



Amended, November 6, 2017

Please note that policies which have been fully implemented are shown in gray.

# Durham Comprehensive Plan

## Chapter 9 Water and Wastewater Element

# The Durham Comprehensive Plan

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# Chapter 9, Water and Wastewater Element

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# Water and Wastewater Element



*Summary of Issues*  
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Water is a basic human need and a fundamental service for municipal governments. Likewise, wastewater collection and treatment is also a fundamental service provided by many local governments. In recent years, Federal mandates have also made stormwater management a local government function. The central focus of the Water Utilities Element of the Durham Comprehensive Plan is to provide high quality utility services, while protecting the natural environment. Durham recognizes the importance for the community’s health, safety and economic well being of keeping water, wastewater, and stormwater facilities well maintained and adequate to accommodate new development.

## Summary of Issues

- 1. Raw Water Sources.** Durham will need to develop new supplies of raw water to serve expected future populations growth, taking into account the most reliable and cost-efficient water supply options with the least adverse environmental impact.
- 2. Regional Cooperation in Water Supply.** Durham must continue to work with Chatham, Orange and Person and potentially other counties on joint water supply initiatives, as well as adoption of local regulations that can preserve the present water quality, while taking into account the needs and concerns of these communities.
- 3. Regional Cooperation in Water Treatment.** Regional water treatment arrangements may benefit multiple jurisdictions and maximize the efficiency of the jurisdiction’s public infrastructure. Such regional water arrangements should be pursued in ways that most benefit Durham.
- 4. Water Conservation.** Water conservation programs are aimed at reducing the use of potable water for residences and businesses. Water conservation will delay the need for new water supplies and facilities and minimize the impact of water shortages.

5. **Wastewater Treatment Capacity.** Future growth and development in Durham depends on sufficient wastewater treatment capacity. Projected wastewater treatment demand is expected to reach 90 percent of plant capacity at the City's two wastewater treatment plants by 2017 and 2025. Durham will need to provide additional capacity by then, either through plant upgrade or building new facilities.
6. **Wastewater Treatment Standards.** Durham will likely face more stringent effluent standards at its wastewater treatment facilities, resulting in greater expense for wastewater treatment. Expensive upgrades to wastewater treatment facilities may be required in both the Cape Fear and Neuse River basins.
7. **Stormwater Treatment Standards.** The State will continue to set standards for on-site stormwater management and nitrogen export. Durham will be required to enforce these additional State standards to maintain high water quality.

## Goal 9.1, Water

Provide high quality potable water services to Durham's water service area in accordance with growth management objectives and policies.

### Objective 9.1.1. Water Level of Service Standards

Establish level of service standards for water supply and treatment.

**Policy 9.1.1a. Well Water Level of Service Standard.** In the Rural Tier and in other locations where public water supply is not available, the level of service standard shall be a well or a community well permitted in accordance with applicable requirements of the Durham County Health Department or the North Carolina Division of Environment and Natural Resources, Water Supply Section.

**Policy 9.1.1b. Public Water Level of Service Standard.** Continue to operate and maintain water treatment and distribution facilities to provide an adequate supply of drinking water in full compliance with water quality standards established by the US Environmental Protection Agency and the State of North Carolina, and in accordance with City of Durham engineering standards.

### Objective 9.1.2. Water Supply

Continue to identify and develop sufficient new raw water supply sources to support Durham's future demand, while efficiently using present water supply sources.

**Policy 9.1.2a. Jordan Lake Water Supply.** The Department of Water Management shall continue to pursue water supply allocations from

Jordan Lake (in addition to the present 10 million gallon per day allocation).

**Policy 9.1.2b. Future Water Supply Source.** The Department of Water Management shall continue to assess long-range water supply options to identify the most efficient alternatives to meet Durham's long-term water supply needs, evaluating, at a minimum, the following:

- i. Expand the capacity of Lake Michie by constructing a new and higher dam downstream of the existing dam, raising the lake's water pool elevation;
- ii. Develop a new water supply on either the Flat River or the Little River; and
- iii. Use Teer Quarry as off-line storage, filling from the Eno River and possibly other sources (Lake Michie and/or Little River).

### **Objective 9.1.3. Water Treatment and Distribution**

Develop and maintain capacity for treatment and distribution of water sufficient to support Durham's present and future water demand, while encouraging efficient use through a robust water conservation program.

**Policy 9.1.3a. Water Treatment Plant Capacity Expansion.** The Department of Water Management shall continue to plan for increasing additional water treatment plant capacity with a target date for construction to begin in late 2013. Capacity expansions shall include upgrades to the City's Brown Water Treatment Plant to provide for treatment of 42 million gallons per day.

**Policy 9.1.3b. Finished Water Interconnections.** The Department of Water Management shall continue to explore interconnections with other water providers to enhance regional sustainability.

**Policy 9.1.3c. Water Distribution System Plan.** The Department of Water Management shall continue to update the City's Water Distribution System Master Plan every 5 to 7 years.

**Policy 9.1.3d. Water Mains.** The Department of Water Management shall continue to construct new water mains to meet distribution needs. Program projects for both new construction and rehabilitation shall be included in the annual Capital Improvements Program.

**Policy 9.1.3e. Water Service Extension Outside the Suburban Tier.** The City Public Works Department shall continue to prohibit extensions of the water distribution system outside the Suburban Tier. The City may consider extension of the water distribution system outside the Suburban Tier only to properties with a verified water supply of unsatisfactory quantity or quality. Any extension of the City's water distribution system outside of the City limits shall be contingent upon approval by the City Council and shall be in accordance with applicable codes, policies, standards and specifications of the City, which includes a voluntary annexation request to the City.

### Objective 9.1.4. Water Supply Protection

Protect Durham's and the Region's water supply sources from water quality degradation by maintaining low intensity land uses on land near water supply reservoirs, reducing the risk of pollution from stormwater running off impervious surfaces, and by reducing the risk of discharge of hazardous and toxic materials into the natural drainage systems tributary to drinking water reservoirs. Allow development and platting of lots in stream buffers only in limited, strictly regulated, and special conditions.

**Policy 9.1.4a. Low Intensity Land Uses.** The City-County Planning Department and the City-County Inspections Department shall use the Unified Development Ordinance to maintain and enforce land use restrictions around water supply reservoirs.

**Policy 9.1.4b. Watershed Critical Areas and Land Use.** The City-County Planning Department shall use the Unified Development Ordinance to prohibit industrial land uses and maintain zoning that permits only low-density land uses in the Watershed Critical Areas, the most sensitive land near water supply reservoirs.

**Policy 9.1.4c. Impervious Surface Credit Transfer.** Through the Unified Development Ordinance, maintain procedures for the transfer of impervious surface credit from a donor parcel to a receiver parcel, provided that:

- i. The donor parcel and the receiver parcel shall be within the same water supply watershed;
- ii. The impervious surface credit transfer shall not be from a donor parcel in the Protected Area to the receiver parcel in the Critical Area; and
- iii. The portion of the donor parcel which is restricted from development shall remain in a vegetated or natural state and shall be placed in a permanent conservation easement granted to the City or County, or a land trust or similar conservation-oriented nonprofit organization.

Use of this tool shall allow a project to increase its impervious surface above the limits that would otherwise be required, but would not reduce the requirements to provide engineered stormwater systems for the receiver sites. (See Policy 2.3.3b, Impervious Surface Credit Transfer.)

**Policy 9.1.4d. Land Acquisition for Buffers.** To create a greater buffer around Lake Michie and other water supply sources, the Department of Water Management shall continue to acquire land from willing sellers.

**Policy 9.1.4e. Reservoir Buffers.** Through the Unified Development Ordinance, maintain undisturbed, naturally vegetated buffers on land within 250 feet of water supply reservoirs, and prohibit development activities within the reservoir buffers.

#### Watershed Protection Regulations

are different in the watersheds of the various water supply reservoirs because of the differences in their size, their sensitivity to water quality degradation, and their State water supply classification.



**Policy 9.1.4f. Stream Buffers.** Through the Unified Development Ordinance, continue to require undisturbed, naturally vegetated buffers of at least 50 feet on land adjacent to intermittent and perennial streams and prohibit most development activities in order to protect water quality. Through the Unified Development Ordinance, limit the ability to utilize land in stream buffers to meet minimum lot size requirements, and allow development and platting of lots in stream buffers only in limited, strictly regulated-conditions. (See Policy 7.1.2c. Stream Buffers and Policy 9.4.2b. Stream Buffers.)

#### **Objective 9.1.5. Regional Water Supply and Treatment Cooperation**

Support and encourage regional cooperation in water supply and water treatment services when such cooperation improves the protection of public health and the environment; reduces the cost of water services; and improves the quality, delivery and overall reliability of water services to customers.

**Policy 9.1.5a. Available Capacity of Neighboring Utility Systems.** Where possible and cost-effective, Durham shall utilize any available finished water capacity of neighboring utility systems to provide for additional reliability during periods when demands approach available water supply and treatment capacity, and to defer additional water treatment capital projects. The Department of Water Management shall explore a potential cooperative agreement with the Town of Cary for using the Town's excess water treatment capacity related to Durham's Jordan Lake water allocation.

**Policy 9.1.5b. Cooperation of Jordan Lake Water Treatment.** Through the creation of the Jordan lake Partnership, the City Department of Water Management shall continue to partner with the Orange Water and Sewer Authority (OWASA), Chatham County, Orange County, the Town of Cary, and other interested water suppliers in the region to forge regional relationships for collaboration on Jordan Lake water treatment.

#### **Objective 9.1.6. Drought Resistant Community**

Adopt conservation practices and policies to ensure that Durham becomes and remains a drought-resistant community.

### **Goal 9.2, Wastewater**

Provide wastewater collection and treatment services to Durham's service area, within the UGA and in accordance with growth management guidelines. Provide for the use by property owners of on-site ground absorption waste disposal systems where public wastewater utilities have not

or will not be extended in accordance with the Laws and Rules for Sewage Treatment and Disposal Systems (15A NCAC 18A 1900) which are enforced by the Durham County Health Department. Plan for the use of high quality treated wastewater (reclaimed water) for use for irrigation and other approved uses.

### **Objective 9.2.1. Wastewater Level of Service Standards**

Establish level of service standards for wastewater collection and treatment.

**Policy 9.2.1a. Wastewater Collection Level of Service Standards.** The City Department of Water Management and the County Engineering and Environmental Services Department shall continue to operate and maintain wastewater collection facilities in compliance with standards established by the US Environmental Protection Agency and the State of North Carolina, and in accordance with Durham City and County engineering standards.

**Policy 9.2.1b. Wastewater Treatment Level of Service Standards.** The Department of Water Management and the County Engineering and Environmental Services Department shall treat wastewater and resulting effluent and sludge in compliance with applicable National Pollutant Discharge Elimination System (NPDES) permits and within standards established by the US Environmental Protection Agency and the State of North Carolina.

**Policy 9.2.1c. On-Site Disposal System Level of Service Standard.** In the Rural Tier and in other locations where public wastewater collection and treatment is not available, the level of service standard shall be an operating on-site disposal system or a community wastewater treatment system permitted in accordance with applicable requirements of the County Health Department.

### **Objective 9.2.2. Wastewater Collection**

Construct, operate and maintain in a cost-effective manner a wastewater collection system that serves citizens and protects the natural environment.

**Policy 9.2.2a. Sewer Rehabilitation.** The City Department of Water Management shall continue to rehabilitate portions of the City's wastewater collection system by repairing, cleaning and replacing mains and outfalls, and shall use flow monitoring and television examination to monitor problem areas and program rehabilitation actions as needed.

**Policy 9.2.2b. Upgrade the Wastewater Collection System.** The City's Public Works and Water Management departments shall continue to upgrade Durham's wastewater collection system to meet collection needs, including constructing sewer lines by petition, constructing

sewer lines, rehabilitating wastewater lines, and making wastewater collection system improvements in advance of street paving.

**Policy 9.2.2c. Sewer Pump Station Removal.** The Department of Water Management shall seek funding to remove pump stations in the City's wastewater collection system that are located close to existing sewer outfalls in order to reduce operation and maintenance costs.

**Policy 9.2.2d. Sewer Service Extension Outside the Suburban Tier.** The City Public Works Department and the County Engineering Department shall continue to prohibit extensions of the sewer collection system outside of the Suburban Tier, except to properties with a verified existing health hazard from an on-site sanitary sewer system. Any extension of the City's sewer collection system outside of the City limits shall be contingent upon approval by the City Council and shall be in accordance with applicable codes, policies, standards and specifications of the City, which includes a voluntary annexation request to the City.

### Objective 9.2.3. Wastewater Treatment

Develop and maintain capacity for cost-effective wastewater treatment sufficient to support Durham's present and future demand, while meeting or exceeding State and Federal effluent standards and protecting the natural environment.

**Policy 9.2.3a. Water Reclamation Plant Upgrade.** The Department of Water Management shall upgrade the North and South Durham Water Reclamation Facilities as needed to maintain efficient and cost-effective operation. The Durham County Engineering and Environmental Services Department shall renovate the Triangle Wastewater Treatment Plant as needed to maintain efficient and cost-effective operation.

**Policy 9.2.3b. Wastewater Treatment in the Rural Tier.** The City-County Planning Department and the County Health Department shall explore and propose regulatory provisions in the Unified Development Ordinance for wastewater treatment in the Rural Tier that facilitate conservation-by-design and clustered residential and nonresidential development while protecting the Region's water supplies.

### Objective 9.2.4. Regional Cooperation

Support and encourage regional cooperation in wastewater services when such cooperation improves the protection of public health and the environment; reduces the cost of wastewater services; and improves the quality, delivery and overall reliability of wastewater services to customers.

**Policy 9.2.4a. Collaboration Between Durham, and the Orange Water and Sewer Authority.** The Department of Water Management and the County Engineering and Environmental Services Department shall seek opportunities to collaborate between the City of Durham, Durham County and the Orange Water and Sewer Authority (OWASA) regarding discharges into tributaries of Jordan Lake.

**Policy 9.2.4b. Collaboration with Other Jurisdictions.** The Department of Water Management shall continue discussions with other jurisdictions in the Upper Neuse River basin to investigate opportunities to collaborate on discharges into Falls Lake Basin.

### Goal 9.3, Resource Conservation and Recovery

To integrate pollution prevention and resource conservation into all operations of local government, to reduce the environmental impacts of local government, and to minimize costs associated with waste management.

#### Objective 9.3.1. Water Conservation

Reduce per capita water usage in the Durham water service area.

**Policy 9.3.1a. Water Audit and Leak Detection Study.** The Department of Water Management shall continue to implement recommendations from the 2008 water audit and leak detection study.

**Policy 9.3.1b. Water Conservation/Efficiency Program.** The Department of Water Management Department shall continue to monitor and evaluate water consumption of all customers and the costs and effectiveness of adopted water efficiency actions and program activities.

**Policy 9.3.1c. Water Rates.** The Department of Water Management shall continue to utilize a rate structure that encourages water efficiency.

**Policy 9.3.1d. Educate Households on Water Efficiency.** In order to offset the economic impact of higher rates in the future, the City Manager's Office and the Department of Water Management shall provide households with information about how to save water.

**Policy 9.3.1e. Provision of Household Water Efficiency Resources.** In order to offset the economic impact of higher water rates in the future, the City Department of Water Management shall develop programs to provide households with water-saving devices such as high efficiency showerheads, faucet aerators, and provide incentives such as toilet rebate/credit programs.

**Policy 9.3.1f. Water Conservation in Areas not Served by the City Department of Water Management.** The Durham County Health Department shall advise property owners served by private wells on the importance of leak detection and water conservation.

### Objective 9.3.2. Water Reclamation and Re-use

Promote opportunities for bulk use of reclaimed water from Durham’s water reclamation facilities.

**Policy 9.3.2a. Reclaimed Water Pilot Program.** The City Department of Water Management and the County Engineering and Environmental Services Department shall plan and implement a pilot reclaimed water system near one of Durham’s water reclamation or wastewater treatment facilities serving nearby City facilities, County facilities, and/or private reclaimed water users.

**Policy 9.3.2b. Bulk Reclaimed Water.** The Department of Water Management’s Master Plan for Water Reclamation Facilities shall include permanent bulk reclaimed water from the North Durham Water Reclamation Facility.

### Objective 9.3.3. Water and Wastewater Treatment Residuals

Develop long-range plan for the safe and efficient disposal of dewatered solids from Durham’s water treatment plants and water reclamation facilities.

**Policy 9.3.3a. Water and Wastewater Treatment Residuals Management Studies.** The Department of Water Management and the County Engineering and Environmental Services Department shall conduct studies to evaluate cost-efficient options for managing and disposing of water and wastewater treatment plant residual solids.

**Policy 9.3.3b. Regional Water and Wastewater Treatment Residuals Management Facility.** The Department of Water Management and the County Engineering and Environmental Services Department shall continue dialogue with other utility providers in the Region about joint residual management options that take advantage of economies of scale.

## Goal 9.4, Stormwater Management

Design, construct and maintain a stormwater management system that minimizes water quality degradation and water quantity impacts associated with stormwater runoff and preserves and utilizes the existing natural systems. Encourage low impact development design and “green” stormwater management strategies.

### Objective 9.4.1. Stormwater Level of Service Standards

Establish level of service standards for managing stormwater quantity and quality.

**Policy 9.4.1a. Water Quantity Level of Service Standard.** The water quantity level of service standard shall be that new development will

**Residuals Management** is necessary because water treatment processes and wastewater treatment processes produce leftover solid materials, called residuals. Durham has an obligation to dispose of these materials in an environmentally safe way.

not increase the post-development peak runoff rate from the 1-year storm over the predevelopment peak runoff rate by more than 10 percent.

**Policy 9.4.1b. Water Quality Level of Service Standard, Nutrient Export Limits.** Through the Unified Development Ordinance and City and County Stormwater Ordinances, the City and County shall establish a level of service standard for nutrient and other pollutant export from new development. These standards shall meet or exceed the limits adopted for Jordan and/or Falls lakes by the North Carolina Environmental Management Commission and/or the North Carolina General Assembly. The City and County shall ensure that this standard is met by evaluating all new development proposals at the time of site plan submission.

**Policy 9.4.1c. Water Quality Level of Service Standard, Watershed Protection Areas.** The level of service standard for water quality in watershed protection areas shall be deemed to be met by the treatment of the first 1-inch of stormwater runoff.

**Policy 9.4.1d. Stormwater Management Standards for Compact Neighborhood and Downtown Tiers.** The City Public Works and the City-County Planning Departments shall research and propose stormwater management standards that accommodate the development pattern of the Downtown and Compact Neighborhood Tiers and that are compatible with State and Federal requirements.

**Policy 9.4.1e. Re-evaluating Stormwater Management Level of Service Standards.** The City-County Planning Department, the City Public Works Department, and the County Engineering and Environmental Services Department shall re-evaluate the stormwater management level of service standards specifically seeking to address run-off associated with the 25-year storm when considering changes to the Unified Development Ordinance to incorporate stormwater management requirements.

## **Objective 9.4.2. Natural Stormwater System**

Protect the natural functions of stormwater management features.

**Policy 9.4.2a. Development Regulation.** Through the Unified Development Ordinance, maintain land use and development regulations to protect the natural functions of streams and water features.

**Policy 9.4.2b. Stream Buffers.** Through the Unified Development Ordinance, continue to require undisturbed, naturally vegetated buffers of at least 50 feet on land adjacent to intermittent and perennial streams and prohibit most development activities in order to protect water quality. Through the Unified Development Ordinance, limit the ability to utilize land in stream buffers to meet minimum lot size requirements, and allow development and platting of lots in stream

buffers only in limited, strictly regulated-conditions. (See Policy 7.1.2c. Stream Buffers and Policy 9.1.4f. Stream Buffers.)

### **Objective 9.4.3. Managing Stormwater from Existing Development**

Improve water quality and reduce stream degradation from stormwater runoff from existing development in Durham.

**Policy 9.4.3a. Illicit Discharges.** The City Public Works Department shall continue to operate a program to detect and eliminate significant hidden non-stormwater discharges either directly into receiving waters or indirectly via the stormwater conveyance system. The program shall:

- i. Identify problems and priority areas through stream monitoring and other means;
- ii. Trace the source of an illicit discharge;
- iii. Remove the source of the discharge; and
- iv. Include ongoing evaluation of program effectiveness.

**Policy 9.4.3b. Industrial and Commercial Inspections.** The City Public Works Department shall continue to conduct regular inspections of industrial and commercial operations to detect unauthorized discharges into the stormwater drainage system.

**Policy 9.4.3c. Street Sweeping.** The City Public Works Department shall continue to conduct a periodic program of street sweeping to remove leaves, other organic debris, trash and other pollutants from street gutters in order to enhance the quality of stormwater runoff.

**Policy 9.4.3d. Stormwater System Retrofit.** The City Public Works Department shall continue to identify locations for cost-effective retrofit or improvements to the stormwater conveyance system that will improve the quality of stormwater runoff and/or reduce the potential for downstream flooding.

### **Objective 9.4.4. Stormwater from New Development**

Durham will take actions to reduce pollution from stormwater runoff from new development, both during the construction process and after construction is complete.

**Policy 9.4.4a. Sedimentation and Erosion Control.** The County Engineering and Environmental Services Department shall continue to regulate land-disturbing activity to control accelerated erosion and sedimentation in order to prevent the pollution of water and other damage to lakes, watercourses, and other public and private property. No person shall initiate any land-disturbing activity that uncovers more than 12,000 square feet without a Land Disturbance Permit or more than 20,000 square feet without having an erosion control plan approved by the Sedimentation and Erosion Control Office that:

- i. Identify critical areas on the site subject to severe erosion and offsite areas vulnerable to damage;

- ii. Limit time of exposure;
- iii. Limit exposed areas;
- iv. Control surface water originating upgrade of the exposed areas;
- v. Control sedimentation; and
- vi. Manage stormwater runoff to control the velocity at the point of discharge to minimize accelerated erosion of the site and increased sedimentation of the stream.

(See Policy 7.1.2a. Sedimentation and Erosion Control.)

**Policy 9.4.4b. Stormwater Development Review.** The City Public Works Department and the County Engineering and Environmental Services Department shall continue to review new development proposals, specifically development plans, site plans, construction drawings, and as-built drawings to ensure compliance with City of Durham or Durham County stormwater requirements, including:

- i. Stormwater impact assessment requirements for peak flow control in the 1-year, 2-year, 10-year, and other design storm events;
- ii. Design of new best management practices (BMPs) to comply with requirements for watershed protection high-density option;
- iii. City of Durham stormwater performance standards, including Jordan, Falls, Lower Neuse basin, and NPDES permit requirements; and
- iv. Impacts to riparian areas and floodplain areas to comply with requirements in the Unified Development Ordinance (UDO).

**Policy 9.4.4c. Stormwater Impact.** Through the Unified Development Ordinance and Code of Ordinances, require that any person proposing new development assess potential flooding and water pollution impacts on existing downstream areas as a result of the new development. Prior to the approval of any preliminary plat or site plan, or the issuance of a building permit for any structure other than a single-family residence, the owner of the property proposed for development shall submit a Stormwater Impact Analysis which determines the impact of the increased stormwater runoff on downstream stormwater facilities and properties. The Stormwater Impact Analysis shall be required whenever:

- i. Proposed development anywhere in the County proposes to increase the peak runoff rate from various storm events, including but not limited to the 2-year storm or the 10-year storm; and
- ii. Proposed development in the Neuse and Cape Fear River basins proposes to increase peak runoff rate from the 1-year storm.



The Stormwater Impact Analysis shall comply with the requirements of the City Public Works Department Director or County Engineer, as appropriate. The City Public Works Department Director or County Engineer, as appropriate, shall determine the need for stormwater management facilities to address offsite impacts.

**Policy 9.4.4d. Required Stormwater Management Facilities and Improvements.** Through the Unified Development Ordinance and the Code of Ordinances, for any land-disturbing activity that results in a significant increase in stormwater discharge, the City Public Works Department Director or the County Engineering and Environmental Services Department Director, as appropriate, may require the developer to provide stormwater management facilities or make other improvements to the existing drainage system to address water quantity concerns, water quality concerns, or both if the proposed development will increase potential flood damages to existing properties or significantly increase pollutant levels in downstream receiving waters. The City Public Works Department Director or the County Engineering and Environmental Services Department Director, as appropriate, shall determine pollution source hotspots, including but not limited to trash compactors and vehicle wash facilities, that require higher levels of treatment.

**Policy 9.4.4e. Engineered Stormwater Controls, Neuse River Basin.** Engineered stormwater controls shall be required for new development within the Neuse River basin if the post-development peak runoff rate from the 1-year storm increases by more than 10 percent, such that there is no net increase.

**Policy 9.4.4f. Engineered Stormwater Controls, County-Wide.** Engineered stormwater controls are required for new development anywhere in the County at the discretion of the City Director of Public Works Department or the County Engineer, as appropriate, if the post-development peak runoff rate from the 2-year and 10-year storms increases.

**Policy 9.4.4g. Stormwater Management and Redevelopment.** The City Public Works and the City-County Planning Departments shall research and propose specific measures to remove disincentives to redevelopment associated with requirements for nutrient reduction and stormwater management.

**Policy 9.4.4h. Stormwater Credit.** For new development other than single-family residential development, the City Public Works Department shall continue to offer a credit against the ratepayer's stormwater service fee for measures that reduce peak discharge, or improve water quality, above and beyond requirements.

**Policy 9.4.4i. Low Impact Design in Watershed Critical Areas.** To encourage use of low impact site design in Watershed Critical areas,

require through the Unified Development Ordinance, that only those site plans which propose to use the high density option (employing greater impervious surface and engineered stormwater controls) in these areas shall require approval by the Governing Bodies. Site plans employing less impervious surface may be approved administratively unless other issues require plans to be reviewed by Governing Bodies.

**Policy 9.4.4j. Floodplain Developments.** The Unified Development Ordinance shall allow development and platting of lots in the 100-year floodplain only in limited, strictly regulated, and special conditions. To discourage fill in the floodplains and reliance on more natural drainage systems, require, through the Unified Development Ordinance, that site plans for projects in the Rural and Suburban Tiers that propose to use fill in the floodplain as part of their design shall require approval by the Governing Bodies. Such approval shall be granted only if the project results in a higher quality design than would otherwise be available.

**Policy 9.4.4k. Alternative Stormwater Treatment.** The City Public Works Department, the County Engineering and Environmental Services Department, and the City-County Planning Department shall keep current on the latest stormwater treatment technologies and standards accepted by the NC Department of Environment and Natural Resources (NCDENR), and shall investigate alternative stormwater treatment techniques, such as rain gardens, stormwater re-use, and natural stormwater retention areas.

#### **Objective 9.4.5. Public Education and Outreach**

Implement a public education program to distribute educational materials to the community about the impacts of storm water discharges on water bodies and the steps that the public can take to reduce pollutants in storm water runoff.

**Policy 9.4.5a. Educational Program.** The City Public Works Department shall:

- i. Prepare and distribute informative newsletters;
- ii. Establish and maintain a telephone hotline for citizens to report suspected incidents of stormwater pollution;
- iii. Create and make presentations to schools and community groups about the stormwater runoff, and
- iv. Conduct workshops for the development community and for local government officials about the stormwater management program.

**Policy 9.4.5b. Impervious Surfaces Mapping.** The City-County Planning Department shall prepare a map showing, with the best available date, existing levels of impervious surfaces in Durham County, especially in the urbanized areas.

## Amendment History

### Amended – June 26, 2006

**Policy 9.1.3b, Finished Water Interconnections.** The City Water Management and ~~Public Works~~ Departments shall develop new finished water interconnections with the City of Raleigh and Butner to improve system reliability and emergency response. Reinforce and expand the existing finished water interconnects with the Town of Cary, the Town of Hillsborough, the Orange Water and Sewer Authority (OWASA) and Chatham County to enhance the system reliability and emergency response.

**Policy 9.1.3c, Water Distribution System Plan.** The City ~~Public Works Department~~ Water Management Department shall continue to update the City's Water Distribution System Master Plan every 5 to 7 years.

**Policy 9.2.2c, Sewer Pump Station Removal.** The City ~~Public Works Department~~ Water Management Department shall seek funding to remove pump stations in the City's wastewater collection system that are located close to existing sewer outfalls in order to reduce operation and maintenance costs.

**Policy 9.3.1a, Water Audit and Leak Detection Study.** The City ~~Public Works Department~~ Water Management Department shall implement recommendations from the recently completed water audit and leak detection study.

### Amended – January 5, 2009

**Policy 9.3.1c. Water Rates.** The Department of Water Management shall propose and the City Council shall adopt a rate structure that encourages water conservation.

**Policy 9.3.1d. Educate Households on Water Conservation.** In order to offset the economic impact of higher water rates in the future, the City Manager's Office and the City Water Management Department shall provide households with information about how to save water.

### **Policy 9.3.1e. Provision of Household Water Conservation Resources.**

In order to offset the economic impact of higher water rates in the future, the City Manager's Office and the City Water Management Department shall develop programs to provide households with water-saving devices such as efficient showerheads, faucet aerators, and toilet tank displacement devices.

### Amended – October 26, 2009

**Policy 9.2.4a. Collaboration Between Durham, and the Orange Water and Sewer Authority.** The City ~~Department of~~ Water Management Department and the County Engineering Department shall seek opportunities to collaborate between the City of Durham, Durham County and the Orange Water and Sewer Authority (OWASA) ~~to collaborate on future upgrades and expansions at the South Durham Water Reclamation Facility~~ regarding discharges into tributaries of Jordan Lake.

**Policy 9.2.4b. Collaboration with Other Jurisdictions.** The City ~~Department of~~ Water Management Departments shall ~~initiate~~ continue discussions with other jurisdictions in the Upper Neuse River basin to investigate opportunities to collaborate on discharges into Falls Lake basin. ~~on future upgrades and expansions at the North Durham Water Reclamation Facility.~~

**Policy 9.3.1a. Water Audit and Leak Detection Study.** The City Department of Water Management Department shall continue to implement recommendations from the recently completed 2008 water audit and leak detection study.

**Policy 9.3.1b. Water Conservation Program.** The City Department of Water Management Department shall continue to monitor and evaluate ~~conduct a water conservation study and establish a basis for an evaluation~~ water consumption of all customers and of the costs and effectiveness of proposed adopted water conservation actions and program activities.

**Amended October 11, 2010**

**Policy 9.1.3a. Water Treatment Plant Capacity Expansion.** The Department of Water Management shall continue to plan for increasing additional water treatment plant capacity with a target date for expanded operation at the City's Brown Water Treatment Plant by 20082012. Further ~~Options~~ for capacity expansion include ~~expansion of the City's Brown Water Treatment Plant,~~ construction of a new plant at Jordan Lake and purchase of treatment capacity from Cary.

**Policy 9.3.2a. Reclaimed Water Pilot Program.** The Department of Water Management ~~and the County Engineering Department~~ shall ~~plan and has implemented~~ a pilot reclaimed water system ~~near one of~~ at the North Durham Water Reclamation Facility. The Department shall implement other pilot facilities at the City and County Wastewater Reclamation Facilities. ~~Durham's water reclamation or wastewater treatment facilities serving nearby City facilities, County facilities and/or private reclaimed water users.~~

**Policy 9.4.1b. Water Quality Level of Service Standard, Nutrient Export Limits~~Neuse River Basin.~~** Through the Unified Development Ordinance and City and County Stormwater Ordinances, the City and County shall establish a level of service standard for nutrient and other pollutant export from new development. These standards shall meet or exceed the limits adopted for Jordan and/or Falls lakes by the North Carolina Environmental Management Commission and/or the North Carolina General Assembly. The City and County shall ensure that this standard is met by evaluating all new development proposals at the time of site plan submission. ~~The level of service standard for water quality in the Neuse River Basin shall be to ensure that new development limits nitrogen export to 3.6 pounds per acre per year. The nitrogen export limit may be met by using one or more of the following strategies:~~

- i. ~~Limiting the amount of impervious surfaces;~~
- ii. ~~Treating stormwater runoff to reduce nitrogen; or~~
- iii. ~~Making payments of offset fees to the NC Wetland Restoration Fund.~~

**Amended – May 14, 2012 – See Appendix X**

**Amended – February 25, 2013**

**Policy 9.1.3e. Water Service Extension Outside the Suburban Tier~~Urban Growth Area.~~** The City Public Works Department shall continue to prohibit extensions of the water distribution system outside of the Suburban Tier~~Urban Growth Area (UGA).~~ The City may consider extension of the water distribution system outside the UGA Suburban Tier only to properties with a verified water supply of unsatisfactory quantity or quality. Any extension ~~as described above~~ of the City's water distribution system outside of the City limits shall be contingent upon approval by the City Council and shall be in accordance with applicable codes, policies, standards and specifications of the City, which includes a voluntary annexation request to the City.

**Objective 9.2.2. Wastewater Collection.** Construct, operate and maintain in a cost-effective manner a wastewater collection system that serves the citizens and businesses inside the Urban Growth Area and protects the natural environment.

**Policy 9.2.2d. Sewer Service Extension Outside the ~~Suburban Tier Urban Growth Area~~.** The City Public Works Department and the County Engineering Department shall continue to prohibit extensions of the sewer collection system outside of the Suburban Tier Urban Growth Area (UGA), except to properties with a verified existing health hazard from an on-site sanitary sewer system. Any extension of the City's sewer collection system outside of the City limits as described above shall be contingent upon approval by the City Council and shall be in accordance with applicable codes, policies, standards and specifications of the City, which includes a voluntary annexation request to the City.

**Amended – June 10, 2013**

**Policy 9.1.1b. Public Water Level of Service Standard.** Continue to operate and maintain water treatment and distribution facilities to provide an adequate supply of drinking water 170 gallons per capita per day in full compliance with water quality standards established by the US Environmental Protection Agency and the State of North Carolina, and in accordance with City of Durham City engineering standards.

**Policy 9.2.2b. Upgrade the Wastewater Collection System.** The City's Public Works and Water Management Departments shall continue to upgrade Durham's wastewater collection system to meet collection needs, including constructing sewer lines by petition, constructing sewer lines, rehabilitating wastewater lines, and making wastewater collection system improvements in advance of street paving.

**Policy 9.1.3a. Water Treatment Plant Capacity Expansion.** The Department of Water Management shall continue to plan for increasing additional water treatment plant capacity with a target date for operation by 2012 construction to begin in late 2013. Capacity expansions shall include upgrades to the City's Brown Water Treatment Plant to provide for treatment of 42 million gallons per day. Additional long term options may include construction of a new plant at Jordan Lake and purchase of treatment capacity from Cary.

**Policy 9.2.3a. Water Reclamation Plant ~~Renovation Upgrade~~.** The Department of Water Management shall renovate upgrade the North Durham Water Reclamation Facility and the South Durham and South Durham Water Reclamation Facilities as needed to maintain efficient and cost-effective operation, and The Durham County Engineering and Environmental Services Department shall renovate the Triangle Wastewater Treatment Plan as needed to maintain efficient and cost-effective operation.

**Policy 9.3.1b. Water Conservation/Efficiency Program.** The Department of Water Management Department shall continue to monitor and evaluate water consumption of all customers and the costs and effectiveness of adopted water ~~conservation actions~~ efficiency actions and program activities.

**Policy 9.3.1c. Water Rates.** The Department of Water Management shall continue to utilize a rate structure that encourages water ~~conservation~~ efficiency.

**Policy 9.3.1d. Educate Households on Water ~~Conservation~~ Efficiency.** In order to offset the economic impact of higher rates in the future, the City Manager's Office and the Department of Water Management shall provide households with information about how to save water.

**Policy 9.3.1e. Provision of Household Water ~~Conservation~~ Efficiency Resources.** In order to offset the economic impact of higher water rates in the future, the City Department of Water Management shall develop programs to provide households with water-saving devices such as high efficiency showerheads, faucet aerators, and provide incentives such as toilet rebate/credit programs.

**Policy 9.4.4b. Development Review.** The City Public Works Department and the County Engineering and Environmental Services Department shall continue to review new development proposals, specifically development plans, site plans, and construction drawings, to ensure compliance with City of Durham or Durham County stormwater requirements, including:

- i. Stormwater impact assessment requirements for peak flow control in the 1-yr, 2-yr, 10-yr, and 100-yr storm events;
- ii. Design of new best management practices (BMPs) to comply with requirements for watershed protection high density option; ~~and~~
- iii. ~~Neuse River Basin~~ City of Durham stormwater ~~management~~ performance standards, including Jordan, Falls and Lower Neuse basin requirements; ~~and~~
- iv. Impacts to riparian areas and floodplain areas to comply with requirements in the Unified Development Ordinance (UDO).

**Policy 9.4.4c. Stormwater Impact.** Through the Unified Development Ordinance, require that any person proposing new development assess potential flooding and water pollution impacts on existing downstream areas as a result of the new development. Prior to the approval of any preliminary plat or site plan, or the issuance of a building permit for any structure other than a single-family residence, the owner of the property proposed for development shall submit a Stormwater Impact Analysis which determines the impact of the increased stormwater runoff on downstream stormwater facilities and properties. The Stormwater Impact Analysis shall be required whenever:

- i. Proposed development anywhere in the County proposes to increase the peak runoff rate from ~~with~~ various storm events, including but not limited to the 2-year storm or the 10-year storm; ~~or and~~
- ii. Proposed development in the Neuse and Cape Fear ~~River~~ basins proposes to increase peak runoff rate from the 1-year storm.

The Stormwater Impact Analysis shall comply with the requirements of the City Public Works Department Director or County Engineer, as appropriate. The City Public Works Department Director or County Engineer, as appropriate, shall determine the need for stormwater management facilities to address offsite impacts.

**Policy 9.4.4f. Engineered Stormwater Controls, County-Wide.** Engineered stormwater controls may be required for new development anywhere in the County at the discretion of the City Director of Public Works Department or the County Engineer, as appropriate, if the post-development peak runoff rate from the 2-year and 10-year storms increases ~~by more than 10 percent, such that there is no net increase.~~

**Policy 9.4.4g. Stormwater Management and Redevelopment.** The City Public Works and the City-County Planning Departments shall research and propose specific measures to remove disincentives to redevelopment associated with requirements for nutrient ~~nitrogen~~ reduction and stormwater management.

**Policy 9.4.4h. Stormwater Credit.** For new development other than single-family residential development, the City Public Works Department shall continue to offer a credit against the ratepayer's stormwater service fee for measures that ~~contribute to a reduction in~~ reduce peak discharge, ~~or an improvement in~~ improve water quality, ~~above and beyond requirements or for maintenance activities.~~

**Amended – June 2, 2014**

**Policy 9.1.2b. Future Water Supply Source.** The Department of Water Management shall continue to assess long-range water supply options to identify the most efficient alternatives to meet Durham's long-term water supply needs, evaluating, at a minimum, the following:

- i. Expand the capacity of Lake Michie by constructing a new, and higher, dam downstream of the existing dam, raising the lake's water pool elevation;
- ii. Develop a new water supply on either the Flat River or the Little River; and
- iii. Use Teer Quarry as off-line storage, filling from the Eno River and possibly other sources (Lake Michie and/or Little River).
- iv. ~~Obtain a water supply allocation from Kerr Lake.~~

**Policy 9.1.3a. Water Treatment Plant Capacity Expansion.** The Department of Water Management shall continue to plan for increasing additional water treatment plant capacity with a target date for construction to begin in late 2013. Capacity expansions shall include upgrades to the City's Brown Water Treatment Plant to provide for treatment of 42 million gallons per day. ~~Additional long term options may include construction of a new plant at Jordan Lake and purchase of treatment capacity from Cary.~~

**Policy 9.1.3d. Water Mains.** The ~~City Public Works~~ Department of Water Management shall continue to construct new water mains to meet distribution needs. Program projects for both new construction and rehabilitation shall be included in the annual Capital Improvements Program.

**Policy 9.4.4b. Stormwater Development Review.** The City Public Works Department and the County Engineering and Environmental Services Department shall continue to review new development proposals, specifically development plans, site plans, ~~and~~ construction drawings, and as-built drawings to ensure compliance with City of Durham or Durham County stormwater requirements, including:

- i. Stormwater impact assessment requirements for peak flow control in the 1-year, 2-year, 10-year, and ~~100-year storm~~ other design storm events;
- ii. Design of new best management practices (BMPs) to comply with requirements for watershed protection high-density option;
- iii. City of Durham stormwater performance standards, including Jordan, Falls, ~~and~~ Lower Neuse basin, and NPDES permit requirements; and
- iv. Impacts to riparian and floodplain areas to comply with requirements in the Unified Development Ordinance (UDO).

**Policy 9.4.4d. Required Stormwater Management Facilities and Improvements.** Through the Unified Development Ordinance and the Code of Ordinances, ~~require that~~, for any land-disturbing activity that results in a significant increase in stormwater discharge, the City Public Works Department Director or the County Engineering and Environmental Services Department Director, as appropriate, may require the developer to provide stormwater management facilities or make other improvements to the existing drainage system to address water quantity concerns, water quality concerns, or both if the proposed development will increase potential flood damages to existing properties or significantly increase pollutant levels in downstream receiving waters. The City Public Works Department Director or the County Engineering and Environmental Services Department Director, as appropriate, shall determine pollution source hotspots, including but not limited to trash compactors and vehicle wash facilities, that require higher levels of treatment.

**Policy 9.4.4f. Engineered Stormwater Controls, County-Wide.** Engineered stormwater controls ~~may~~ be required for new development anywhere in the County at the discretion of the City Director of Public Works Department or the County Engineer, as appropriate, if the post-development peak runoff rate from the 2-year and 10-year storms increases.

**Policy 9.4.4k. Alternative Stormwater Treatment.** The City Public Works Department, the County Engineering and Environmental Services Department, and the City-County Planning Department shall ~~develop and propose changes to the Unified Development Ordinance and other stormwater requirements to offer incentives for alternative stormwater treatment techniques, such as rain gardens, stormwater re-use, and natural stormwater retention areas.~~ keep current on the latest stormwater treatment technologies and standards accepted by the NC Department of Environment and Natural Resources (NCDENR), and shall investigate alternative stormwater treatment techniques such as rain gardens, stormwater re-use, and natural stormwater retention areas.

**Amended – October 3, 2016**

**Policy 9.2.2d. Sewer Service Extension Outside the Suburban Tier.** The City Public Works Department and the County Engineering Department shall continue to prohibit extensions of the sewer collection system outside of the Suburban Tier, except to properties with a verified existing health hazard from an on-site sanitary sewer system. Any extension of the City's sewer collection system outside of the City limits shall be ~~contingent upon approval by the City Council and shall be~~ contingent upon approval by the City Council and shall be in accordance with applicable codes, policies, standards and specifications of the City, which includes a voluntary annexation request to the City.

**Policy 9.4.1e. Re-evaluating Stormwater Management Level of Service Standards.** The City-County Planning Department, the City Public Works Department, and the County Engineering and Environmental Services Department shall re-evaluate the stormwater management level of service standards specifically seeking to address run-off associated with the ~~30-year~~ 25-year storm when considering changes to the *Unified Development Ordinance* to incorporate stormwater management requirements.

**Amended – November 6, 2017**

**Policy 9.4.4a. Sedimentation and Erosion Control.** The County Engineering and Environmental Services Department shall continue to regulate land-disturbing activity to control accelerated erosion and sedimentation in order to prevent the pollution of water and other damage to lakes, watercourses, and other public and private property. No person shall initiate any land-disturbing activity that uncovers more than 12,000 square feet without a Land Disturbance Permit or more than 20,000 square feet without having an erosion control plan approved by the Sedimentation and Erosion Control Office that:

- i. Identifies critical areas on the site subject to severe erosion and offsite areas vulnerable to damage;
- ii. Limits time of exposure;
- iii. Limits exposed areas;
- iv. Controls surface water originating upgrade of the exposed areas;
- v. Controls sedimentation; and
- vi. Manages stormwater runoff to control the velocity at the point of discharge to minimize accelerated erosion of the site and increased sedimentation of the stream.

(See Policy 7.1.2a. Sedimentation and Erosion Control.)



**Fully Implemented Policies**

Policy	Implementation Tool
9.1.1a. Well Water Level of Service Standard	Level of service standards are set by the NC Department of Environmental Quality (DEQ) and administered and enforced by the Durham County Health Department
9.1.4a. Low Intensity Land Uses	UDO, sections 4.11 and 8.7, and paragraphs 3.7.3, 3.14.9, 6.2.1, 6.9.1C, 8.5.4B
9.1.4b. Watershed Critical Areas and Land Use	sections 4.11 and 8.7, and paragraphs 3.7.3B, 3.14.9, and 6.2.1
9.1.4c. Impervious Surface Credit Transfer	UDO, section 8.7
9.1.4f. Stream Buffers	UDO, section 8.5
9.2.1c. On-Site Disposal System Level of Service, Nutrient Export Limits	Chapter 14, Article V of the Durham County Ordinances and the City of Durham’s Falls Lake Nutrient Management Strategy, Jordan Lake Nutrient Management Strategy, and Neuse River Basin Nutrient Management Strategy
9.3.2a. Reclaimed Water Pilot Program	City’s Reclaimed Water Master Plan
9.3.2b. Bulk Reclaimed Water	Bulk reclaimed water system upgrades at the North Durham WRF and South Durham WRF system.
9.4.1b. Water Quality Level of Service Standard, Nutrient Export Limits	Chapter 14, Article V of Durham County Ordinances and the City of Durham’s Falls Lake, Jordan Lake, and Neuse River Basin Nutrient Management Strategies.
9.4.2a. Development Regulation	UDO, Article 8
9.4.2b. Stream Buffers	UDO, section 8.5
9.4.4c. Stormwater Impact	UDO, section 12.8 and paragraphs 8.5.2, 8.5.3, and 8.7.2D
9.4.4d. Required Stormwater Management Facilities and Improvements	UDO, section 12.8 and paragraph 9.5.1
9.4.4e. Engineered Stormwater Controls, Neuse River Basin	UDO, section 8.5
9.4.4f. Engineered Stormwater Controls, County Wide	UDO, section 8.5
9.4.4i. Low Impact Design in Watershed Critical Areas	UDO, sections 4.11, 8.5, 8.7, and 12.8
9.4.4j. Floodplain Developments	UDO, section 8.4

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