NCDOT Highway Stormwater PROGRAM

BMP Retrofits Program

DOT's NPDES Permit at Part II.B.2

Bioretention basin retrofit installed at a rest area off of I-40 near Warsaw.

Program Objectives

Objectives established by DOT's Permit at Part II.B.2

- Develop, implement and support the DOT program to be consistent with NPDES post-construction control measures
- Use Retrofits to address pollutant loading from existing DOT activities.
- Retrofits should not be associated with meeting the requirements of any other DWQ program.

Retrofits Implemented to Address Pollutants of Concern

Through its Retrofit Program, DOT has identified over 70 sites for Year 3 to address potential pollutant loads from DOT roadway facilities and industrial activities (Management Measure a), which are suitable for the construction of a best management practice (BMP) also known as a stormwater control (SC).

During the first three years of this permit term, DOT has implemented 43 retrofits (or 45 credits) to address the pollutants of concern. An additional 26 retrofits are currently active or in progress (Management Measure b). Conventional retrofit types implemented to date include dry and wet detention ponds, bioretention basins, sand filtration basins, infiltration basins, grassed swales, stormwater wetlands, catch basin inserts, level spreaders and hazardous spill basins. A hydrodynamic vortex separator is currently in use at Cumberland County Maintenance Yard; research on this innovative technology retrofit is being coordinated through DOT's Research Program.

Support of other DOT Activities

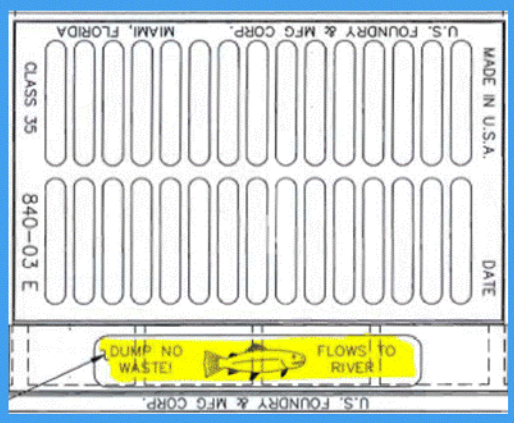
In addition to objectives listed under Part II.B.2, the BMP Retrofits Program supports other programs and activities of DOT associated with stormwater, such as:

- ***BMP Toolbox Program**—Incorporate lessons learned through the implementation of innovative design procedures and methods into the BMP Toolbox as design standards.*
- ***Construction Manual**—Solicit feedback about construction concerns to improve future design efforts.*
- ***Inspection and Maintenance Program**—Gather information about BMP maintenance concerns to improve future design efforts.*
- ***Education Program**—Use retrofits as demonstrations for education purposes.*
- ***Research Program**—Perform research on retrofits to confirm their effectiveness.*

Filtration Basins in McDowell Creek Watershed

Filtration basin BMPs were installed to assist Mecklenburg County with implementation of the McDowell Creek Watershed Management Plan (see photo at right). Water quality concerns for McDowell Creek include biological impairment on NCDENR's 303(d) list and potential contamination of downstream drinking water sources. The two basins operate in series and were strategically located to mitigate significant erosion occurring in an existing roadside ditch. Construction presented many challenges, including erosion of side slopes, embankment failures, and sediment buildup on the filter areas, all due to large rain events. In addition, an embankment failure occurred after construction that was attributed to inadequate materials and compaction. Lessons learned from implementation of the BMPs will be beneficial for future design and construction efforts.

Two Filtration Basins in series located near Charlotte off of I-77.



DOT's standard drop inlet grate has been retrofitted with a fish logo as a non-structural BMP.

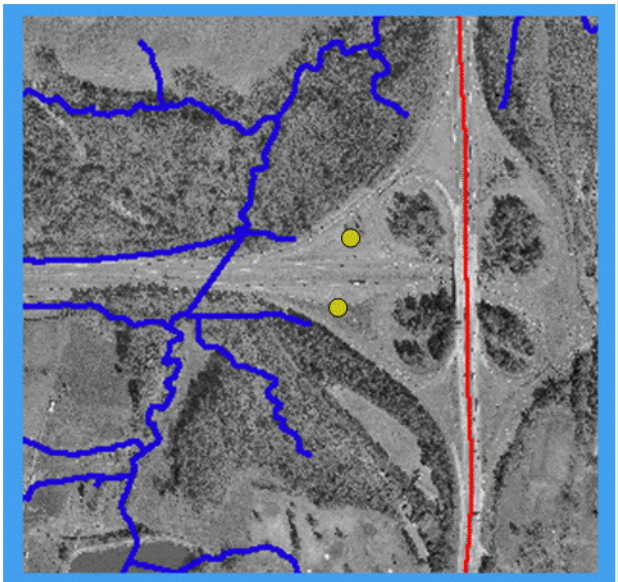
Non-structural BMP Retrofits

Non-structural BMPs are practices that prevent the contact of stormwater with pollutants and control the source of pollution. In Year 3 of the permit term, DOT changed its design standard for drop inlet grates (shown in picture at left) to increase awareness that most storm drains discharge directly to rivers and creeks. Grates with the logo have already been installed on some DOT projects, and all future projects are expected to utilize grates with logos.

Where possible, BMPs are designed to benefit multiple programs, such as the Pet Waste Stations, implemented in over 70 rest areas, which are also a part of the Public Education Program. Other examples of non-structural retrofits include vegetated buffers, and street sweeping.

Retrofit and Research Programs

Potential retrofits along Wade Avenue in Raleigh, NC provide an example of interaction between the BMP Retrofits Program and the Research Program. The locations of the retrofits are shown in the aerial photo to the right as yellow circles; drainage ways are shown as blue lines. This joint effort between DOT and NCSU will assess the effectiveness of certain retrofits to treat stormwater runoff by monitoring storm water quality before and after the implementation of BMPs. The retrofits will include installation of a dry detention basin, conversion of a drainage swale to a filtration basin, and the addition of soil amendments to improve hydraulic conductivity. Lessons learned from the project can be utilized to refine future BMP selection and design efforts.



Aerial photo and location of linear wetlands along Wade Avenue in Raleigh, NC Photo courtesy of NCSU.

For more information about DOT's BMP Retrofits Program

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