A RESOLUTION ADOPTING A STATEMENT EXPLAINING THE BOARD OF ALDERMEN'S REASONS FOR ADOPTING AN AMENDMENT TO THE TEXT OF THE CARRBORO LAND USE ORDINANCE
Draft Resolution No.190/2011-12

WHEREAS, an amendment to the text of the Carrboro Land Use Ordinance has been proposed, which amendment is described or identified as follows: AN ORDINANCE TO ESTABLISH REQUIREMENTS LIMITING THE PERMISSIBLE VOLUME OF STORMWATER THAT RUNS OFF A DEVELOPED SITE

NOW, THEREFORE, The Board of Aldermen of the Town of Carrboro Resolves:

Section 1. The Town's Land Use Ordinance includes provisions for stormwater management which can provide additional protection for groundwater resources and the stability of stream channels with additional requirements to reduce the total volume of water running off of new developments via stormwater; and

Section 2. The Board concludes that the above described amendment is also consistent with Carrboro Vision 2020 regarding efforts to protect water resources, particular the following sections:

5.22 Carrboro should adopt a strategy and set of policies to protect all of our creeks, streams, ponds, and lakes.
5.23 Carrboro should be proactive in managing its stormwater, promoting active maintenance of facilities, reducing impacts of increased impervious surface, and minimizing impacts on waterways.

Section 3. The Board concludes that its adoption of the above described amendment is reasonable and in the public interest because the Town Seeks to remain consistent with its adopted plans or policies.

Section 4. The resolution is effective upon adoption.

This the 26th day of June, 2012

Ayes:
Noes:
Abstentions:

A RESOLUTION ADOPTING A STATEMENT EXPLAINING THE BOARD OF ALDERMEN'S REASONS FOR REJECTING AN AMENDMENT TO THE TEXT OF THE CARRBORO LAND USE ORDINANCE

Draft Resolution No.

WHEREAS, an amendment to the text of the Carrboro Land Use Ordinance has been proposed, which amendment is described or identified as follows: AN ORDINANCE TO ESTABLISH REQUIREMENTS LIMITING THE PERMISSIBLE VOLUME OF STORMWATER THAT RUNS OFF A DEVELOPED SITE; and

NOW, THEREFORE, the Board of Aldermen of the Town of Carrboro Resolves:

Section 1. The Board concludes that the above described amendment is not consistent with Town plans and policies.

Section 2. The Board concludes that its rejection of the above described amendment is reasonable and in the public interest because existing regulations are appropriate.

Section 3. This resolution becomes effective upon adoption.

This the _____ day of _____, 20__/

Ayes:
Noes:
Abstentions:

ATTACHMENT B

AN ORDINANCE AMENDING THE CARRBORO LAND USE ORDINANCE TO ESTABLISH REQUIREMENTS LIMITING THE PERMISSIBLE VOLUME OF STORMWATER THAT RUNS OFF A DEVELOPED SITE

THE BOARD OF ALDERMEN OF THE TOWN OF CARRBORO ORDAINS:

Section 1. Section 15-263 of the Carrboro Land Use Ordinance, entitled "Management of Stormwater," is amended by adding thereto a new Subsection (g1) to read as follows:

(g1) Developments shall install and maintain stormwater management systems such that the post-development total annual stormwater runoff volume shall not exceed the pre-development volume by more than the limits set forth in the following table. The pre-development and post-development annual stormwater runoff volume shall be calculated using the Jordan Lake Accounting Tool. A composite curve number shall be assigned to the development site in the pre-development stage using the runoff curve number method described in USDA NRCS Technical Release 55, Urban Hydrology for Small Watersheds (June, 1986). See also Chapters 4 through 10 of NEH-4, SCS (1985).

Preexisting Composite Curve Number *	Maximum allowable increase in annual stormwater runoff volume
>= 78	50%
70-78	100%
64-70	200%
<=64	400%

Section 2. All provisions of any town ordinance in conflict with this ordinance are repealed.

Section 3. This ordinance shall become effective upon adoption but shall not apply to projects with respect to which a complete application has been submitted and fees have been paid prior to the date of adoption.

TOWN OF CARRBORO

NORTH CAROLINA

TRANSMITTAL **PLANNING DEPARTMENT**

DELIVERED VIA: ☐ *HAND* ☐ *MAIL* ☐ *FAX* ☒ *EMAIL*

To: **David Andrews, Town Manager**
Mayor and Board of Aldermen

From: **Randy Dodd, Environmental Planner**

Date: **June 20, 2012**

Subject: **Draft LUO Text Amendment for Stormwater Volume Control for New Development**

Background and Summary

The Town's Land Use Ordinance (LUO) includes provisions for stormwater management to address peak runoff, water quality (as measured by total suspended solids), drawdown rates, and other stormwater management aspects. In addition, a public hearing is proposed for June 26th to consider an update to the ordinance to regulate nitrogen and phosphorus in stormwater runoff from new development as part of implementation of the Jordan Lake Rules. The LUO (current, and with proposed changes to address the Jordan Lake Rules requirements) does not include explicit provisions to regulate the total volume of stormwater runoff from a site. Increases in the total volume of runoff associated with new development results in currently unregulated environmental impacts such as decreased groundwater recharge and increased stream channel instability/erosion. Information is compiled in this memo to investigate the implications of regulating total stormwater runoff volume on new development as the basis for consideration of a new LUO requirement.

Information

Why is Total Stormwater Volume Control Important?

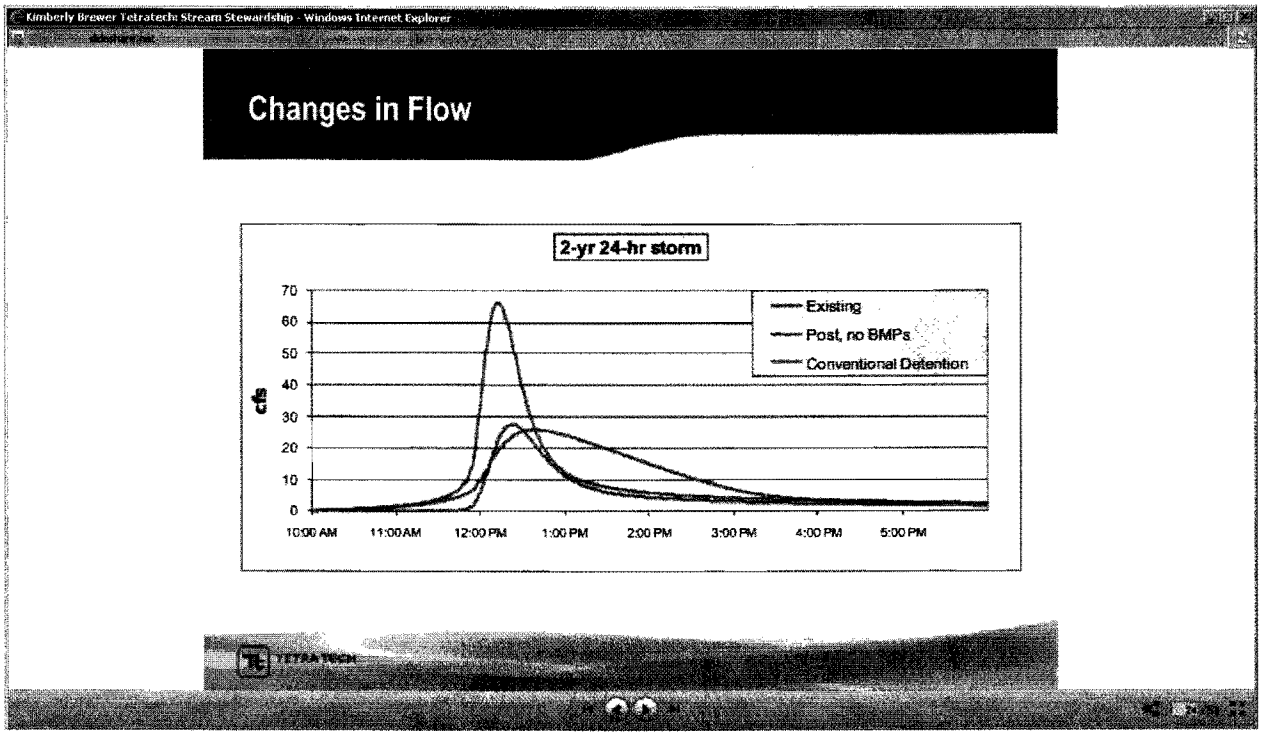
Attachment C-2

Both Bolin Creek and Morgan Creek have been recognized by the North Carolina Division of Water Quality as impaired. Multiple studies undertaken by the State and the Bolin Creek Watershed Restoration Team have identified stormwater quantity as a significant stressor to local creeks. Recent benthic macroinvertebrate monitoring undertaken by the Town has indicated that Bolin Creek remains stressed, with signs of additional stress associated with decreased baseflow.

Carrboro's current ordinance provisions address stormwater volume in that treatment of stormwater peak flow is required for the 1 through 25-year recurrence interval 24-hour design storms. In

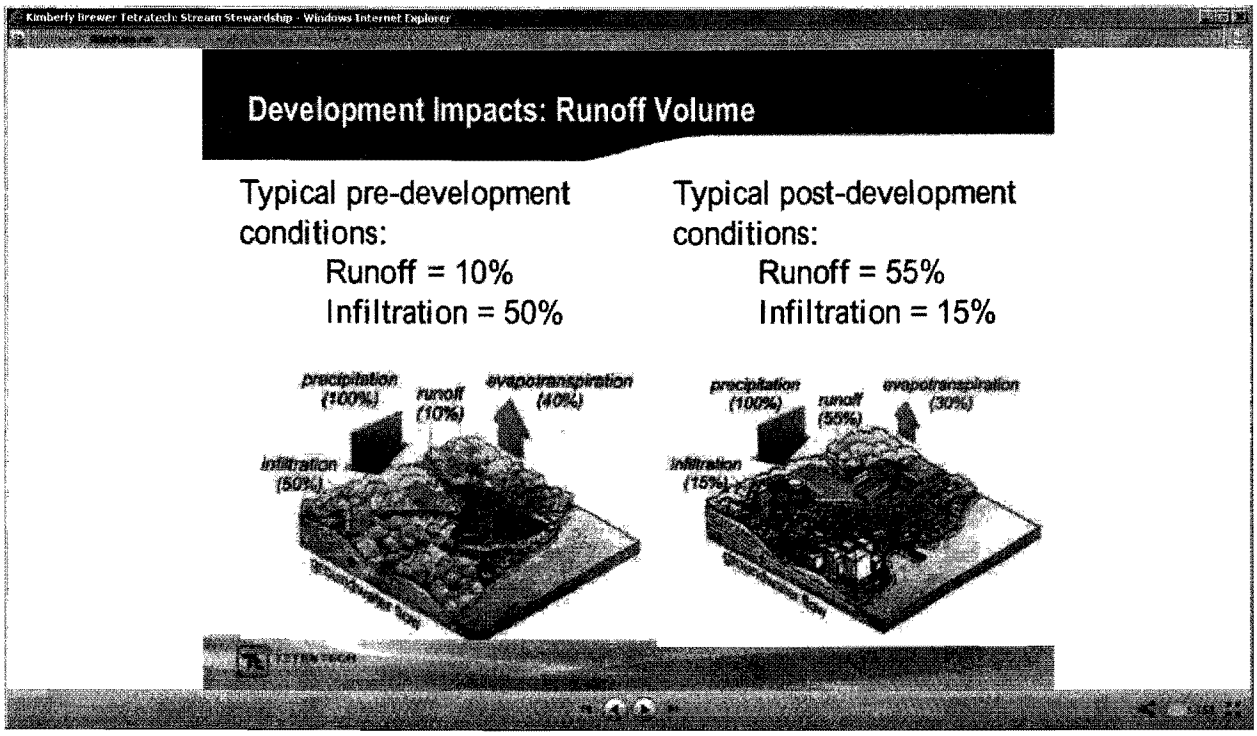
addition, water quality treatment is required for the first inch of rain during a storm event. Storm storage volume is required to be drawn down in 2 to 5 days after rain events to allow for capture of subsequent storms. These requirements provide water quantity control to minimize flooding and water quality treatment. However, these requirements do not fully mitigate stormwater impacts associated with decreases in groundwater recharge and increases in streambank erosion. As stormwater is released in the hours and several days after a storm event, this runoff is not available to replenish groundwater supplies. In addition, controlling volume for flood protection does not provide maximum protection for stream banks since the critical flow for protecting stream banks (at and approaching "bankfull" flow) is not explicitly regulated. Practices that do not intentionally address the total volume of stormwater generated can therefore result in impacts to stream channels from or more frequent flows at erosive levels. Figure 1 graphically indicates how peak flow can be maintained after development, but with a substantial increase in the total volume of runoff relative to pre-development.

Figure 1: Illustrative Pre and Post Hydrographs Indicating Runoff for Pre-Development and Post Development With and Without BMPs to address Peak Flow (Source: Kimberly Brewer, 2012 Local Creek Symposium at NC Botanical Garden)



A typical impact for a developing urban environment is illustrated in Figure 2. Historically, urban needs around transportation infrastructure and the built environment have resulted in dedication of significant portions of the landscape to intentionally impervious features. In addition, development can often compromise or reduce infiltration capacity through impacts on soil quality and permeability. In this typical scenario, the proportions of rainfall that runs off and infiltrates are essentially reversed before and after development.

Figure 2: A Comparison of Pre and Post Runoff (Typical) (Source: (Source: Kimberly Brewer, 2012 Local Creek Symposium at NC Botanical Garden)



The concept of total stormwater volume control, also being referred to more and more as "runoff reduction", marks an important philosophical milestone that is helping define the next generation of stormwater design. The intention of runoff reduction is that the benefits go beyond flood protection and water quality improvement. If site and stormwater designs can successfully implement runoff reduction strategies, then they will do a better job at replicating a more natural (or pre-development) hydrologic condition. This goes beyond peak rate control to address total runoff volume, duration, velocity, frequency, groundwater recharge, and protection of stream channels. The field of stormwater management is actively involved in integrating the runoff reduction concept with stormwater requirements to create stormwater criteria that can be presented in a unified approach. This concept is also significantly challenging in areas such as Carrboro where the native soils are generally not as well drained as Coastal Plain or Sandhill soils and infiltration of stormwater is difficult to achieve.

What Are Other Jurisdictions Doing?

The focus on runoff volume as a common currency for stormwater management is gaining wider acceptance across the county (U.S. EPA, 2008). Within the Chesapeake Bay Watershed, the states of Delaware, Maryland, Virginia, and the District of Columbia have developed or are considering incorporating the concept of "runoff reduction" into updated stormwater regulations and design manuals (Capiella et al., 2007; DeBlander et al., 2008; MSC, 2008). The *Pennsylvania Stormwater Best Management Practices Manual* (PA DEP, 2006) already incorporates standards for volume control achieved by structural and nonstructural BMPs. Next year, Washington, D.C., plans to require major construction projects to incorporate enough water-holding structures to retain 1.2 inches of rain on the property (Arrandale, 2012). The Georgia Coastal Program has developed a *Coastal Stormwater Supplement to the Georgia Stormwater Management Manual* that incorporates runoff reduction principles (Novotney, 2008).

While a comprehensive review of runoff reduction practices and regulations in North Carolina has not been compiled for this memo, some observations about requirements in two Triangle jurisdictions and related information is touched on to provide some context. Chapel Hill has a stormwater control requirement as presented in the following exhibit.

Chapel Hill Stormwater Volume Requirement

"This ordinance seeks to.... minimize the total volume of surface water runoff that flows from any specific site during and following development in order to replicate the pre-development hydrology to the maximum extent practicable....The stormwater runoff volume leaving the site post-development shall not exceed the stormwater runoff volume leaving the pre-development site (existing conditions) for the local 2-year frequency, 24 hour duration storm event.... This may be achieved by hydrologic abstraction, recycling and/or reuse, or any other accepted scientific method."

Carrboro staff have discussed with Chapel Hill staff their experience with implementing this requirement. Chapel Hill staff have indicated that a very strict interpretation (i.e., requiring an exact match of pre and post hydrographs or essentially no deviation in the total volume) of this provision is very difficult to achieve because of the naturally poorly drained soils that exist locally. Chapel Hill has also in general found that stormwater sizing has not been driven by this provision in their ordinance, but by design for peak flow for larger (25 year) storm events.

Wake County includes volume control provisions that target runoff volume for ultra low- and low-density development and use BMPs to control the first 1" of runoff for high density development. Residential development is required to not exceed a "maximum curve number" as defined in the Natural Resource Conservation Service Technical Release 55, Urban Hydrology for Small Watersheds (USDA, 1986). This is a standard urban hydrology methodology that is referenced in the North Carolina Division of Water Quality BMP Manual (NCDWQ, 2009). A table of curve numbers from this manual is appended below.

A related pursuit in North Carolina is the pursuit of "Low Impact Development" (LID) site planning and development approaches that seek to minimize impacts on the natural hydrology. Pacifica is an example of a local project that employed LID principles in planning and design. A statewide manual

has been developed to provide guidance (NCCES, 2009). Huntersville is one jurisdiction that has included LID provisions in its ordinance (CMSWS, 2012). Runoff reduction and LID concepts are incorporated in LEED certification credits as shown in the following exhibit.

LEED for New Construction 2009 (Credit 6.2)

Potential Technologies & Strategies

Design the project site to maintain natural stormwater flows by promoting infiltration. Specify vegetated roofs, pervious paving and other measures to minimize impervious surfaces. Reuse stormwater for non-potable uses such as landscape irrigation, toilet and urinal flushing, and custodial uses.

1 "Manage Onsite" refers to capturing and retaining the specified volume of rainfall to mimic natural hydrologic runoff characteristics. This includes, but is not limited to, strategies that manage volume through evapotranspiration, infiltration, or capture and reuse.
2 Low Impact Development (LID) is defined as an approach to managing stormwater runoff that emphasizes on-site natural features to protect water quality by replicating the pre-development hydrologic regime of watersheds and addressing runoff close to its source. Examples include better site design principles such as minimizing land disturbance, preserving vegetation, minimizing impervious cover, and design practices like rain gardens, vegetated swales and buffers, permeable pavement, and soil amendments. These are engineered practices that may require specialized design assistance.
3 Green infrastructure is a soil and vegetation-based approach to wet weather management that is cost-effective, sustainable, and environmentally friendly (US EPA).

What Stormwater Management Approaches Are Available to Reduce Runoff?

One way of categorizing approaches to runoff reduction is as "nonstructural" versus "structural". A similar presentation is via approaches that are more planning oriented and more engineering oriented. Nonstructural/planning approaches attempt to reduce runoff via methods that minimize unnecessary or unwise disturbance that increases runoff whereas structural methods attempt to treat and manage runoff resulting from disturbance. Structural practices have for years been known as "Best Management Practices" (BMPs). The effectiveness of these practices in reducing overall runoff is beginning to be captured in guidance and planning tools for stormwater management, as depicted in the following table.

Table 1 (Source: Hirschmann et al; NCSU & NCDENR, 2011)

Runoff Reduction % for various BMPs (relative to no treatment)		
Practice	**Virginia***	**JLAT** (NC Piedmont)**
Green Roof	*45 to 60%*	*50*
Rooftop Disconnection	*25 to 50%*	*NA*
Raintanks and Cisterns	*40%*	*User defined*
Permeable Pavement	*45 to 75%*	*0*
Grass Channel	*10 to 20%*	*0*
Bioretention	*40 to 80%*	*35-50%*
Dry Swale	*40 to 60%*	
Wet Swale	*0*	
Infiltration	*50 to 90%*	*NA*
ED Pond	*0 to 15%*	*0*
Soil Amendments	*50 to 75%*	*NA*
Sheetflow to Open Space	*50 to 75%*	*40*
Filtering Practice	*0*	*5*
Constructed Wetland	*0*	*20*
Wet Pond	*0*	*10*

* Virginia statewide technical provisions

* Jordan Lake Accounting Tool assumptions

The above table references a stormwater regulatory tool recently developed at NCSU to support implementation of new development requirements in the Jordan Lake Rules. While its use focuses on regulation of nitrogen and phosphorus, the calculation for nutrient loading (in lb/ac/yr) requires the calculation of total annual runoff volume. It is noteworthy in considering the need for stormwater volume or runoff reduction provisions in the Town's ordinance and the timing in parallel with implementation of new development provisions for nitrogen and phosphorus per the Jordan Lake Rules that the rules allow for "offset payments". Preliminary experience with the Jordan Lake Accounting Tool indicates that compliance with the Town's existing water quality treatment provisions for total suspended solids will make it possible for many new developments to comply with the new rules simply via an offset payment with little or no additional onsite treatment beyond

what is currently required in the ordinance. This underscores an interest in considering a volume control/runoff reduction component in the ordinance given that protection of local waterways is an overarching goal in Carrboro. A final point regarding NCDWQ approaches for stormwater regulation is that workshops are planned for this summer announcing new consideration of and approaches for permeable pavement that could result in additional volume control credits for this technique. Note above that the Jordan Lake Accounting Tool currently assumes no credit for volume control for permeable pavement.

Carrboro's Draft Ordinance Provision for Stormwater Volume

"No impact" development given Carrboro's zoning and policies is not feasible when it comes to maintaining runoff at predevelopment conditions; the draft ordinance attempts to provide a transparent performance standard for achieving "low impact" development. The draft text provided for review is founded on this understanding and on the principals and concepts discussed above. A precedent of identical language in other ordinances has not been found. This draft text is unique in that 1) it explicitly quantifies in ordinance text the deviation in stormwater volume from the preexisting condition that is deemed acceptable; and 2) it uses the Jordan Lake Accounting Tool (in addition to curve numbers) to calculate annual (and not design event) stormwater volume. The JLAT does use the Simple Method (a standard runoff calculation method approved in the NCDWQ BMP Manual).

The intent of the draft text amendment is to establish a specific "not to exceed" maximum annual volume increase. In addition, utilizing the JLAT means that a separate set of calculations would not have to be completed to address the ordinance requirement. The thresholds for % increase have been set based on judgment from application of the tool for several sites with recent development applications (see below). The minimum curve number value (64) included in the table is based on the NCDWQ BMP Manual which states "if the composite CN is equal to or below 64, assume that there is no runoff resulting from either the 1 or 1½ inch storm". Other threshold values are based on review of the information in the appendix. Note that while the draft thresholds are based on careful review, they are not seen as "absolute". Staff envision that these thresholds can and should be reviewed with experience with implementing the Jordan Lake rules and using the Jordan Lake Accounting Tool.

What Specific Impacts Could This Ordinance Provision Have On Carrboro Development Applications?

This ordinance provision will require development applications that require stormwater management to address the need for runoff reduction. How any given development application will consider runoff reduction will depend on the site and the applicant's design goals. It is likely that a combination of approaches will all be employed that include additional and/or larger stormwater structural measures, greater reliance on structural practices that are more beneficial for runoff reduction, reduction in impervious surfaces, greater utilization of rainwater harvesting and reuse, and in general greater employment of LID principals and practices during the planning and design. An analysis has been completed of one completed project and three proposed projects to study the potential impacts on new development (Table 2).

Table 2: Annual Runoff Volume Change from Recent Applications

	Annual runoff (cubic feet)*				
	Pre-development	Post-development (with BMPs)	% change*	Monitored % change** (developed portion only)	Compliant with Draft Ordinance?
Claremont South	358,883	2,112,505	489%		No
Family Dollar	8,416	101,541	1170%		No
CVS	147,705	179,000	34%		Yes
Pacifica	92,012	342,639	272%	408%/946%	Probably
* from Jordan Lake Accounting Tool applications					
** (Line, WRRI, 2012) (values reported for each of two stations. *Note that these values are not appropriate for a regulatory interpretation since they do not represent the entire site.*)					

It appears from this analysis that:

1) The Claremont South application (recently approved) would have warranted modification to comply with this requirement via additional and/or different structural and/or nonstructural stormwater practices. Additional analysis is necessary to see if this requirement could have been met with stormwater management modifications alone or if some changes to other aspects of the site plan would have also been required.
2) The Family Dollar application would have significant challenges in complying with this requirement. A fundamentally different site plan with less disturbance would be warranted for this site to comply with this requirement. Additional/different runoff reduction stormwater management measures would also probably have to be employed, since a sand filter and detention are not effective in runoff reduction/total volume control.
3) The CVS stormwater management plan submitted in 2011 would comply with this requirement.
4) The Pacifica project (built) would probably comply with this requirement as designed based on JLAT tool runs.

Outreach

Staff advertised (to the Friends of Bolin Creek and Morgan Creek Valley Alliance and development applicants from the past several years) and held a drop in informational session on the draft ordinance on June 19 (afternoon and early evening).

Recommendation

Staff recommend that the Board review the draft ordinance and public input, and adopt the ordinance, or refer the ordinance to staff with specific feedback on improvements sought. Since this is not a mandated State requirement, this text amendment can be considered separately from the requirements being considered to comply with the new development provisions of the Jordan Lake Rules.

References

Arrandale, Tom, 2012. *The Price of Greening Stormwater.* In: Governing the States and Localities Newsletter. http://www.governing.com/topics/energy-env/price-greening-stormwater-philadelphia.html

Atlanta Regional Commission (ARC). 2001. *Georgia Stormwater Design Manual,* Volume 2: Technical Handbook. Atlanta, GA.

Capiella, K., D. Hirschman, and A. Kitchell. 2007. *Memorandum: Proposed Stormwater Philosophy to Guide Revisions to the Sediment and Stormwater Regulations (Delaware).*

DeBlander, B., D. Caraco, and G. Harper. 2008. *Memorandum: The District of Columbia Stormwater Management Guidebook Expansion, Issue Paper #1* (in production).

Charlotte-Mecklenburg Stormwater Services. LID website. Accessed May 24, 2012. http://charmeck.org/stormwater/regulations/Pages/LIDHuntersville.aspx

Hirschman, D., Collins, K. and T. Schueler. 2008. *Technical Memorandum: The Runoff Reduction Method. Developed for the Following Projects: Extreme BMP Makeover – Enhancing Nutrient Removal Performance for the Next Generation of Urban Stormwater BMPs in the James River Basin.* Virginia Stormwater Regulations & Handbook Technical Assistance.

Maryland Stormwater Consortium (MSC). 2008. *Core environmental site design principles for the implementation of the Maryland Stormwater Management Act of 2007.* Chesapeake Stormwater Network. Baltimore, MD

North Carolina Division of Water Quality, 2009. *DWQ Stormwater BMP Manual.* Available at http://portal.ncdenr.org/web/wq/ws/su/bmp-manual

NCSU Department of Biological and Agricultural Engineering and NC Department of Environment and Natural Resources.Debusk and Hunt. 2011. *Jordan Lake Accounting Tool Jordan/Falls Lake Stormwater Load Accounting Tool (Version 1.0) User's Manual.*

North Carolina Cooperative Extension Service, 2009. *Low Impact Development: A Guidebook for North Carolina.* http://www.ces.ncsu.edu/depts/agecon/WECO/lid/documents/NC_LID_Guidebook.pdf

Novotney, M. 2008. Technical Memorandum: Stormwater Management Approach for the Georgia Coastal Nonpoint Source Management Area and Area of Special Interest.

Pennsylvania Department of Environmental Protection (PA DE). 2006. *Pennsylvania Stormwater Best Management Practices Manual.*

USDA, 1986. *NRCS Technical Release 55, Urban Hydrology for Small Watersheds.*

U.S. Environmental Protection Agency. 2008. *Urban BMP Performance Tool* (online). http://cfpub.epa.gov/npdes/stormwater/urbanbmp/bmpeffectiveness.cfm.

Wake County Stormwater Ordinance. Downloaded from http://www.wakegov.com/NR/rdonlyres/84589E98-7163-4D58-8869-688341DAD390/0/newSWordinance.pdf

Appendix: Curve Number Reference Information

Table 2-2a Runoff curve numbers for urban areas [1]

Cover description		Curve numbers for hydrologic soil group			
Cover type and hydrologic condition	Average percent impervious area [2]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.)[3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation)[5]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

[1] Average runoff condition, and $I_a = 0.2S$.

[2] The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

[3] CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

[4] Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

[5] Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Source: NRCS, 1986

Figure 2-3 Composite CN with connected impervious area.

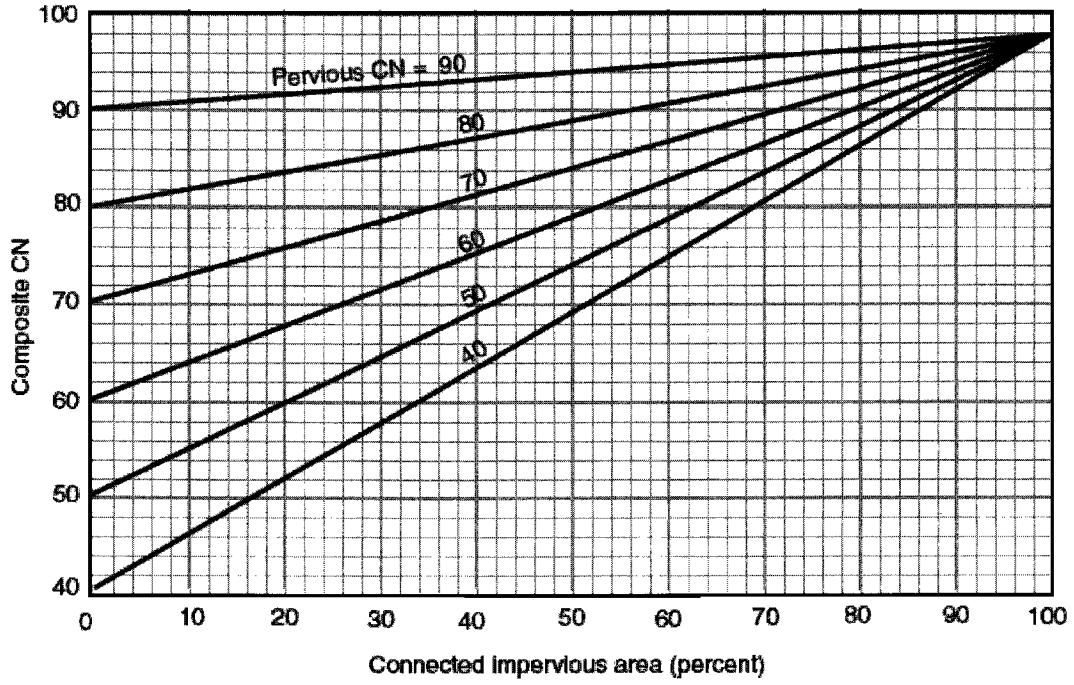
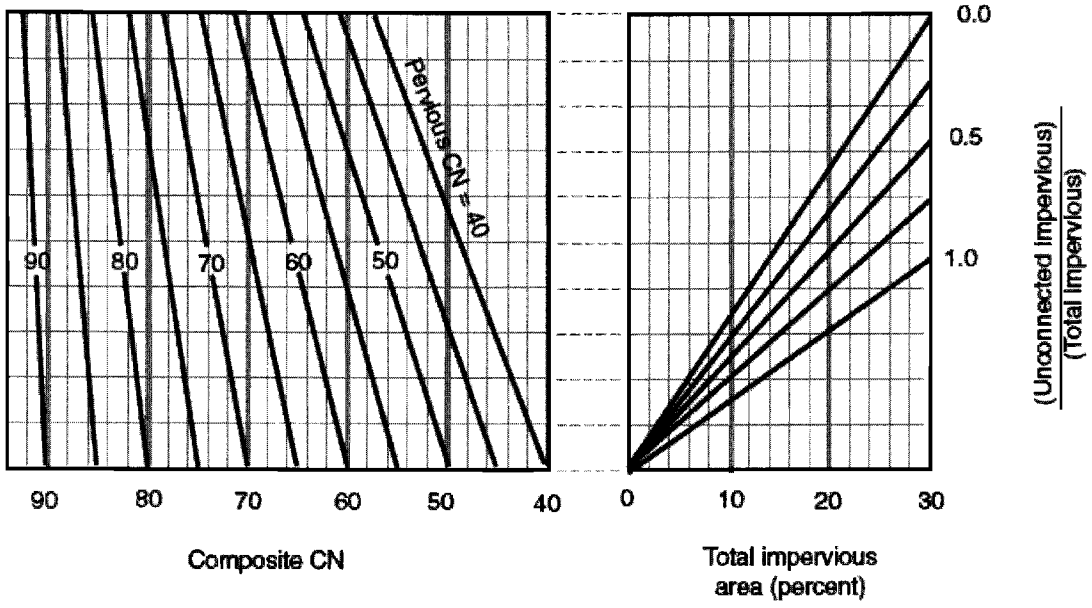


Figure 2-4 Composite CN with unconnected impervious areas and total impervious area less than 30%



Source: NRCS, 1986

ATTACHMENT D

ORANGE COUNTY PLANNING & INSPECTIONS DEPARTMENT

Craig N. Benedict, AICP, Director

Administration
(919) 245-2575
(919) 644-3002 (FAX)
www.co.orange.nc.us

131 W. Margaret Lane
P O Box 8181
Hillsborough,
North Carolina, 27278

TRANSMITTAL DELIVERED VIA EMAIL

June 5, 2012

Christina Moon, AICP
Planning Administrator
Town of Carrboro
301 W. Main St.
Carrboro, NC 27510

SUBJECT: Joint Planning Review of Proposed Ordinance Amendments

Dear Tina:

Thank you for the opportunity to review the following Land Use Ordinance amendments received by us on May 29, 2012 and proposed for town public hearing on June 26:

- *Compliance with Jordan Rules Relating to New Development*
- *Establishment of Stormwater Volume Control Requirement*
- *Authorization for the Board of Aldermen to allow deviations from Requirements of Sign Ordinance when Approving Master Signage Plan for Multi-Use Business Developments that Require the Issuance of a Conditional Use Permit*
- *Modification to Affordable Housing Payment In-Lieu*

We have reviewed the amendments and find no inconsistency with the adopted *Joint Planning Area Land Use Plan.*

If you have any questions or need additional information, please let me know.

Sincerely,

Perdita Holtz

Perdita Holtz, AICP
Planning Systems Coordinator

TOWN OF CARRBORO

EAB

301 West Main Street, Carrboro, North Carolina 27510

RECOMMENDATION

THURSDAY, JUNE 7, 2012

LAND USE ORDINANCE TEXT AMENDMENT
ADDING A STORMWATER VOLUME CONTROL REQUIREMENT

Motion was made by Nina and seconded by Rob that the EAB recommends that the Board of Aldermen approve the draft ordinance.

VOTE: **AYES:** Nina Butler, Rob Crook, Dustin Chicurel-Bayard, Matthew Armstrong, Bruce Sinclair
ABSENT/EXCUSED: Geoff Gisler, Ian Horse
NOES: –
ABSTENTIONS: –

Associated Findings

By a unanimous show of hands, the EAB membership also indicated that no members have any financial interests that would pose a conflict of interest to the adoption of this amendment.

Furthermore, the EAB of the Town of Carrboro finds that the proposed text amendment is consistent with Carrboro Vision 2020 regarding efforts to: protect water resources, particularly the following sections:

5.22 Carrboro should adopt a strategy and set of policies to protect all of our creeks, streams, ponds, and lakes.
5.23 Carrboro should be proactive in managing its stormwater, promoting active maintenance of facilities, reducing impacts of increased impervious surface, and minimizing impacts on waterways.

VOTE: **AYES:** Nina Butler, Rob Crook, Dustin Chicurel-Bayard, Bruce Sinclair, Matthew Armstrong
ABSENT/EXCUSED: Geoff Gisler, Ian Horse
NOES: –
ABSTENTIONS: –

Matthew Armstrong (Chair) 6/21/12 (Date)

TOWN OF CARRBORO

Planning Board

301 West Main Street, Carrboro, North Carolina 27510

RECOMMENDATION

THURSDAY, JUNE 21, 2012

LAND USE ORDINANCE TEXT AMENDMENT ADDING A STORMWATER VOLUME CONTROL REQUIREMENT

Motion was made by **Chaney** and seconded by **Clinton** that the **Planning Board** recommends the Board of Aldermen **does not take action** on the draft ordinance and instead that staff research the concerns in the attached memo and return to the Planning Board for discussion.

VOTE
AYES: Barton, Chaney, Clinton, Hunt, Killeen, Poulton, Schaefer, Seils
ABSENT/EXCUSED: Jaimeyfield, Foushee
NOES:
ABSTENTIONS: Ferrer

PLANNING BOARD
Comments Regarding Text Amendments for Volume Control
June 21, 2012

We recommend that regulation of total run-off and run-off curve shaping is a good direction for the town to take, in order to better preserve both the built and natural environment. The proposed ordinance and supporting documentation raise a number of questions. It is premature for the Planning Board to recommend definite changes in the draft ordinance. We recommend staff research to address the following concerns.

1. We support the staff recommendation to use a total volume calculation, which is already computed by the Jordan Lake Accounting Tool. If it is not already so identified for JLAT, the total volume should be identified as a supported output value which will not be deleted from the tool without consultation. The implementation of practical engineering appears to depend on this.

2. Improve the examples on page C-8 by adding a column for "Preexisting Composite Curve Number" in the pre-development and post-development condition. Identify the specific enhancements needed to these or other example projects to meet the draft ordinance, with approximate cost.

3. The scientific study for Pacifica seems to show that the JLAT substantially under-estimates the actual run-off volume, although there may be some issue regarding exactly how much of the site was measured.

Therefore we suggest staff consider if a value of 0% increase as shown by JLAT tool is appropriate for currently unbuilt land, i.e. land with PCCN < 70 or some similar value.

4. Referring to the reference [Charlotte-Mecklenburg Stormwater Services. LID website], Huntersville regulated peak run-off rate, is that needed also?

5. Should run-off curve-shaping be defined for the ordinance?

6. Also in the Huntersville regulation they say:
"No one BMP shall receive runoff from an area greater than five (5) acres." with the justification that this prevents over-dependence on a single critical BMP. Should this be added?

7. Huntersville provided a spreadsheet, is this easier for small developers than the JLAT? The NC LID Guidebook refers to a spreadsheet tool, should it be referred to in the ordinance? Will every new home or building have to do this calculation, or just large developments? Generally, discuss which tool is the proper one to use, and justify it.

8. The examples provided in http://charmeck.org/stormwater/regulations/Documents/Huntersville%20LID%20Documents/HuntersvilleLIDSitePlanConcepts.pdf are excellent, the public will understand these. Ch 3 of the NC LID Guidebook is similar. The new regulation of total run-off should be supported with specific references like these. Consider incorporating these and other BMPs into Appendix I of the Land Use Ordinance, to ensure consistency with the new requirements.

9. The supporting document could include examples of developments assessed
   a) with the JLAT tool, and
   b) with actual measurements.

Consider if there is some way to incorporate a reference to the supporting document into the ordinance, so that any future changes in the justification or ordinance would be kept in sync. This is a highly technical subject, and the bare ordinance language gives no guidance for future maintenance or adjustments to the ordinance.

John Fuller — June 21, 2012

(Chair) (Date)