.org). Registration information is available at: http://www.doh.dot.state.nc.us/operations/dp_chief_eng/roadside/fieldops/

Clean Water, Healthy Streams, Strong Communities

Joint Southeastern Stormwater Management & Erosion and Sediment Control Conference

October 2-6, 2005

Wyndham Peachtree Conference Center
Peachtree City, Georgia

The Joint Southeastern Stormwater and Erosion Control Conference combines the Southeastern Stormwater Management Conference and the Southeast Chapter of the International Erosion Control Association Annual Conference into one information-filled meeting for educators, agency personnel and practitioners. It is a forum to address specific issues facing the Southeastern US and to share successful programs and strategies to reduce non-point source pollution. The conference will be held at the Wyndham Peachtree Conference Center, a natural oasis located 30 minutes from downtown Atlanta in Peachtree City, a master planned community with a strong conservation ethic.

More information at:

<http://www.ieca.org/Chapter/southeast/southeasthome.asp>

ADDRESS SERVICE REQUESTED

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