

Town of Cary Water Shortage Response Plan

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Purpose: To establish measures and procedures for reducing potable water use during times of water shortage.

In 1996 the Town established a comprehensive water conservation program designed to effectively manage Cary's long term water resources. The established goals for the program are to support the high quality of life in Cary by providing safe, reliable water service, while reducing per capita use of potable water, conserve a limited natural resource, and reduce the costs of infrastructure expansion. To achieve these goals the comprehensive water conservation program includes regulatory, educational, and financial incentive components. The regulatory component primarily consists of three year-round water conservation ordinances: Section 36-80, Water Service Provided by Town Includes only Alternate Day Outdoor Irrigation; Section 36-83, Waste While Watering Ordinance, 36-84 Rain Sensor Ordinance. There are also irrigation system design requirements included in the Land Development Ordinance. The fundamental educational initiatives are school lessons; the annual Beat the Peak Campaign, The Block Leader Program, and the Town's Web pages. The primary financial incentive is the Town's tiered rate structure.

In contrast to Cary's long-term water conservation program, the purpose of this Water Shortage Response Plan (WSRP) is to deal with short-term or immediate water shortage, which may be caused by things such as drought, water quality problems, or disruptions in facility operations. The Town of Cary has been required by the state to have a WSRP since 2001 by both our Jordan Lake Allocation water supply contract and our interbasin transfer certificate. More recently, as of July 1, 2009 all public and privately owned water systems subject to GS 143-355 (l) are required to have an approved WSRP as part of their Local Water Supply Plan (LWSP). Rules governing water use during droughts and water emergencies (15A NCAC 02E. 0607) stipulate specific items that must be included in those plans. This WSRP was developed in accordance with the *Water Shortage Response Plan Guidelines* provided by the Division of Water Resources (January 2009).

I. Authorization

The Cary Town Manager, and in his or her absence the Assistant Town Manager, is authorized by Section 36-81 of the Town Code of Ordinances to declare a Water Shortage and to enact water shortage response provisions. References in this

document to the Town Manager apply to the Assistant Town Manager in the Town Manager's absence.

II. Notification

Once a Water Shortage has been declared, and whenever the Water Shortage Response Stage (defined in Section IV below) changes, the following notifications will be made:

1. A notice of the effective date of the declaration and the current water use reduction state will be posted at Town Hall.
2. The Town Manager (or designee) notifies the Mayor, Town Council, neighboring municipal contract water recipients, and town government departments.
3. The Public Information Officer (or designee) will contact the media. The media, including television, print, internet, and radio, will inform the public. Contact information for the Public Works & Utilities Department will be provided for additional information needed by the public.
4. The Public Information Officer (or designee) will update the Town's Web site with the Water Shortage status.
5. The Public Works & Utilities Director (or designee) will contact Finance Customer Service and the Water Distribution System Operator, and distribute a general e-mail so Town employees can help provide accurate information to the public.
6. Finance Customer Service will contact major water customers (both irrigation and water accounts) and inform them of the implemented measures.
7. The Water Distribution System Operator will contact the police communications center, and coordinate with bulk users.
8. The Town will directly notify both residential and non-residential customers of water restrictions via mail and/or e-mail when a water shortage is declared and when a new more restrictive stage is implemented. In addition, Town staff will email the information to irrigation contractors listed on a notification list maintained by water conservation program staff.
9. Water conservation staff will provide PWUT field employees with handouts to give customers who ask them questions as they work throughout the community.

During drought periods when declaration of a water shortage appears likely, the Town will keep customers informed of the potential for declaring a water shortage, and will provide information to customers via public service announcements and the Web site about measures they can take to reduce water use and, potentially, avoid a water shortage situation.

III. Drought Contingency Plans for Non-residential Customers

Non-residential customers are encouraged to prepare for a water shortage by determining the measures they would implement to meet the requirements of the Water

Shortage Response stages described in Section IV. This can be accomplished by developing a Drought Contingency Plan during normal water supply conditions before there is a water shortage situation. Customers who use relatively large amounts of potable water and/or use potable water for public health purposes (e.g. hospitals or assisted living facilities) are especially encouraged to develop a Drought Contingency Plan well in advance of a potential water shortage situation. Resources available for assistance with developing a plan include the NCDENR Division of Pollution Prevention, which published the “Water Efficiency Manual for Commercial, Industrial and Institutional Facilities” in May 2009, and Waste Reduction Partners. The manual and more information are available at www.p2pays.org, or call (919) 715-6500 or (800) 763-0136.

If, after developing a Drought Contingency Plan, a customer believes that meeting the default water use reduction requirements will compromise public health and safety or cause extreme hardship, the customer can submit a Drought Contingency Plan as described below to the Town’s Water Conservation Program Coordinator (or designee) for approval. An approved Drought Contingency Plan can then be used – and must be followed - in lieu of meeting the default requirements included in Section IV for non-residential customers.

To be considered for approval a Drought Contingency Plan must include:

1. Estimated amount of potable water use per day, during both an average winter month and an average summer month, for different purposes including drinking water, basic sanitation, process water, irrigation, and other major uses specific to the customer
2. Description of any alternate water sources available
3. Description of existing high-efficiency fixtures, technologies, hardware, management practices, or other measures in use to reduce water use.
4. Measures that would be taken during each Water Shortage Response stage in order to meet the requirements in Section IV.
5. Description of the impact to the customer or to the public (e.g. reduced production, reduction of business hours, employee impacts, structural damage, etc.) of meeting the water use reduction requirements.
6. Proposed alternative measures to be taken during each Water Shortage Response stage, and the resulting expected reduction in water use for the categories listed in item 1, under both average winter and average summer conditions.

Non-residential customers with an approved Drought Contingency Plan must resubmit their plan for approval every five years, or sooner if there is a significant change in water use or other conditions which would alter the plan’s effectiveness.

IV. Water Shortage Response Stages

Four water shortage response stages, intended to achieve system-wide water use reduction, are described below and summarized in Table 1. Before Stage 1 is implemented, the Town will communicate to each customer a summary of the

customer's historical water use, their normal Tier 1 indoor water use, and information on how much water can be saved with different water use reduction measures.

Non-residential customers who have an approved Drought Contingency Plan must reduce water use during each stage as specified in their plan.

Stage 1

Spray irrigation using potable water is limited to one (1) day per week for all purposes except the maintenance of athletic fields. No new turf watering exemption permits will be issued and any existing permits for watering periods that begin later than 14 days after the effective date of Stage 1 will be rescinded. Hand watering, drip irrigation, and subsurface irrigation are still allowed. Other outdoor water uses such as pressure washing, car washing, and keeping swimming pools filled are allowed, although customers are strongly encouraged to minimize such uses.

Stage 2

Spray irrigation using potable water is not allowed for any purpose except the maintenance of athletic fields. No new turf watering exemption permits will be issued, and any previously issued exemption permits for watering periods that have not expired will be rescinded. Hand watering, drip irrigation, and subsurface irrigation are still allowed. Other outdoor water uses such as pressure washing, car washing, and keeping swimming pools filled are allowed, although customers are strongly encouraged to minimize such uses.

Stage 3

No outdoor water use with potable water is allowed, including but not limited to: spray irrigation, hand watering, drip irrigation, and subsurface irrigation, ornamental fountains, car washing, pressure washing, and keeping swimming pools filled. No new turf watering exemption permits will be issued and any previously issued permits for watering periods that have not expired will be rescinded. Firefighting and utility system maintenance are the only allowable outdoor water uses.

All customers are required to limit their monthly water use to the amount they normally use during the winter within Tier 1. This amount will be provided to each customer by the Public Works and Utilities Department, based on the water use history for their account, well in advance of Stage 3 implementation. For example, if during the winter a residential customer uses 4,000 gallons per month, then 4,000 gallons per month will be their normal Tier 1 indoor water use; if a customer normally uses 6,000 gallons per month in the winter - 5,000 Tier 1 and 1,000 Tier 2 – then their normal Tier 1 indoor water use will be 5,000 gallons per month. The approach will be the same for non-residential customers even though the maximum number of gallons based on the threshold between Tier 1 and Tier 2 varies for individual customers.

Rationing

In this stage, the goal is to ensure there is drinking water available to protect public health (e.g., health care, drinking water, basic sanitation). Customers are encouraged to use the minimum amount of water needed for public health protection. No outdoor

water use with potable water is allowed, including but not limited to: spray irrigation, hand watering, drip irrigation, and subsurface irrigation, ornamental fountains, car washing, pressure washing, and keeping swimming pools filled. As in Stage 3, no new turf watering exemption permits will be issued and any previously issued permits for watering periods that have not expired will be rescinded. Firefighting and utility system maintenance are the only allowable outdoor water uses.

All customers are required to reduce their normal Tier 1 indoor water use, calculated as defined above in Stage 3, by 15%.

Table 1: Water Shortage Response Stage Summary

	Year-round Water Conservation Program	Water Shortage Response Stages			
		Stage 1	Stage 2	Stage 3	Rationing
Outdoor Spray Irrigation	Three days per week	One day per week	None	None	None
Hand watering, drip irrigation, subsurface irrigation, athletic field maintenance	Allowed	Allowed	Allowed	None	None
Other outdoor water use such as pressure washing, car washing, filling/topping off swimming pools	Allowed	Allowed	Allowed	None	None
New Turf Watering Exception Permits	Allowed	No new permits issued, permits beginning more than 14 days after stage 1 date rescinded	None	None	None
Indoor Water Use Restrictions ¹	None	None	None	Limited to normal Tier 1 indoor use	Reduce normal Tier 1 indoor use by 15%

¹ Non-residential customers with an approved Drought Contingency Plan will follow the steps in their Plan.

V. Water Shortage Response Triggers for Chronic Conditions

Triggers are conditions which, when reached, cause a water shortage response stage to be implemented. Triggers are based on the ability to meet water demands and are influenced by several components of the Town’s water supply system: the water source (Jordan Lake and/or purchase from others), raw water intake and pipeline, treatment plant, storage tanks, and distribution system. Town staff and the Town Manager continually evaluate the status of all these components to determine if a water shortage condition exists or is approaching.

Cary and Apex have a joint allocation of water supply storage volume in the Jordan Lake Water Supply Pool equal to 32 percent of the water supply pool or 14,656 acre-feet (4,778 million gallons). Morrisville holds a water supply storage allocation equal to 3.5 percent of the water supply pool or 1,603 acre-feet (523 million gallons). Wake County (on behalf of RTP South) holds a water supply storage allocation equal to 3.5 percent of the water supply pool or 1,603 acre-feet (523 million gallons). Cary staff track the amount of water in storage in each of these water supply allocation pools on a daily basis, using daily and monthly water use records along with daily lake inflow and outflow estimates obtained from the US Army Corps of Engineers.

The triggers that would initiate a water shortage declaration from the Town Manager, and cause changes in the Water Shortage Response Stages as conditions worsen or improve, are based on the number of days of water supply available to meet potable water demands. The days of water supply remaining is calculated by dividing the working supply volume by the moving 30-day average daily demand. The working supply volume is defined as the amount currently stored, and accessible without permitting or capital improvements, in the combined Cary/Apex, Morrisville, and Wake County (for RTP South) Jordan Lake water supply storage allocations. The moving 30-day average daily demand is the total demand from customers in the Towns of Apex, Cary, and Morrisville, and RTP South.

$$\text{Days of Supply Remaining} = \frac{\text{Working Supply Volume}}{\text{Moving 30-Day Average of Daily Demand}}$$

Table 2 describes the triggers for entering the increasing stages of Water Shortage Response as conditions worsen and the Days of Supply Remaining is declining. The Director of Public Works and Utilities (or designee) will advise the Town Manager, in writing, when a trigger has been reached for issuance of a water shortage declaration or increasing the water shortage response stage. The Manager (or designee) shall then implement the appropriate water shortage response stage by issuing a declaration to take effect within 10 days of the date when the trigger was reached. The Town Manager may, based on other factors (described below), declare a Water Shortage or implement stages before a trigger is reached (sooner than Table 2 would indicate) if Days of Supply are declining or other conditions are worsening.

Table 2: Water Shortage Response Triggers for Declining Days of Supply Remaining

Stage	Triggers When Days of Supply Remaining is Declining
(Water Shortage declared) Stage 1	Days of Supply Remaining is 120 days or less
Stage 1 to Stage 2	Stage 1 has been in place for 28 continuous days AND Days of Supply Remaining is 90 days or less
Stage 2 to Stage 3	Days of Supply Remaining is 60 days or less
Stage 3 to Rationing	Days of Supply Remaining is 30 days or less

Table 3 describes the triggers for moving out of Water Shortage Response stages as conditions improve and the Days of Supply Remaining increases. The Director shall advise the Manager, in writing, when a trigger has been reached for decreasing a water shortage response stage or ending a water shortage declaration. Based on the written notification that a trigger has been reached, the Manager, in his discretion, may issue a declaration decreasing the water shortage response stage or ending a water shortage declaration. Based on other factors (described below), the Manager may elect to move out of a stage after a trigger is reached (slower than Table 3 would indicate).

Table 3: Water Shortage Response Triggers for Increasing Days of Supply Remaining

Stage	Triggers When Days of Supply Remaining is Increasing
Rationing to Stage 3	Days of Supply Remaining has been at least 60 days for at least 14 continuous days
Stage 3 to Stage 2	Days of Supply Remaining has been at least 90 days for at least 14 continuous days
Stage 2 to Stage 1	Days of Supply Remaining has been at least 120 days for at least 14 continuous days
Water Shortage ended	Jordan Lake Water Supply allocation has been 100% full for at least 14 continuous days

Other factors considered may include but not be limited to:

- Jordan Lake elevation
- US Army Corps of Engineers' operation of Jordan Lake in drought contingency mode
- Indications of short or long-term water quality concerns regarding Jordan Lake or other sources.
- Level of interbasin transfers relative to the Cary/Apex, Morrisville/Wake County interbasin transfer certificate amount.
- Drought Advisory issued by the NC Drought Management Advisory Council.
- Sudden loss of supplemental water supplies during periods of high demand.

VI. Water Shortage Triggers and Response for Acute Conditions

Events such as contamination, equipment or facility failure, or line breaks require a swift and immediate response. Examples of conditions that may result in an immediate water shortage include:

- The occurrence of a major water transmission main break, fire, or any other emergency that would require high volumes of water, such that demand could exceed supply.
- Accidental or intentional contamination of the water system.
- Mechanical failure in the water treatment plant or distribution system.

- Inability to distribute water through part of the system.

The following Standard Operating Procedures identify protocols Town staff follow when these circumstances arise:

OPS #007, De-chlorination Procedure for Water Distribution System Flushing and Main Break or Reclaimed Water System Main Break

OPS #008, Water Main and Service Line Breaks

OPS # 010, Water Transmission Main Shut Down

OPS #015 Water Main Break by Contractor

OPS #017 Fecal Coliform-E.coli/Contamination Response

In addition, an Emergency Response Plan, kept confidential for security purposes, identifies detailed procedures to follow should an emergency of that magnitude happen. Upon recommendation of the Director, the Town Manager may declare a water shortage and implement any water shortage response stages or other measures as he or she deems appropriate for any such immediate water shortage situation.

VI. Enforcement

Compliance with the requirements of the Water Shortage Response Plan is required by the Water Shortage Ordinance (Section 36-81). Penalties are specified annually in the Budget Ordinance (Operating Budget Fee Schedule, Public Works and Utility Fees).

The Town has Water Conservation Technicians who regularly enforce our year-round water conservation ordinances, which address outdoor water use and water waste. During a water shortage, these staff members will continue their enforcement of outdoor water use restrictions, and other staff members may also be used as needed to achieve the desired system-wide water use reductions. During a water shortage, in contrast to during normal times, there will be no warnings before fines are issued for non-compliance with outdoor water use restrictions, and, the fines are higher than during normal times. However, the fine for a first-time violation will be deferred and either 1) waived at the end of the water shortage if there is not a second violation or 2) added to the fine for a second violation if that occurs.

Reductions in indoor water use are not required in Stages 1 and 2, but the amount of reductions that may be occurring voluntarily will be evaluated using monthly water billing usage data. Compliance with the required indoor water use reductions in Stage 3 and Rationing will be monitored during monthly meter reads at a minimum, and Town staff will audit water use more often as conditions warrant and/or if expected overall system water use is not decreasing as needed.

VII. Variance Protocols

The Town recognizes that the requirements for water use reduction in Table 1 may have significantly more impact on some customers than on others and in some cases could affect public health and safety. To be considered for a variance, customers may submit a letter requesting the variance to the Public Works and Utilities Director. The letter must include an explanation of why the requirements in Table 1 are not appropriate, cause extreme hardship, or affect health and safety. The letter should include proposed water use reductions for each stage and an explanation of why they are more appropriate.

A decision to approve or deny variance requests will be based upon consideration of criteria including but not limited to: impact on water demand, expected duration of water shortage, alternative source options, social and economic importance of water use, purpose of water use (i.e., necessary use of drinking water) and the prevention of structural damage.

VIII. Expected Effectiveness

The effectiveness of the Town of Cary Water Shortage Response Plan will be determined by measuring system-wide water use reduction. Variables other than water use restrictions that may impact reduction goals will be considered. Some of these include frequency of plan activation, any problem periods without activation, total number of violation citations, desired reductions attained and evaluation of demand reductions compared to historical data. Table 4 indicates the potential expected

reduction from normal use for each stage, depending on the time of year, developed using 2007 customer billing records.

Table 4: Expected Water Use Reductions

Water Shortage Response Stage	Expected Approximate Reductions Relative to Normal Water Use	
	May through October	November through April
Stage 1	13%	6%
Stage 2	32%	10%
Stage 3	38%	17%
Rationing	46%	29%

IX. Revision

The WSRP will be reviewed if there are new circumstances affecting water supply and demand, and following any Water Shortage declaration. The WSRP will be updated if indicated after a review, or at a minimum every five years as required by the provisions of GS 143-355 (l) and when our Local Water Supply Plan is updated. The Town of Cary Public Works and Utilities Director (or designee) is responsible for initiating all WSRP updates.

X. Public Comment

This WSRP was prepared based on public input received via an on-line survey (available for one month; 91 participants), emailed comments, and at an Open House held April 29, 2009. Subsequent revisions of the Water Shortage Response Plan will go through the normal processes for approval at regular meetings of the Town Operations Committee and then of the Town Council. The proposed WSRP revisions will be publicized as part of the meeting agendas.