CSRWG June 16 2008
White

MEMO

TO: Mr. George Givens
FROM: Nancy White

DATE: June 12, 2008

Mr. Givens: Several participants in the Coastal Stormwater Rules Working Group asked for me to submit my comments in writing. I have listed them below.

1) Storm event driven, fecal indicator bacteria loading rates have been found to be consistently higher than recommended for SA waters for all land uses. Urban watersheds are highest however, with loading rates exceeding millions of cells (expressed as MPN or most probable number), per acre, per year. A TMDL study conducted as part of a USDA funded research effort found that even a 99% reduction in fecal loading rate would be reclassify a affected closed shellfish bed as open.

2) Storm event driven bacterial loading rates are not well correlated with density or extent of impervious surfaces. Fecal indicator bacterial levels were developed for and applied as an extrinsic surrogate of public health threat. They are not good mechanist explanatory variable of a watershed or drainage's areas potential to impact water quality in the receiving water body. Our research found good water quality and pre-development bacterial loading rates in a watershed with high levels of imperviousness (exceeding 24%) which had been mitigated using innovative conservation and hydrologic mitigation techniques (some of which would not be permittable under these regulations) and poor water quality and high bacterial loading rates in watersheds with less than 12% imperviousness and extensive buffers.

3) Comparative studies of various land uses and their impacts on water quality show that developed areas (both urban and farm) have consistently higher loading rates of all pollutants into the receiving water body than forested, non-disturbed areas.

4) Fecal indicator bacteria loading rates has been found to be significantly correlated with rainfall rates, septic tank density, and ditching density. In studies tracking the sources for the bacteria, some human signature was found, but at very low levels and not definitively linked to septic tanks; so while septic tanks are an issue of some concern, there is more that needs to be studied before they are exonerated or implicated.

5) Coastal hydrology is complex and has been made moreso by the ditching and draining initiated with forestry and farming activities at the turn of the century, continued with each succeeding land use change. This complex interaction of surface and ground water, wind driven tides and storm event flows make effective management a challenge without extensive knowledge of local conditions.

Relevant Citations:

Line, D.E., N.M. White, W.W. Kirby Smith and J.D. Potts, 2008. Fecal Coliform Export from Four Coastal North Carolina Areas. Journal of American Water Resources (JAWRA) 44(3): 606-617.

Line, D.E. and N.M. White. 2006. Effects of Development on Runoff and Pollutant Export. /Water Environment Research/ 79(2):185-190.

CSRWG June 16 2008
White

Kirby-Smith William and NM White. 2005. Bacterial Contamination Associated with Estuarine Shoreline Development. Journal of Applied Microbiology. JAM-2005-0127.R1.

Berke, Philip R., Joe McDonald, Nancy M. White, Dan Line, Michael Holmes, Kat Oury, Rhonda Ryznar. 2003. "Greening Development to Protect Watersheds: Is New Urbanism the Answer?" Journal of American Planning Association, V69, #4, pps 397-413.

Line, D. E., NM White, DL Osmond, Gregory Jennings and Carolyn Mojonnier. 2002. Pollutant Export from Various Land Uses in the Upper Neuse River Basin, Water Environment Research, V74, #1.

Line, D.E. and N. M. White. 2001. Efficiencies of Temporary Sediment Traps on Two North Carolina Construction Sites. TRANS of the ASAE 44(5): 1207-1215.

White, Nancy M., Daniel E. Line, JD Potts, William Kirby-Smith, Barbara Doll and W.F. Hunt. 1999. Jump Run Creek shellfish restoration project. Journal of Shellfish Research, Vol. 19, No.1., 473-476, 2000.

White, Nancy, Michael Holmes, and Leon Danielson. 1999. Development of land use change indicators to support watershed based restoration of shellfish resources impacted by fecal coliform contamination. In: Proc., International Conference on Shellfish Restoration, Cork, Ireland, October 1999.