Report to the Town of Chapel Hill
from the
Technical Advisory Committee
on the
Town of Chapel Hill Land Use Management Ordinance,
Stream Definitions and Verification Criteria

Recommendations for Revisions in Stream Definitions and Field Verification Methods

Part II – Additional Guidance on the Recommendations

August 12, 2003

Introduction

This report is a follow up to the report of the Technical Advisory Committee, dated June 5, 2003. Many of the recommendations in the first report suggested changes in definitions or policy without providing specific suggestions on the substance of those changes. This report provides additional recommendations on revised definitions and policy issues. The recommendations in the first report are repeated below and specific additional guidance on certain of those recommendations follows.

Summary of Recommendations

1. Revise definitions in the Land Use Management Ordinance.
   A. Adopt the definitions of channel, streams, modified streams, and ditch contained in the North Carolina water quality rule: Neuse River Basin: Nutrient Sensitive Waters Management Strategy: Protection and Maintenance of Existing Riparian Buffers.
   B. Delete the definition for 'stream channel'.
   C. Add the definition of 'normal rainfall'.
   D. Delete the definition of 'normal flow'.
   E. Delete the definition of 'perennial surface waters'.
   F. Revise the definition of 'perennial water body'.
   G. Delete the definitions of 'stream buffer' and 'watershed buffer' and add a more general definition of 'riparian buffer' that covers all instances of regulated riparian zones.
   H. Revise the definition of 'stream bank'.
   I. Revise the definition of 'water course' for completeness and consistency with the new or revised definitions noted above.
   J. Revise the definition of 'surface water' for completeness and consistency with the new or revised definitions above.

2. Delete the references to maps that are in some of the current definitions of types of surface waters and add a paragraph on applicability of the Resource Conservation District rules in section 3.6.3(a) that refers to use of maps combined with field evaluation methods to determine the presence of regulated surface waters.

3. Intermittent Stream Field Evaluation Method: Adopt the current version of the NC Division of Water Quality (NCDWQ) Stream Classification Method for field evaluation of intermittent streams with a minimum score of 19 points.

4. Perennial Stream Field Evaluation Method: Adopt the following two part method:
   A. Use the current version of the NCDWQ Stream Classification Method with a minimum score of 30 points to make a tentative determination of the stream origin and type.
   B. Conduct a survey of macroinvertebrate organisms in the vicinity of the tentative stream origin to determine the presence and relative abundance of biological indicators of perennial flow.

5. Include specific policies on stream evaluations for streams or stream reaches that appear to be functioning lotic (flowing aquatic) systems but are natural variants that may not precisely

fit the appropriate stream type definition or may not meet the minimum criteria for the appropriate stream type.

6. Include specific policies on stream evaluation for streams that have been significantly altered or degraded due to urbanization or other anthropogenic impacts.

7. Identify and refer to the stream origin field verification procedures in the Land Use Management Ordinance but do not include the detailed procedures in the ordinance.

8. Implement an appeals procedure for contested stream evaluations that utilizes environmental professionals who are knowledgeable and experienced in stream evaluation.

9. Implement a policy for the length of time for which a particular stream evaluation stands for regulatory purposes.

10. Implement a policy that allows for re-evaluation of stream origins that were determined prior to the enactment of the current Land Use Management Ordinance on January 27, 2003 and the stream definitions and stream origin determination methods in current use for that ordinance.

Additional Guidance on Recommendations

1. Recommendation 1A – Add the definition of 'normal rainfall: *'Normal rainfall' is the 30-year average rainfall, updated each decade to the most recent 30-year period by the National Climatic Data Center.*

2. Recommendation 1F – Revise the definition of 'perennial water body'. This recommendation relates to the portion of the definition that states "*connected by surface flow to a stream"*. The definition emulates that in the Neuse Riparian Buffer rules; however, NCDWQ interprets "connected by surface flow" as connection via an intermittent or perennial stream. Therefore, ponds that are isolated from the stream network except for occasional stormwater outflow are not subject to the buffer rule. The suggested change in the Chapel Hill definition clarifies that policy. Note the suggestion to use 'channel' rather than 'stream' to provide the flexibility to include man-made ponds with ditch connections to a stream when those ditches are functioning like a stream. Revised definition: *"Perennial water body" is a natural or man-made basin that stores surface water permanently at depths sufficient to preclude growth of rooted plants, including lakes, ponds, and similar water features. For the purposes of this Section, the surface waters must be part of a natural drainageway (i.e. connected to a stream by a channel with intermittent or perennial flow). Perennial water bodies shall be those delineated on the Town's Aerial Topographic Maps, subject to field verification.*

3. Recommendation 1G -- delete the definitions of 'stream buffer' and 'watershed buffer' and replace them with a more general definition of 'riparian buffer' that covers all instances of regulated riparian zones. It is also recommended that the term "stream corridor zone" be replaced with "riparian buffer". That again promotes consistency with the river basin buffer rules where a buffer with several zones is specified and also eliminates the use of "stream

corridor zone" when applying the riparian buffer guidelines to a perennial water body. The term "corridor zone" of Table 3.6.3-1 should then be changed to "Riparian buffer zone". In Article 3.6.4(f), change 'stream buffer' to 'riparian buffer'. The last sentence in that section can also be deleted since the definition of 'riparian buffer' includes the specification for measurement. Recommended definition: *'Riparian buffer' is a natural or vegetated area adjacent to streams and perennial water bodies through which stormwater flows in a diffuse manner, so that runoff does not become channelized and which provides for the infiltration of runoff and filtering of pollutants. The riparian buffer is measured landward (horizontal distance) from the stream bank on both sides of the stream or from the normal pool elevation of a perennial water body. The riparian buffer shall also "wrap around" the upstream end of the stream origin.*

4. Recommendation 1H – Revise the definition of "stream bank": *'Stream bank' is the point on a stream's cross-section defined by the bankfull elevation.* Note that bankfull elevation is the top elevation of the current active channel. For severely incised streams that are forming a new active floodplain down inside the relic channel, the measurement for the width of a riparian buffer may start down inside the relic channel at the top of a point bar or a bankfull bench. That interpretation of bankfull elevation or bank top of the current active channel is consistent with the NCDWQ approach to the measurement point for river basin buffers.

5. Recommendation 1I – Revise the definition of 'water course' for completeness and consistency with the new or revised definitions noted above: *'Watercourse' is any natural or man-made conveyance of concentrated surface flow including: (1) any area of a perennial stream or regulatory flood plain which is inundated during the base flood discharge, (2) any intermittent or perennial stream, (3) any ephemeral stream or ditch that frequently transports stormflow, or (4) any perennial water body.* The philosophy of this definition is meant to reflect the use of the term 'water course' in the ordnance, basically any conveyance of concentrated surface flow or ponded water.

6. Recommendation 1J -- Revise the definition of 'surface water' for completeness and consistency with the new or revised definitions above: *'Surface water' is any intermittent or perennial stream or modified stream or any perennial water body as defined herein.*

7. Recommendation 2 -- Delete the references to maps that are in some of the current definitions of types of surface waters (intermittent stream, perennial stream, and perennial water body) and add a paragraph on applicability of the Resource Conservation District rules in Article 3.6.3 that refers to use of maps combined with field evaluation methods to determine the presence of regulated surface waters. Recommended addition to Article 3.6.3(b): *Streams subject to the provisions of this Article and Article 3.6.4 include those shown on the Town's Geographic Information System (GIS) Coverage, the most recent version of the US Geological Survey 1:24,000 scale (7.5 minute) topographic map, or the soils map in the US Department of Agriculture Orange County Soil Survey subject to field determination by the Engineering Department. <u>Procedures for Field Determination of Streams</u> shall be those recommended by an expert Technical Advisory Committee (appointed by the Town Manager) and approved by the Council. Perennial water bodies subject to the provisions of this Article shall be those delineated on the Town's Aerial Photographic Maps,*

subject to field verification by the Engineering Department. Note the recommendation that the field evaluation procedures not be included in the ordinance. That provides the flexibility to revise and improve the procedures as experience in their use is gained by the Engineering Department and when new research results indicate the need for changes.

8. Recommendation 5 -- Include specific policies on stream evaluations for streams or stream reaches that appear to be functioning lotic (flowing aquatic) systems but are natural variants that may not precisely fit the appropriate stream type definition or may not meet the minimum criteria for the appropriate stream type. It is recommended that this issue be addressed in the introductory section of the Procedures for Field Determination of Streams. Recommended verbiage follows. *Due to the broad variability in the natural characteristics of small streams, there are a number of types of stream segments, at the origin or downstream of the origin, that do not fit the stream determination criteria, yet are a functioning component of the stream network. Such segments shall be included as part of the stream that is subject to the provisions of the Land Use Management Ordinance. Common examples include:*
    a. *Small streams fed by springs or large slope wetlands that have perennial or near perennial flow, have biological indicators of perennial flow, but score below the minimum score on the stream determination due to a poorly developed channel.*
    b. *Stream segments in which base flow occurs underground and a poorly developed channel results in a low score on the stream determination. Where such segments connect segments that clearly meet the criteria for intermittent or perennial stream, the stream shall be considered to be continuous through that segment.*
    c. *Streams that discharge into a flood plain and the channel seems to stop at that point because base flow occurs underground in the sediments of the floodplain and stormflow occurs as dispersed flow across the floodplain. Such segments are still a functioning component of the stream and the stream shall be considered to be continuous to the stream to which it discharges.*

9. Recommendation 6 -- Include specific policies on stream evaluation for streams that have been significantly altered or degraded due to urbanization or other anthropogenic impacts. It is recommended that this issue be addressed in the introductory section of the Procedures for Field Determination of Streams. Recommended verbiage follows. *The impacts of urbanization results in alteration or degradation of streams to the extent that the stream often does not meet the criteria of the appropriate field determination procedure. In such cases, the best professional judgment of the Engineering Department shall be applied and the preponderance of the evidence shall be applied to making a stream determination. Common examples include:*
    a. *Well developed stream channels that appear to be perennial streams, but benthic macroinvertebrate indicators are lacking due to accelerated channel erosion and scouring or degraded water quality.*
    b. *Geologically very young intermittent stream segments that have formed due to greatly increased stormflow or where headcuts have moved rapidly upslope. Such streams often have deeply incised channels with soil indicators of frequent, continuous flow, but lack many of the geomorphic indicators (riffle and pool*

systems, benches or bars, etc.) and many of the biological indicators of natural streams.

c. *Stream origins located at stormwater outlets where greatly increased stormflow has produced a stream channel where a stream was not previously present. Often, such stream segments clearly exhibit the characteristics of intermittent or perennial streams but are not shown on maps.*

10. Recommendation 8 -- Implement an appeals procedure for contested stream determinations that utilizes environmental professionals who are knowledgeable and experienced in stream evaluation. It is recommended that the following provisions be included:
    a. The stream determination procedures shall include two levels of appeal from decisions made by the Engineering Department: (1) appeals board, (2) Town Council
    b. Town manager appoint a pool of knowledgeable and experienced individuals to an appeals board or committee selected in accordance with criteria established by the Council.
    c. When a landowner or landowner's agent disagrees with a stream determination made by the Engineering Department, the Town Manager or his/her representative obtain the services of at least two members of the appeals board, one of whom is an expert on benthic macroinvertebrates to review the determination.
    d. When members of the appeals board conduct a stream determination review, they shall be paid a reasonable consulting fee, which fee shall be paid by the landowner or agent who requested the stream determination review.

11. Recommendation 9 -- Implement a policy for the length of time for which a particular stream determination stands for regulatory purposes. It is recommended that stream determinations be valid for 5 years unless development in the catchment of the stream results in significant alteration.