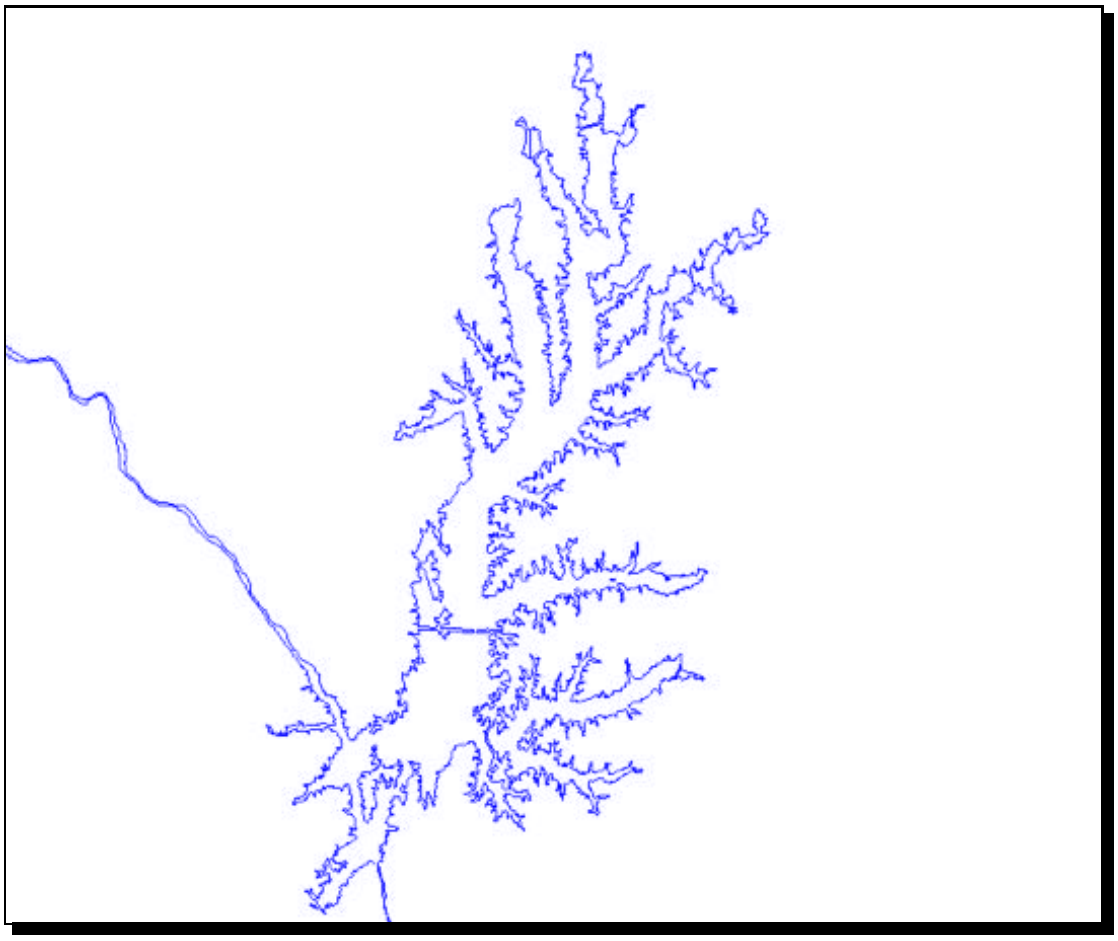
JORDAN LAKE WATER SUPPLY STORAGE ALLOCATION RECOMMENDATIONS

ROUND THREE



October 2001

Division of Water Resources
Department of Environment and Natural Resource

EXECUTIVE SUMMARY

The State of North Carolina has purchased the use of the entire water supply storage in B. Everett Jordan Lake. Under GS 143-354(a)(11) the State can assign this storage to any local government demonstrating a need for water supply storage. Administrative rule T15A: 02G.0500 describes the specific procedures to be used when allocating the Jordan Lake water supply storage. The two main criteria for Jordan Lake water supply allocations are future water needs and availability of alternative water supplies.

On July 13, 2000, the Environmental Management Commission (EMC) directed the Division of Water Resources to open Round Three of Jordan Lake water supply storage allocations, concurrent with the completion of Round Two. The EMC further directed the Division to develop a Cape Fear River Basin Water Supply Plan to determine whether there are adequate supplies in the Basin for all communities through 2050.

Round Three of Jordan Lake water supply storage allocations has benefited from experience with the first two rounds, and from the suggestions of water supply system managers. Round Three has been characterized by:

- Extensive early consultation with potential applicants to establish uniform methods of projecting future water needs;
- Use of a longer planning period (thirty years) to give applicants a more secure basis for their water system development plans;
- Consideration of water supply needs of all communities relying upon water from above Lock & Dam #1 through 2050 to assure that Jordan Lake allocation recommendations are compatible with long range water needs throughout the Cape Fear River Basin; and
- Use of the Cape Fear River Basin Hydrologic Model to evaluate the effects of future water use scenarios.

The Division of Water Resources took advantage of the extensive information available to project water supply needs in the Cape Fear River Basin through 2050 and to develop a Cape Fear River Basin Water Supply Plan. Information sources included Local Water Supply Plans, water use registration data, and water use estimates from the development of the Cape Fear River Basin Hydrologic Model. We had to make some assumptions to develop the 2050 projections. We grouped water supply systems by existing interconnections to determine if the water sources available for each group were adequate for that group's future water needs. With the exception of three small communities not affected by water use from Jordan Lake, there seems to be an adequate supply for basin-wide water needs through 2050.

The Division of Water Resources will invite local governments and other water users to review the data and assumptions that we used in the Cape Fear River Basin Water Supply Plan and to improve the plan by providing us with more specific information about their water supply intentions. We hope that the Basin's water users will "take ownership" of the plan, that the plan will be periodically updated, and that the plan will provide a guide for water management in the Basin. Note that the Cape Fear River Basin Water Supply Plan is the Division's attempt to provide a plausible review of the Basin's ability to meet future water supply needs, but that the

assumptions contained in the plan are not policy statements and that the plan has no regulatory force.

Excerpts from the Cape Fear River Basin Water Supply Plan are contained in Appendices B and C. The Division of Water Resources will provide more complete documentation of the plan and hold a workshop on the plan by December, 2001, well before the public hearing on the Round Three Jordan Lake water supply storage allocation recommendations.

The Division of Water Resources' allocation recommendations are summarized below and further illustrated in Table 1. The recommended allocations are based on projected needs in 2030, and are compatible with the projected needs of all water supply systems in the Cape Fear River Basin through 2050. The following is a list of those that submitted an application for an allocation, and the Division of Water Resources' recommendations:

1. Chatham County – no change in existing 6.0 mgd allocation;
2. City of Durham – allocating 10.0 mgd;
3. City of Fayetteville – no allocation;
4. City of Sanford – no allocation;
5. Harnett County – no allocation;
6. Town of Holly Springs – decrease the current 2.0 mgd allocation to 0.0 mgd;
7. Orange Water and Sewer Authority – decrease current 10.0 mgd allocation to 5.0 mgd;
8. Orange County – no change in existing 1.0 mgd allocation;
9. Towns of Cary and Apex – allocating an additional 11.0 mgd for a total of 32.0 mgd;
10. Town of Morrisville – allocating an additional 1.0 mgd for a total of 3.5 mgd; and
11. Wake County/Research Triangle Park – allocating an additional 2.0 mgd for a total of 3.5 mgd.

Some of the key features of these recommended water supply storage allocations are:

- All allocation applicants will have their projected 2030 water needs met either from Jordan Lake or from their existing water supply sources.
- These recommendations leave 39 percent of the water supply pool unallocated and available to meet future water needs. Of the 50 percent of the Lake's water supply storage that may be allocated for use outside of the Lake's watershed under current policy, at least 10 percent remains unallocated and available for future water needs.
- Based on a projection of all Basin water supply needs to 2050, the recommended allocations will not hinder any community's ability to meet its 2050 water needs.
- Applicants requested allocations to meet 2050 needs, plus a 20 percent margin. The Division of Water Resources recommended allocations to meet only 2030 needs, as specified in the administrative rule.
- We based our recommended allocations on the water use projections developed by each applicant with one exception. We adjusted Chatham County's assumed per capita water use rate to bring it more in line with the rates used by other applicants.
- No additional interbasin transfer certificates are required for the recommended allocations.
- The US Congress authorized one-third of the Jordan Lake conservation pool to be used for water supply and two-thirds for downstream flow augmentation. Water supply storage allocations come from the water supply pool and do not affect the project's ability to meet downstream flow targets.

Level I allocation holders are required to pay a proportional share of the state's water supply storage capital and interest costs. Level I allocation holders are also required to pay annually a proportional share of operating costs. Level II allocation are required to pay annually a proportional share of the project's water supply storage interest and operating costs. Holly Springs and OWASA hold Level II allocations. The Division of Water Resources recommends reimbursements only of payments toward capital costs when allocations are reassigned. Therefore, we recommend no reimbursement of payments made by OWASA or Holly Springs.

Table 1. Jordan Lake Water Supply Storage Allocations for Round Three [(a)]

Applicant	**Current Total Allocation** (mgd)	**Requested Total Allocation** (mgd)	**Recommended Total Allocation** (mgd)	**Interbasin Transfer Certification Required**
Chatham County	6.0	10.5	6.0	No
City of Durham	0	20.0	10.0	No
City of Fayetteville	0	not specified	0	No
City of Sanford	0	28.0	0	No
Harnett County	0	18.0	0	No
Town of Holly Springs	2.0	16.0	0	No
OWASA	10.0	5.0	5.0	No
Orange County	1.0	1.0	1.0	No
Towns of Cary and Apex	21.0	44.0	32.0	No
Town of Morrisville	2.5	5.0	3.5	No
Wake County/ Research Triangle Park	1.5	5.5	3.5	No
Total	**44.0**	**153.0**	**61.0**	

(a) Allocations obtained are actually a percentage of the water supply storage in Jordan Lake. However, since all (100 percent) of the water supply storage has an estimated safe yield of 100 mgd, allocations are conveniently expressed here in terms of mgd. For example, a 6.0 mgd allocation actually represents an allocation of 6.0 percent of Jordan Lake's water supply storage.

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BACKGROUND

The State of North Carolina has purchased the use of the entire water supply storage in B. Everett Jordan Lake. Under GS 143-354(a)(11), the State can assign this storage to any local government having a need for water supply storage. Administrative rule T15A: 02G.0500 describes the specific procedures to be used when allocating the Jordan Lake water supply storage. The two main criteria for Jordan Lake water supply allocations are future water needs and availability of alternative water supplies.

On July 13, 2000, the Environmental Management Commission (EMC) directed the Division of Water Resources (DWR) to open Round Three of Jordan Lake water supply storage allocations, concurrent with the completion of Round Two. The EMC further directed the Division to develop a Cape Fear River Basin Water Supply Plan to assist in evaluating applications and to provide recommended Jordan Lake allocations to the Water Allocation Committee.

METHOD

In the fall of 2000, the Division of Water Resources staff held a series of meetings with potential applicants and other interested parties to discuss the application process and the data required to evaluate allocation requests and long-term water supply needs. During December 2000 and January 2001, We received draft applications from all applicants, except the Chatham County and Harnett County water systems. We carefully reviewed the draft applications and offered comments and suggestions to improve final applications. In May 2001, we received eleven. Most of our comments on the draft applications were addressed in the final applications, simplifying the review of final applications.

Round Three applications included projections of water demands to 2050. We also developed estimates of 2050 demands for the local government water systems in the basin that did not apply for an allocation. For non-applicants, we relied on the Local Water Supply Plan (LWSP) database and linear projections of population through 2050. We estimated future demand for those systems by applying water use rates from LWSPs to our population projections. We analyzed all the systems, determining the interconnections among systems and the amounts of water being transferred. We then grouped systems based upon their interconnections. We determined that the total projected demands for each group of systems could be met by the total available supply reported for each group. In short, there seems to be an adequate water supply within the basin to meet projected 2050 water demands, ensuring that any allocation of Jordan Lake water supply storage will not undermine the ability of any water supply system in the Cape Fear River Basin to meet its projected water demands.

We used the Cape Fear River Basin Hydrologic Model to evaluate requests for allocations from Jordan Lake and to evaluate long-term water supply needs in the basin. To do so, we developed two modeling scenarios. Scenario 1 evaluates the long-term water supply needs in the basin projected for 2050. Scenario 2 evaluates the basin water supply needs and recommended Jordan Lake water supply storage allocations for 2030. Lacking definitive information, we assumed that wastewater discharge permits would be adjusted to accommodate

the amount of wastewater generated by the projected water demands for all water supply systems. We did not incorporate any drought management measures for Jordan Lake withdrawals or releases or for any water supply withdrawals for these scenarios. We assumed that self-supplied industrial withdrawals and agricultural withdrawals would remain constant.

To evaluate the long-term water supply needs in the Cape Fear River Basin and the cumulative effects of these demands throughout the basin above Lock & Dam #1 for Scenario 1, we incorporated the maximum demands for the Basin's water supply systems in 2050. Therefore, we used the projections as provided in the Jordan Lake applications without making any adjustments based on our application evaluations. In designing Scenario 1, we incorporated future Jordan Lake water supply storage allocations based on 2050 projected needs. These hypothetical 2050 allocations are necessary for modeling and for long-range planning, but do not reflect any intention by DWR or the EMC. **No one should assume that the Division of Water Resources would recommend or that the EMC would make any such allocations**.

To evaluate the Basin water supply needs and recommended Jordan Lake water supply storage allocations for 2030, and the cumulative effects of these demands throughout the basin above Lock & Dam #1 for Scenario 2, we incorporated the same projections used for Scenario 1 adjusted for 2030 with the following exception. For Scenario 2, we adjusted the projected water demands for Chatham County, Siler City and Pittsboro based upon our evaluations of all Jordan Lake water supply storage applications. Our application evaluations are described in later sections.

MODEL SCENARIO RESULTS

Model scenario results indicate that, with a couple of exceptions, there is enough water to meet the projected needs in 2050 without significant effects on the reliability of the Jordan Lake low-flow augmentation pool, the ability to meet the flow target at the Lillington stream gage, or downstream flows of the Cape Fear River. The aforementioned exceptions concern the towns of Robbins, Carthage and Vass. The present water supply sources of these towns may not reliably meet their projected demands in 2030. Note that Jordan Lake water supply storage allocations do not impact the water supplies available to these communities in any way.

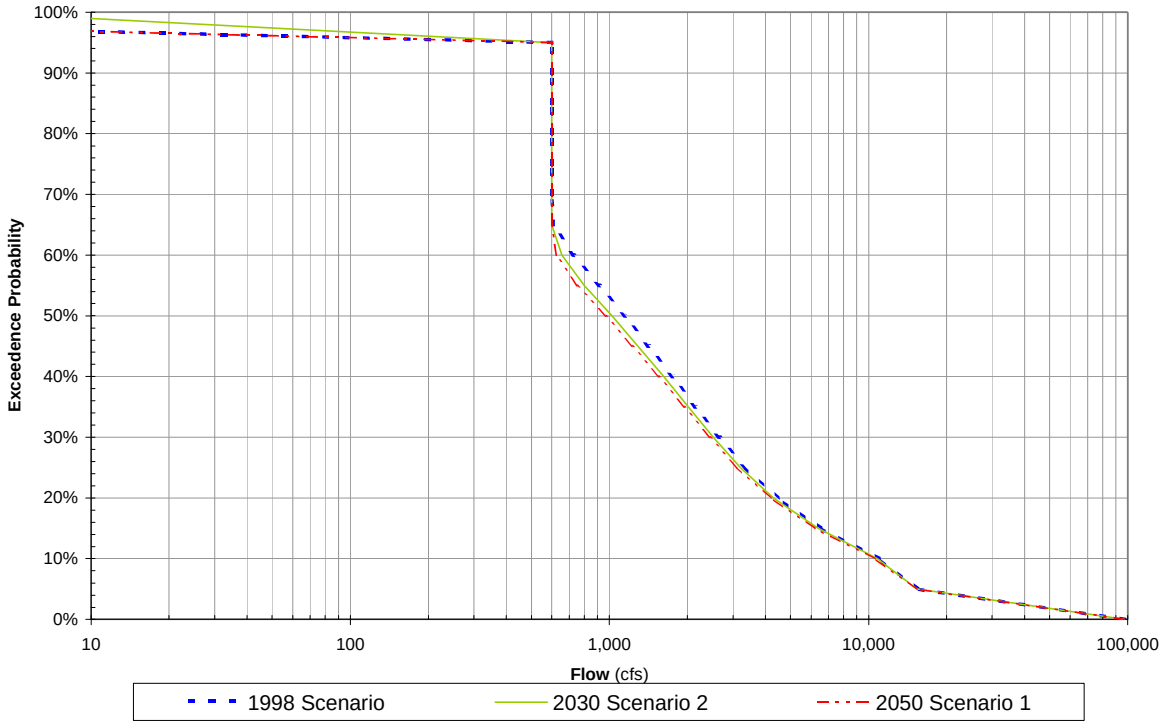
About two-thirds of the usable storage in Jordan Lake is used for low-flow augmentation to improve water quality downstream. Water is released from the low-flow augmentation pool with the goal of maintaining a target flow of 600 cubic feet per second (cfs), plus or minus 50 cfs, at the stream gage at Lillington. This resource provides a minimum flow downstream of the dam significantly higher than pre-dam flows. Prior to the initiation of water releases from Jordan Lake the 7Q10 flow (lowest seven-day average flow with an expected recurrence interval of ten years) at Lillington was 75 cfs. For the period since the filling of Jordan Lake the US Geologic Survey (USGS) currently calculates the 7Q10 flow at 530 cfs.

Model scenario results indicate that the reliability of the low-flow augmentation pool will decrease by only 0.3 percent by 2030 and by 0.9 percent by 2050, compared with 1998. This decrease in reliability is a result of the large increases in projected demands for the water supply systems withdrawing water from the Deep River Basin and from between Jordan Dam and

Lillington. The total projected increase in these withdrawals is 65.8 mgd by 2030 (an increase of 201 percent compared with 1998 withdrawals) and 108.9 mgd by 2050 (an increase of 333 percent compared with 1998 withdrawals). This means that multiplying the total withdrawals of all water supply systems affecting the flows at Lillington by four-and-one-third results in less than a 1 percent decrease in the reliability of the low-flow augmentation pool. Note that these modeled impacts on reliability do not incorporate any drought management measures. Drought management will improve the reliability of the low-flow augmentation pool.

Model scenario results also indicate that the slight decrease in reliability will not significantly affect the ability to meet the flow target at the Lillington stream gage. The flow profile at Lillington remains almost unchanged among the model scenarios. See Figure 1, below.

Figure 1. Modeled Cape Fear River Flows at Lillington



Four of the Round Three applications are from water systems located downstream of Jordan Dam. Based on the information provided in their applications, we expect these systems to rely upon withdrawals from the Cape Fear River to meet their future water demands. Model Scenario 1 incorporates their 2050 projected water demands as given in their applications. The results of Scenario 1 indicate there will be adequate water available at their current or planned intake locations. Therefore, these systems (Sanford, Holly Springs, Harnett County, and Fayetteville) do not need an allocation from Jordan Lake to meet their projected water demands. Summary information and water use graphs for these systems are included in this report.

Some of the applications for the four downstream applicants included population increases greater than those made by DWR staff based on Department of Administration data and large assumed increases in industrial and other non-residential water uses. For this reason, the projections made by these communities can be assumed to be at the very high end of the

range of projected water use. However, because our review showed that these four water systems could meet their 2050 needs from the Cape Fear River without a Jordan Lake allocation, we did not subject data in these applications to the same level of scrutiny as we did the data provided by other applicants. We reviewed the remaining applications in detail. We checked the assumptions, use rates and calculations the applicants had used to develop demand projections for reasonableness and consistency with DWR's application guidelines. Final applications for those systems that submitted a draft application incorporated responses to DWR's comments on the draft application, simplifying our review. Each application will be discussed separately, including charts showing projected population, demand growth and any adjustments we made to the applicants' water demand projections.

ALLOCATION CRITERIA

The two main criteria for Jordan Lake water supply storage allocations are future water needs and availability of alternative water supplies. Applications submitted in May 2001 contained the following information:

- projected population and water use
- safe yield estimates of current and alternative sources
- description of conservation and demand management practices
- outline of plan to use water from Jordan Lake
- plan for monitoring water quality
- cost of developing water supply facilities at Jordan Lake
- costs of alternative sources of supply
- a commitment to assume costs of allocation

Water demand is computed on an average day basis to correspond with the Jordan Lake safe yield estimate, as well as the safe yield estimates of other water supplies. Applicants were asked to provide estimates of water supply needs through 2050. However, the rules governing allocation limit allocations to the expected amount of water needed within 30 years. Allocations in Round Three are based on projected average daily water demands in 2030.

Future Water Needs

Applicants provided estimates of water use for the period 2000 through 2050. The Division performed an independent analysis of future needs for all applicants. Our analysis considered factors affecting water demand, including:

- population growth
- service area expansion
- conservation
- unaccounted-for water use
- interconnections
- industrial development

In addition to analyzing applicants' projections, we estimated future service area population for other systems using water from the Haw, Deep and Cape Fear rivers through the year 2050. We based population projections on service area population projections from the

Local Water Supply Plan database and Office of State Planning projections of county population through 2020. We compared applicants' population projections with projected total county populations for each county in which an applicant is located.

Applicants' future water use rates included the effects of water conservation, industrial growth, and changing urban patterns. Expected changes in the proportions of residential and non-residential water use can affect water use rates. Conservation savings are expected to result from changes in plumbing codes, improved system maintenance, customer education, and adoption of water reuse.

We estimated future water use by multiplying estimated service population by the future per capita rates for non-applicants to look at expected demands of neighboring and inter-related systems.

Alternatives

Applicants were required to provide information on alternative water supplies that could be developed in lieu of a Jordan Lake allocation. Alternatives may include bulk purchases from other suppliers, new reservoir and well development, and reservoir expansion. The list of alternatives should have included all potential sources that the system had previously evaluated, or potential sources that might be easily evaluated. Systems were not required to perform extensive feasibility studies of new, potential supplies. The Division evaluated each alternative based on financial cost and the difficulty of developing the resource in comparison with a Jordan Lake withdrawal. The Division also considered the impact of each alternative on interbasin transfer and other environmental impacts.

ALLOCATION RECOMMENDATIONS

The Division of Water Resources' allocation recommendations are summarized below and further illustrated in Table 1. The recommended allocations are based on projected needs in 2030, and are compatible with the projected needs of all water supply systems in the Cape Fear River Basin through 2050. The following is a list of those systems that submitted an application for an allocation, and the Division of Water Resources' recommendations:

1. Chatham County – no change in existing 6.0 mgd allocation;
2. City of Durham – allocating 10.0 mgd;
3. City of Fayetteville – no allocation;
4. City of Sanford – no allocation;
5. Harnett County – no allocation;
6. Town of Holly Springs – decrease the current 2.0 mgd allocation to 0.0 mgd;
7. Orange Water and Sewer Authority – decrease current 10.0 mgd allocation to 5.0 mgd;
8. Orange County – no change in existing 1.0 mgd allocation;
9. Towns of Cary and Apex – allocating an additional 11.0 mgd for a total of 32.0 mgd;
10. Town of Morrisville – allocating an additional 1.0 mgd for a total of 3.5 mgd; and
11. Wake County/Research Triangle Park – allocating an additional 2.0 mgd for a total of 3.5 mgd.

The Division of Water Resources recommends that the State reimburse allocation holders for the amounts of principle they have paid on the original capital investment costs for any allocation amounts reassigned.

Table 1. Jordan Lake Water Supply Storage Allocations for Round Three [(a)]

Applicant	Current Allocation (mgd)	Requested Total Allocation (mgd)	Recommended Total Allocation (mgd)	Interbasin Transfer Certification Required
Chatham County	6.0	10.5	6.0	No
City of Durham	0	20.0	10.0	No
City of Fayetteville	0	not specified	0	No
City of Sanford	0	28.0	0	No
Harnett County	0	18.0	0	No
Town of Holly Springs	2.0	16.0	0	No
OWASA	10.0	5.0	5.0	No
Orange County	1.0	1.0	1.0	No
Towns of Cary and Apex	21.0	44.0	32.0	No
Town of Morrisville	2.5	5.0	3.5	No
Wake County/ Research Triangle Park	1.5	5.5	3.5	No
Total	**44.0**	**153.0**	**61.0**	

(a) Allocations obtained are actually a percentage of the water supply storage in Jordan Lake. However, since all (100 percent) of the water supply storage has an estimated safe yield of 100 mgd, allocations are conveniently expressed here in terms of mgd. For example, a 6.0 mgd allocation actually represents an allocation of 6.0 percent of Jordan Lake's water supply storage.

Watershed Diversions

The Jordan Lake watershed is that portion of the Haw River Basin upstream of Jordan Lake Dam. To protect the yield of Jordan Lake's water supply storage, the current administrative rule on Jordan Lake water allocation limits allocations that will result in diversions out of the Lake's watershed to 50 percent of the total water supply yield, or 50 mgd. This provision is specific to the Lake's watershed, because water returned below the dam does not replenish the reservoir. The EMC may review and revise this limit based on experience in managing the Lake and on the effects of changes in the Lake's watershed that will affect its yield.

This 50 mgd limit refers to annual average diversions, since yields are typically based on annual averages. Table 2 summarizes the estimated diversions out of the Lake's watershed,

based on the 2030 demand projections and the recommended allocation amounts. As shown, an estimated 40 mgd of the 61 mgd total recommended allocation would be diverted out of the Lake's watershed by 2030, leaving at least 10 mgd of the water supply storage still available for future allocations outside the lake's watershed under the current 50 mgd limit. This limit does not need to be revised for Round Three.

Table 2. Estimated 2015 Jordan Lake Watershed Diversions

Applicant	Total Recommended Allocation (mgd) [1]	2030 Watershed Diversion (mgd) [2]
Chatham County	6.0	1.3
City of Durham	10.0	0
OWASA	5.0	0
Orange County	1.0	1.0
Towns of Cary and Apex	32.0	31.3
Town of Morrisville	3.5	2.9
Wake County/ Research Triangle Park	3.5	3.5
TOTAL	**61.0**	**40.0**

[1] Includes existing allocation amounts
[2] Watershed Diversion is an estimate of the quantity of water withdrawn from Jordan Lake, but not returned to the Jordan Lake watershed. This quantity is on an Average Daily Demand basis.

Orange County does not currently have a water supply system, but anticipates supplying water to county residents through the Orange-Alamance water system. There is likely to be some amount of water withdrawn from the Jordan Lake watershed, but it is impossible to estimate the quantity. We have therefore set the quantity diverted from the watershed at the maximum possible. Wake County did not provide the information necessary to calculate the amount of water diverted from the Jordan Lake watershed. We have therefore set the quantity at the maximum possible. Our estimated 2030 watershed diversion of 40 mgd is likely to be greater than the actual amount.

Interbasin Transfer

Any amount of water over 2 mgd (calculated on a maximum day demand basis) withdrawn from one river basin and discharged to another river basin may constitute an interbasin transfer under the Regulation of Surface Water Transfers Act (GS 143-215.22I). For the purposes of our Jordan Lake water supply storage allocation recommendations, we are only concerned with those water withdrawals from a recommended Jordan Lake allocation that might constitute an interbasin transfer. The only water supply systems for which we have recommended Jordan Lake allocations that fall into this category are Chatham, Orange and Wake Counties, and the Towns of Cary, Apex and Morrisville. None of these systems will require a new interbasin transfer certificate.

Chatham County will have a projected interbasin transfer amount of 1.9 mgd if they supply the western portion of their county with water withdrawn from Jordan Lake. Jordan Lake lies within the Haw River Basin and the western portion of Chatham County lies within the Deep River Basin. This estimate is based on information provided within their application and on

information provided in the *Chatham County Water Feasibility Study Update* (Hobbs, Upchurch and Associates 2000). This projected amount is below the 2 mgd threshold. Therefore no interbasin transfer certificate will be required as a result of our recommended allocation for Chatham County.

Orange County will likely have some amount of interbasin transfer. The southern part of the county lies within the Haw River Basin and the northern part of the county lies within the Neuse River Basin. However, we have recommended maintaining their current allocation of 1.0 mgd. This allocation amount is unlikely to allow any withdrawal from Jordan Lake sufficient to constitute an interbasin transfer above the 2 mgd threshold. Therefore, no interbasin transfer certificate will be required as a result of our recommended allocation for Orange County.

Cary, Apex, Morrisville and Wake County were granted an interbasin transfer certificate in 2001 that allows them to transfer up to 24 mgd from the Haw River Basin to the Neuse River Basin, subject to several conditions. Therefore, no interbasin transfer certificate will be required as a result of our recommended allocations to Cary, Apex, Morrisville and Wake County.

APPLICANTS USING CAPE FEAR RIVER BELOW JORDAN DAM

If available supplies are adequate, then additional supplies, such as an allocation from Jordan Lake, will not be needed to meet projected water demands. The US Geological Survey recently completed a study of low-flow conditions in the Cape Fear River Basin, improving our estimates of the amounts of water available to systems on the Cape Fear River. USGS published *Water-Resources Investigations Report 01-4094: Low-Flow Characteristics and Discharge Profiles for Selected Streams in the Cape Fear River Basin, North Carolina, through 1998* in 2001. This document provides the low-flow figures that we used to estimate the available water supplies in this analysis.

City of Sanford

The City of Sanford withdraws water from the Cape Fear River approximately 10 miles downstream from Jordan Dam in the impoundment created by Buckhorn Dam. Sanford's 1998 withdrawal was 6.2 mgd and their projected 2050 withdrawal is 36.7 mgd. The Cape Fear hydrologic model scenario results indicate that there will be no difficulty in meeting Sanford's 2050 projected needs. The total projected increase in withdrawals upstream of Sanford is 75.6 mgd by 2030 (an increase of 72 percent compared with 1998 withdrawals) and 124.4 mgd by 2050 (an increase of 118 percent compared with 1998 withdrawals). Despite these large projected increases in upstream withdrawals, the model scenarios indicate that a 13.0 mgd increase in Sanford's withdrawal by 2030 (an increase of 210 percent compared with 1998) and 30.5 mgd increase by 2050 (an increase of 494 percent compared with 1998) result in only a 0.3 percent decrease in the reliability of their water supply by 2030 and a 0.7 percent decrease by 2050, compared with 1998. This minute decrease in reliability is a result of the large increases in projected demands for the water supply systems withdrawing water from the Deep and Haw River Basins, as well as the large projected increase in Sanford's withdrawal. Note that these modeled impacts on reliability do not incorporate any drought management for Jordan Lake or any water supply systems in the Basin. Drought management measures will improve the

reliability of water supplies. The table and graph below summarize the demand projections from Sanford's application.

It is important to note that the Cape Fear River Basin Hydrologic Model treats the stretch of river between Jordan Lake and Lillington as a free-flowing river, ignoring the water impounded by Buckhorn Dam. Therefore, the model does not accurately account for the return flows from the CP&L-Cape Fear power plant at the Sanford intake. The CP&L-Cape Fear plant withdraws water above Sanford and returns water above Buckhorn Dam, but below Sanford's intake. The return flows contribute to the amount of water available at Sanford's intake and would improve the reliability of Sanford's supply at the current location. The insignificant decrease in reliability indicated by the model scenarios is an artifact of modeling the waters impounded by Buckhorn Dam as a free-flowing stream segment. DWR determined that Sanford does not need an allocation from Jordan Lake to meet their anticipated water demands.

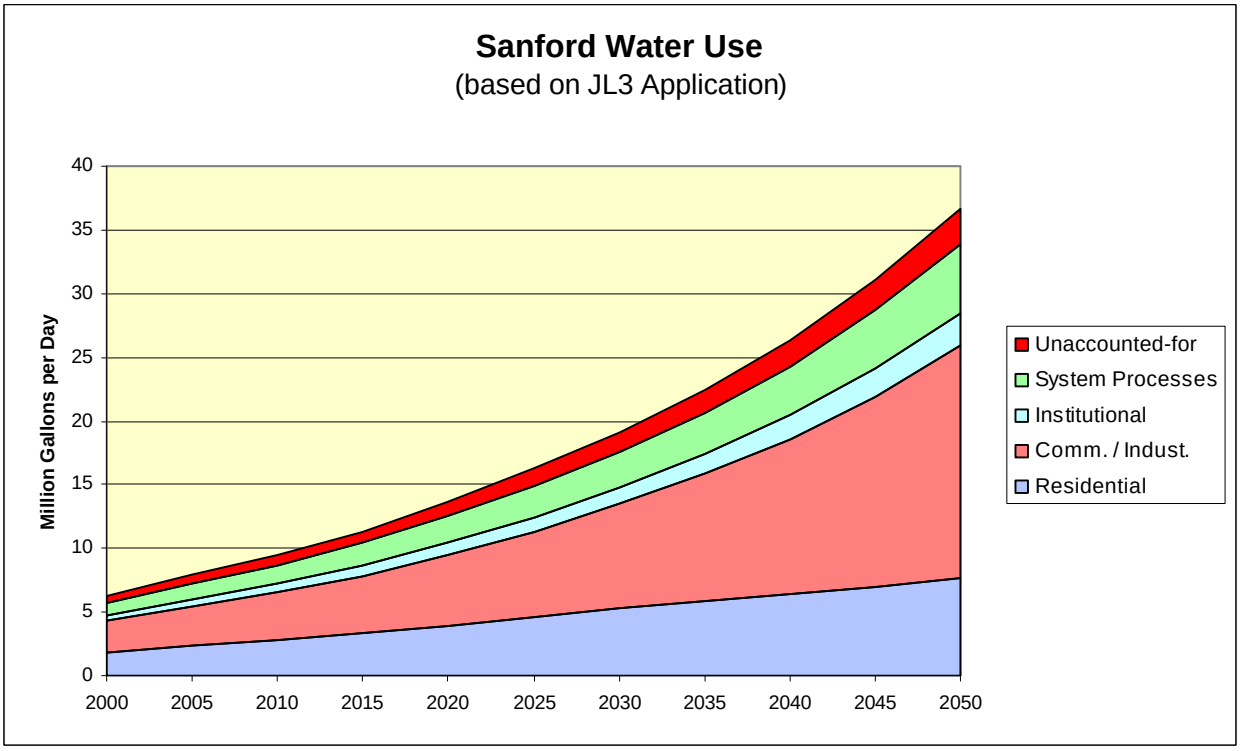
If Sanford does not receive an allocation, they will have no interbasin transfer associated with using water from Jordan Lake. However, they may need an interbasin transfer certificate as water demand grows. Their current water supply system withdraws water from the Cape Fear River and distributes finished water to customers in the Cape Fear and Deep River Basins, discharging wastewater to the Deep River where it flows past the point of withdrawal on the Cape Fear River. However, water used in the Deep River Basin and not collected and treated for discharge back to the Deep River constitutes consumptive use in the Deep River Basin. Under the current rules governing interbasin transfers, a transfer certificate will be needed before consumptive use exceeds 2 mgd. According to Sanford's application, consumptive use in the Deep River Basin in 2000 was 1.55 mgd. The application did not provide enough information to assess when the 2 mgd threshold is likely to be exceeded.

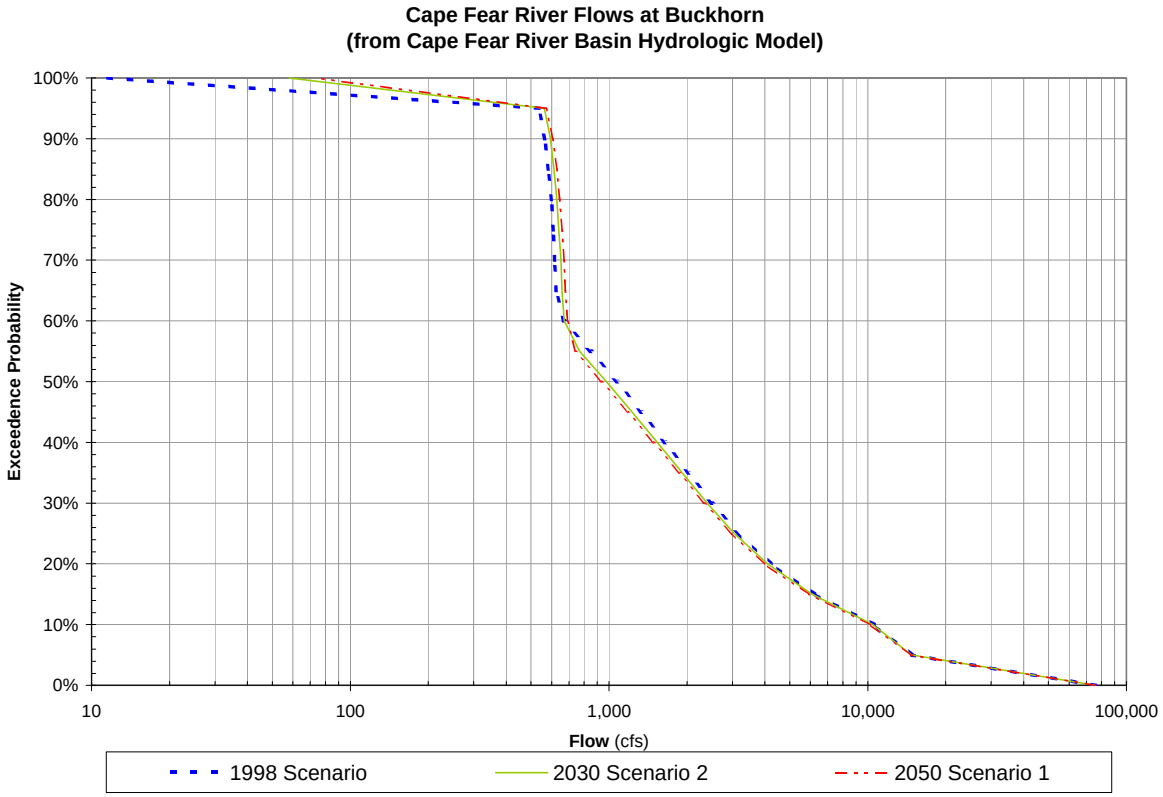
City of Sanford Application Data

City of Sanford	Round 3 Jordan Lake Allocation Application Data										
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Year-round Service Population	**27,000**	**34,800**	**40,900**	**48,000**	**56,600**	**66,600**	**76,000**	**83,700**	**92,100**	**101,400**	**111,600**
Percent of Estimated County Population	55%	66%	72%	80%	88%	98%	106%	111%	116%	122%	129%
Residential Use (mgd)	1.8	2.4	2.8	3.3	3.9	4.6	5.3	5.8	6.4	7.0	7.7
Residential Use (gpcd)	65	69	69	69	69	69	69	69	69	69	69
Commercial Use (mgd)	2.5	3.1	3.7	4.6	5.6	6.8	8.2	10.0	12.2	14.9	18.2
Commercial Use (gpcd)	93	88	90	95	98	101	108	120	133	147	163
Industrial Use (mgd) (included in Commercial)											
Industrial Use (gpcd)											
Institutional Use (mgd)	0.5	0.6	0.7	0.8	1.0	1.1	1.3	1.6	1.8	2.2	2.5
Institutional Use (gpcd)	19	17	17	17	17	17	17	19	20	21	23
System Processes (mgd)	0.9	1.2	1.4	1.7	2.1	2.5	2.8	3.3	3.9	4.6	5.4
System Processes (gpcd)	34	34	35	36	36	37	37	39	42	45	48
Unaccounted-for Water (mgd)	0.6	0.7	0.8	0.9	1.1	1.3	1.5	1.8	2.1	2.4	2.8
Unacct.-for Water (gpcd)	23	20	20	20	20	20	20	21	23	24	25
Total Service Area Demand (mgd)	**6.3**	**7.9**	**9.4**	**11.3**	**13.6**	**16.2**	**19.1**	**22.4**	**26.4**	**31.1**	**36.6**
Total Demand (gpcd)	233	228	231	236	240	244	252	268	287	306	328

mgd - million gallons per day

gpcd - gallons per capita day (gallons per person per day) based on service population and demand shown above


Sanford Water Use
(based on JL3 Application)
Million Gallons per Day
0
5
10
15
20
25
30
35
40
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
Unaccounted-for
System Processes
Institutional
Comm. / Indust.
Residential


Cape Fear River Flows at Buckhorn
(from Cape Fear River Basin Hydrologic Model)
Exceedence Probability
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
10
100
1,000
10,000
100,000
Flow (cfs)
1998 Scenario
2030 Scenario 2
2050 Scenario 1

Town of Holly Springs

The Town of Holly Springs currently purchases water from the City of Raleigh and from Harnett County to meet their water needs. Raleigh will not be able to supply Holly Springs with enough water to accommodate their projected needs. Holly Springs holds a 2 mgd allocation from Jordan Lake. To use their allocation, they intend to build a water treatment plant somewhere on the Cape Fear River below Jordan Lake or to purchase capacity in Harnett County's facility on the River in Lillington. Either of these options would put their intake in the reach of river with flows augmented by releases from Jordan Lake.

DWR modeled Holly Springs' future water supply withdrawals by assigning their intake to the Cape Fear River at the same location as the Harnett County intake. Lacking an in-stream flow study for that location, we estimated the available supply by using the general planning guideline of 20% of the 7Q10 flow of 530 cfs, as reported by USGS. Based on this figure, the amount of water that would likely be available at that location for water supply is 68.5 mgd. We divided the 68.5 mgd between Holly Springs and Harnett County for the model scenarios with 34.25 mgd assigned to each. With both intakes in close proximity, we modeled the withdrawals so that the cumulative withdrawal for both systems does not exceed the available supply. We chose to split the amount evenly for modeling purposes.

DWR determined that Holly Springs does not need an allocation from Jordan Lake and recommends that the 2 mgd allocation they currently hold be reassigned to the unallocated water supply pool. Based on Holly Springs' projected water demand, we estimated their 2050 water withdrawal from the Cape Fear River at 15.3 mgd. Model scenario results indicate that Holly Springs will be able to withdrawal this amount with no change in reliability by 2030 or 2050, compared with 1998. The total projected increase in withdrawals upstream of Holly Springs is 88.6 mgd by 2030 (an increase of 79 percent compared with 1998 withdrawals) and 154.9 mgd by 2050 (an increase of 139 percent compared with 1998 withdrawals). Despite these large projected increases in upstream withdrawals, the model scenarios indicate that a 12.2 mgd withdrawal by 2030 and a 15.3 mgd withdrawal by 2050 result in no decrease in the reliability of their water supply by 2030 or by 2050, compared with 1998.

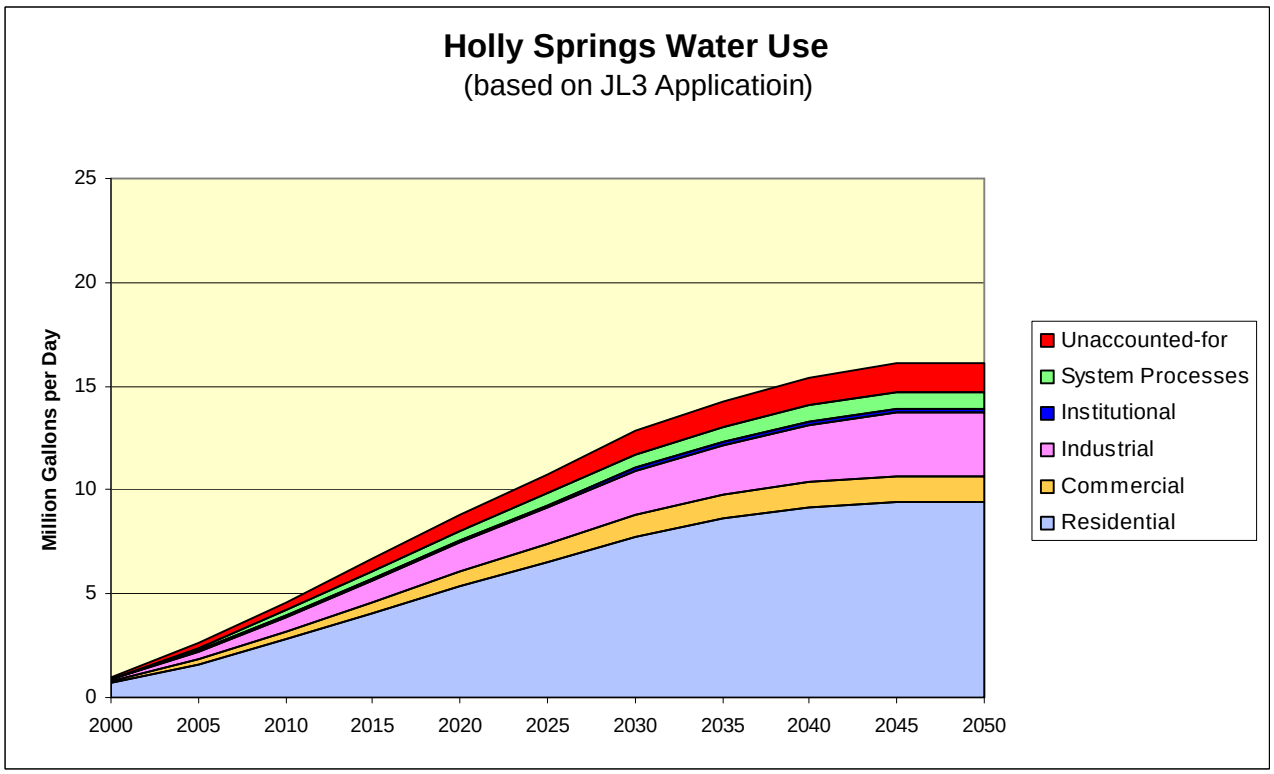
Holly Springs does not have an interbasin transfer related to using water from Jordan Lake with their current 2 mgd allocation or recommended allocation. However, as water demands grow consumptive use in the Neuse Basin will increase. If development progresses as described in their application, interbasin transfer will become an issue between 2025 and 2030 whether the water comes from Jordan Lake or the Cape Fear River. Population and water use projections for Holly Springs are summarized in the table and graph below.

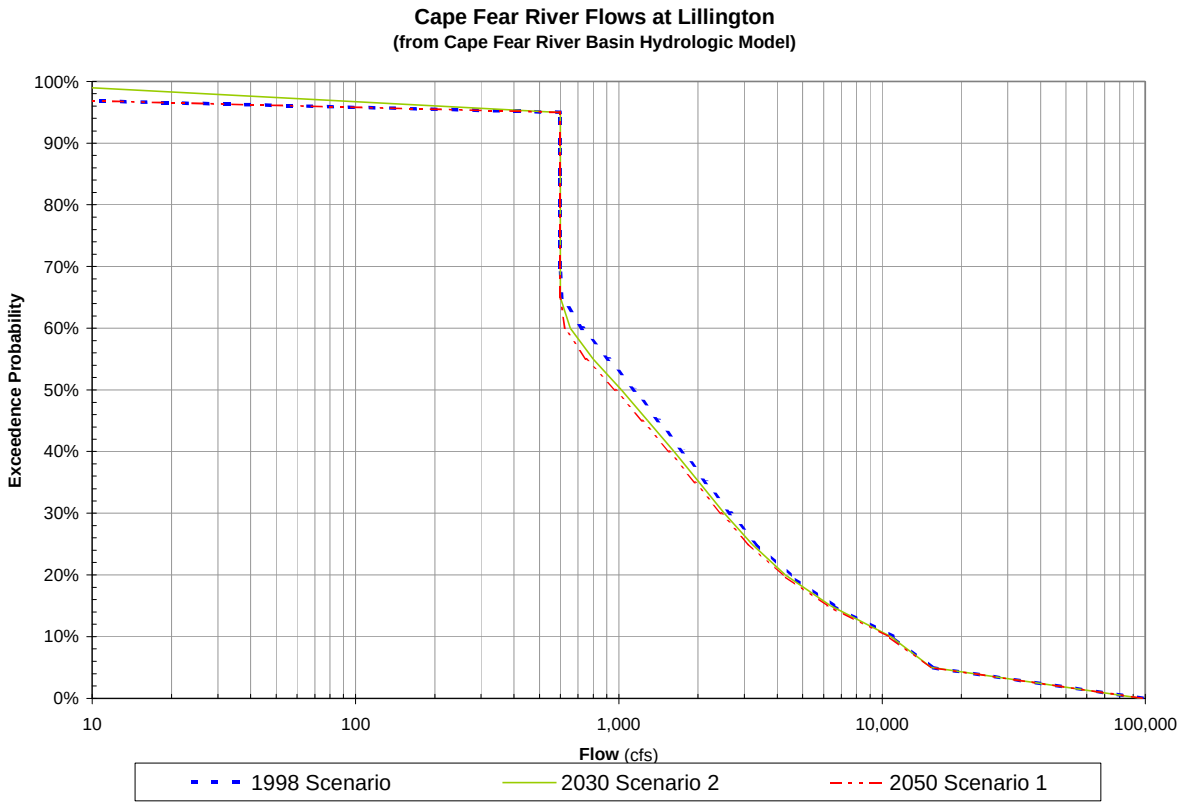
Town of Holly Springs Application Data

Town of Holly Springs	Round 3 Jordan Lake Allocation Application Data										
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Year-round Service Population	**9,192**	**21,506**	**37,275**	**54,235**	**71,403**	**87,211**	**103,890**	**114,816**	**122,221**	**125,002**	**125,002**
Percent of Estimated County Population	1.5%	2.9%	4.4%	5.7%	6.7%	7.4%	8.0%	8.2%	8.1%	7.7%	7.2%
Residential Use (mgd)	0.7	1.6	2.8	4.1	5.4	6.5	7.8	8.6	9.2	9.4	9.4
Residential Use (gpcd)	75	75	75	75	75	75	75	75	75	75	75
Commercial Use (mgd)	0.1	0.2	0.4	0.5	0.7	0.9	1.0	1.2	1.2	1.3	1.3
Commercial Use (gpcd)	10	10	10	10	10	10	10	10	10	10	10
Industrial Use (mgd)	0.1	0.4	0.7	1.1	1.4	1.7	2.1	2.4	2.7	3.1	3.1
Industrial Use (gpcd)	7	18	20	20	19	20	20	21	22	24	24
Institutional Use (mgd)	0.01	0.03	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
Institutional Use (gpcd)	1	1	2	1	2	1	2	1	1	2	2
System Processes (mgd)	0.1	0.1	0.2	0.4	0.5	0.6	0.7	0.7	0.8	0.8	0.8
System Processes (gpcd)	5	7	6	6	6	6	6	6	7	7	7
Unaccounted-for Water (mgd)	0.1	0.2	0.4	0.6	0.8	0.9	1.1	1.2	1.3	1.4	1.4
Unacct.-for Water (gpcd)	10	11	11	11	11	11	11	11	11	11	11
Total Service Area Demand (mgd)	**1.0**	**2.6**	**4.6**	**6.7**	**8.8**	**10.8**	**12.8**	**14.3**	**15.4**	**16.1**	**16.1**
Total Demand (gpcd)	108	122	123	123	123	123	123	125	126	129	129

mgd - million gallons per day

gpcd - gallons per capita day (gallons per person per day) based on service population and demand shown above





Harnett County

The Harnett County water system withdraws water from the Cape Fear River in Lillington. The intake is located just upstream of the stream gage used as a guide for releases from the low-flow augmentation pool of Jordan Lake. In addition to county residents, Harnett County's application included demand projections for the Towns of Coats, Lillington, Angier and Linden as part of their service area demand. Harnett County also provides water to Holly Springs and Fuquay-Varina in Wake County, and to the community of Woodlake in Moore County.

The Harnett County water system's service area demands, as presented in their application, are summarized in the table and graph shown below. DWR modeled Harnett County's future water demands and evaluated the ability of the system to meet their withdrawal needs. Lacking an in-stream flow study for that location, we estimated the available supply by using the general planning guideline of 20% of the 7Q10 flow of 530 cfs, reported by USGS. Based on this figure, the amount of water that would likely be available at that location for water supply is 68.5 mgd. We divided the 68.5 mgd between Harnett County and Holly Springs for the model scenarios with 34.25 mgd assigned to each. With both intakes in close proximity, we modeled the withdrawals so that the cumulative withdrawal for both systems does not exceed the available supply. We chose to split the amount evenly for modeling purposes.

DWR determined that Harnett County does not need an allocation from Jordan Lake to meet anticipated water demands, and the projected withdrawals will not significantly affect flows

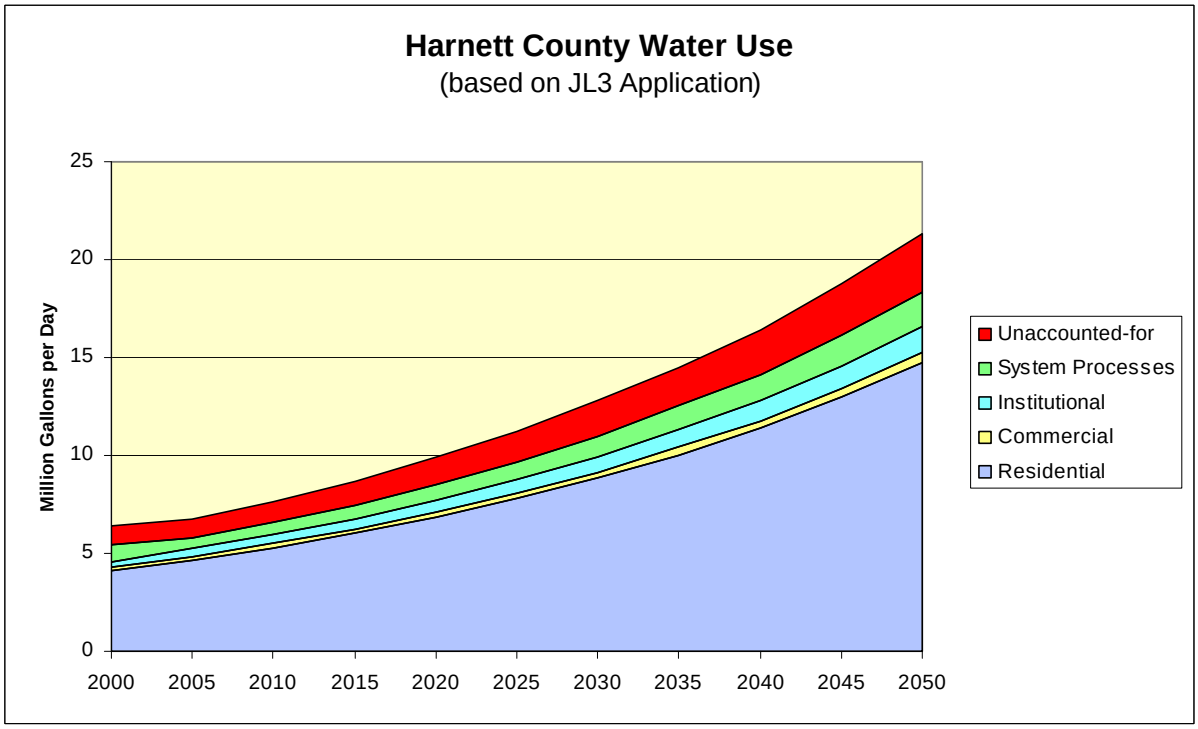
downstream. Based on Harnett County's projected water demands, we estimated their 2050 water withdrawal from the Cape Fear River at 28.9 mgd. Model scenario results indicate that Harnett County will be able to withdrawal this amount with no change in reliability by 2030 or 2050, compared with the reliability of their water source in1998. The total projected increase in withdrawals upstream of Harnett County is 88.6 mgd by 2030 (an increase of 79 percent compared with 1998 withdrawals) and 154.9 mgd by 2050 (an increase of 139 percent compared with 1998 withdrawals). Despite these large projected increases in upstream withdrawals, the model scenarios indicate that an 11.7 mgd increase in withdrawal by 2030 (an increase of 198 percent compared with their 1998 withdrawal) and a 23.0 mgd increase in withdrawal by 2050 (an increase of 391 percent compared with their 1998 withdrawal) result in no decrease in the reliability of their water supply by 2030 or by 2050, compared with 1998. Interbasin transfer is not an issue for this system based on the available information.

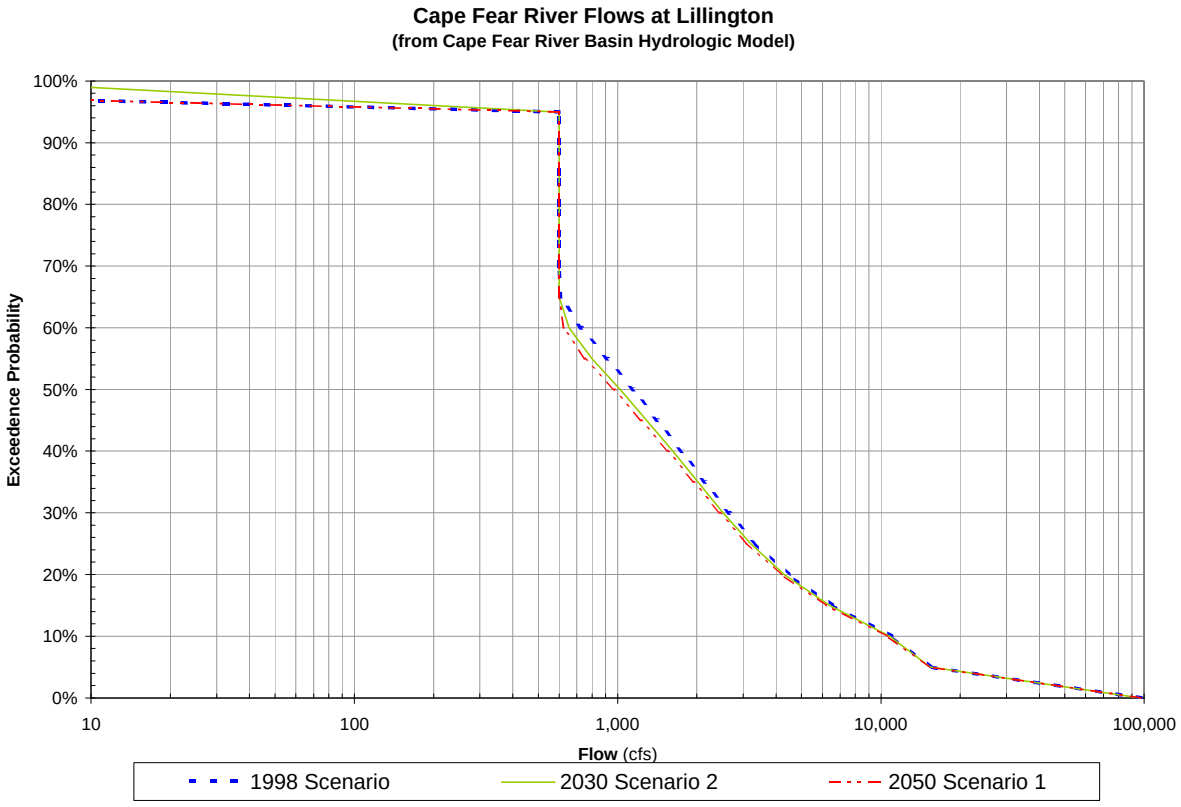
Harnett County Application Data

Harnett County Public Utilities	**Round 3 Jordan Lake Allocation Application Data**										
	2000	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Year-round Service Population	**66,097**	**75,112**	**85,356**	**96,997**	**110,226**	**125,259**	**142,342**	**161,755**	**183,816**	**208,885**	**237,374**
Percent of Estimated County Population	73%	73%	74%	76%	78%	82%	86%	91%	96%	103%	110%
Residential Use (mgd)	4.1	4.7	5.3	6.0	6.8	7.8	8.8	10.0	11.4	13.0	14.7
Residential Use (gpcd)	62	62	62	62	62	62	62	62	62	62	62
Commercial Use (mgd)	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.6
Commercial Use (gpcd)	3	2	2	2	2	2	2	2	2	2	2
Industrial Use (mgd) (included in Commercial)											
Industrial Use (gpcd)											
Institutional Use (mgd)	0.3	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.3
Institutional Use (gpcd)	4	5	5	5	5	5	5	5	5	5	5
System Processes (mgd)	0.9	0.6	0.6	0.7	0.8	0.9	1.1	1.2	1.4	1.6	1.8
System Processes (gpcd)	13	7	7	7	7	7	7	7	7	7	7
Unaccounted-for Water (mgd)	1.0	0.9	1.1	1.2	1.4	1.6	1.8	2.0	2.3	2.6	2.9
Unacct.-for Water (gpcd)	15	12	12	12	12	12	12	12	12	12	12
Total Service Area Demand (mgd)	**6.4**	**6.7**	**7.7**	**8.7**	**9.9**	**11.2**	**12.8**	**14.5**	**16.4**	**18.7**	**21.3**
Total Demand (gpcd)	98	90	90	90	90	90	90	90	89	90	90

mgd - million gallons per day

gpcd - gallons per capita day (gallons per person per day) based on service population and demand shown above


Harnett County Water Use
(based on JL3 Application)
Million Gallons per Day
25
20
15
10
5
0
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
Unaccounted-for
System Processes
Institutional
Commercial
Residential


Cape Fear River Flows at Lillington
(from Cape Fear River Basin Hydrologic Model)
Exceedence Probability
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
10
100
1,000
10,000
100,000
Flow (cfs)
1998 Scenario
2030 Scenario 2
2050 Scenario 1

City of Fayetteville

The Public Works Commission of the City of Fayetteville provides water to customers in Fayetteville and surrounding areas of Cumberland County, including the towns of Spring Lake and Hope Mills. PWC also supplies water to the Hoke County Regional Water System for customers in eastern Hoke County. According to their application, PWC expects to serve 90% of the county population by 2030. In 2000, PWC supplied 58% of the county population with an average daily water use of 26.6 mgd. PWC's major raw water supply is the Cape Fear River with an additional 5 mgd available from a series of impoundments on Little Cross Creek and Big Cross Creek.

Based on the recent USGS report, DWR staff used 625 cfs as the 7Q10 flow at Fayetteville. Lacking an in-stream flow study for that location, we estimated the available supply by using the general planning guideline of 20% of the 7Q10 flow of 625 cfs. Based on this figure, the amount of water that would likely be available at PWC's intake for water supply is 80.8 mgd. Combined with the 5 mgd supply from their other sources, PWC has an estimated available supply of 85.8 mgd. PWC projects needing 76.6 mgd to meet projected water demands in 2050. As noted above, the model scenarios indicate no significant reduction in the reliability of flows at Lillington and downstream. The projections provided in PWC's application are summarized in the table and graph below.

DWR determined that Fayetteville PWC does not need an allocation from Jordan Lake to meet anticipated water demands. Based on PWC's projected water demands, assuming that the 5 mgd available from the Glenville Lake system is used, their 2050 water withdrawal from the Cape Fear River would be 71 mgd. Model scenario results indicate that Fayetteville will be able to withdrawal this amount with no significant change in reliability in 2030 or 2050, compared with the reliability of the source to meet their demand in 1998. The total projected increase in withdrawals upstream of Fayetteville is 114.5 mgd by 2030 (an increase of 93 percent compared with 1998 withdrawals) and 197.0 mgd by 2050 (an increase of 161 percent compared with 1998 withdrawals). Despite these large projected increases in upstream withdrawals, the model scenarios indicate that a 38.6 mgd increase in withdrawal by 2030 (an increase of 213 percent compared with their 1998 withdrawal) and a 57.1 mgd increase in their withdrawal by 2050 (an increase of 314 percent compared with their 1998 withdrawal) result in no decrease in the reliability of their water supply by 2030 and only a 0.2 percent decrease in reliability by 2050, compared with 1998. This minute decrease in reliability is a result of the large increases in projected demands for the water supply systems withdrawing water upstream of Fayetteville, as well as the large projected increase in PWC's withdrawal. Note that these modeled impacts on reliability do not incorporate any drought management for Jordan Lake or any water supply systems in the Basin. Drought management measures will improve the reliability of water supplies.

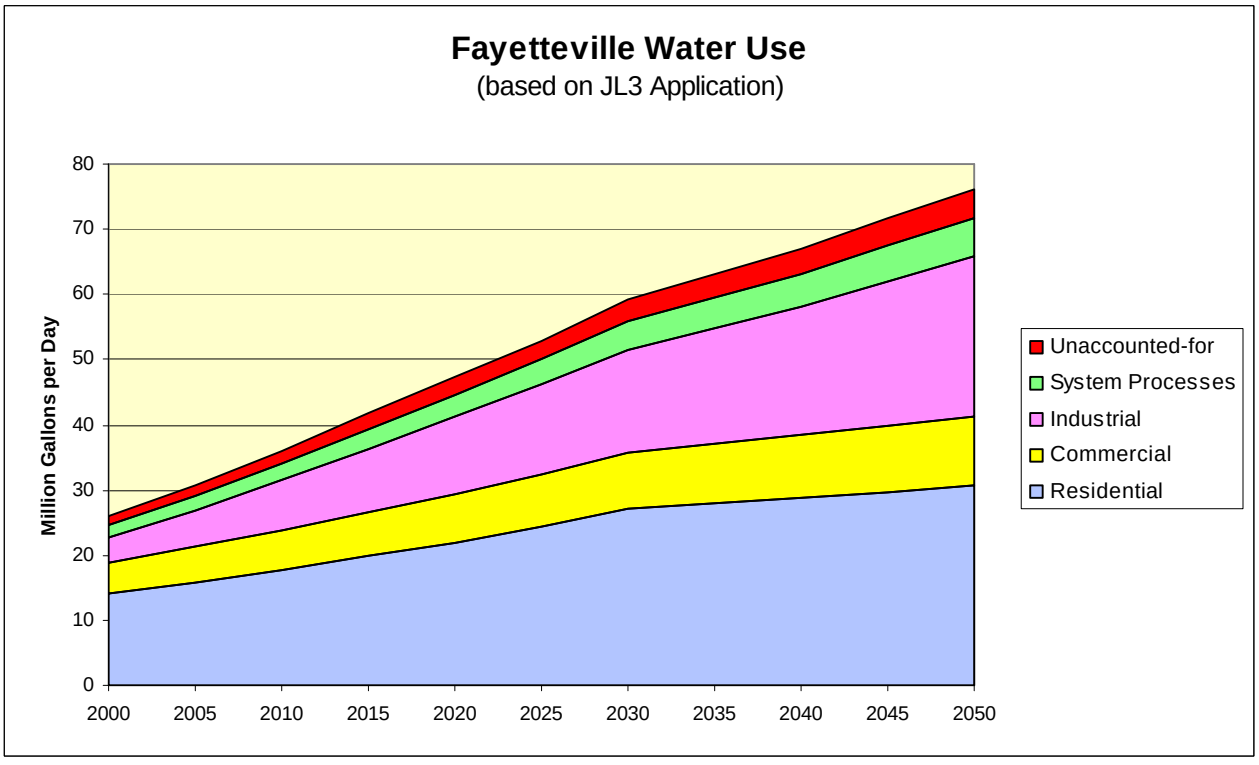
Interbasin transfer is not currently an issue for this system. However, their application indicates an intention to serve 90% of Cumberland County residents in the future. Since the eastern portions of the county are in the South River Basin, an interbasin transfer certificate will be needed before consumptive use of water in the South River Basin is allowed to exceed 2 mgd.

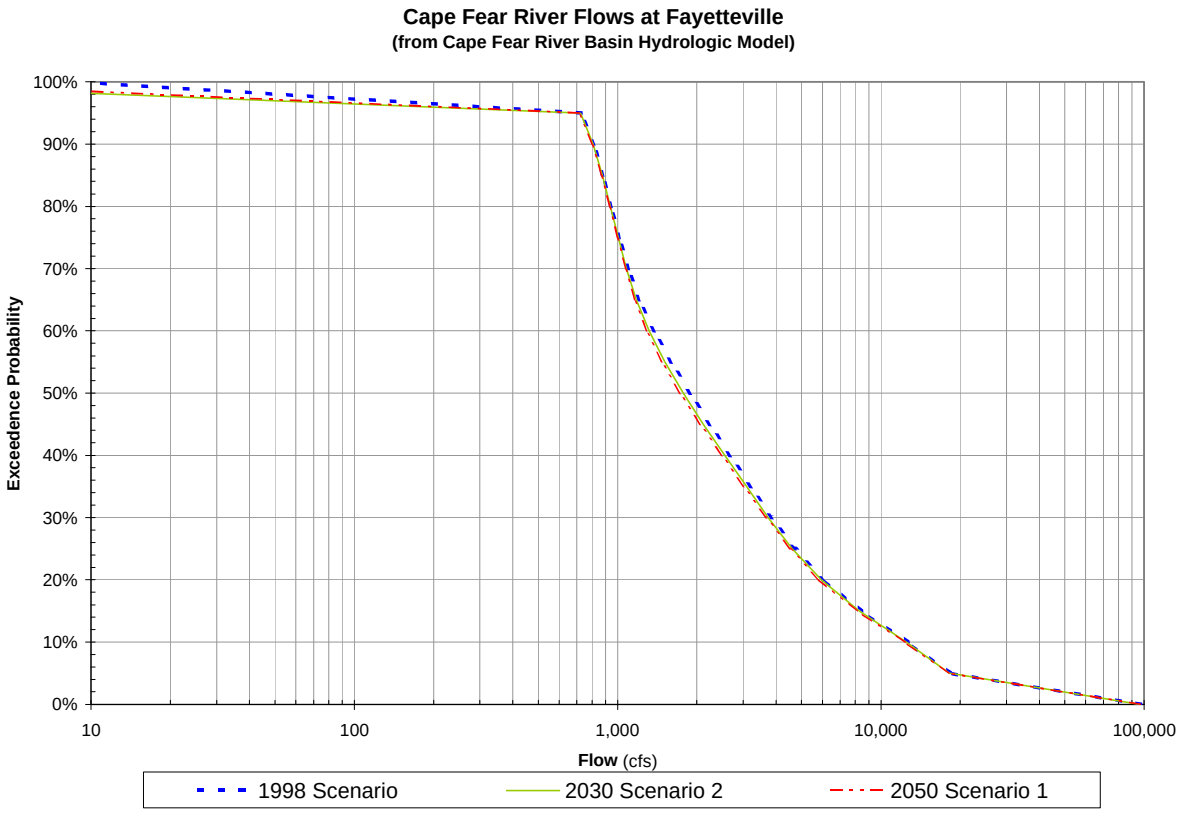
City of Fayetteville Application Data

City of Fayetteville	Round 3 Jordan Lake Allocation Application Data										
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Year-round Service Population	**178,200**	**210,370**	**243,160**	**278,310**	**315,840**	**355,740**	**402,480**	**423,810**	**445,140**	**466,470**	**487,800**
Percent of Estimated County Population	59%	66%	73%	79%	86%	93%	101%	103%	104%	105%	106%
Residential Use (mgd)	14.0	15.9	17.8	19.8	22.0	24.3	27.0	27.9	28.8	29.7	30.6
Residential Use (gpcd)	79	76	73	71	70	68	67	66	65	64	63
Commercial Use (mgd)	4.7	5.4	6.0	6.7	7.3	8.0	8.8	9.2	9.7	10.2	10.6
Commercial Use (gpcd)	26	26	25	24	23	22	22	22	22	22	22
Industrial Use (mgd)	3.9	5.5	7.7	9.9	11.9	13.8	15.8	17.6	19.5	22.1	24.6
Industrial Use (gpcd)	22	26	32	36	38	39	39	42	44	47	50
Institutional Use (mgd)											
Institutional Use (gpcd)											
System Processes (mgd)	1.9	2.2	2.6	3.0	3.5	3.9	4.4	4.7	5.1	5.5	5.8
System Processes (gpcd)	11	10	11	11	11	11	11	11	11	12	12
Unaccounted-for Water (mgd)	1.4	1.7	2.0	2.3	2.6	3.0	3.3	3.6	3.8	4.1	4.4
Unacct.-for Water (gpcd)	8	8	8	8	8	8	8	8	9	9	9
Total Service Area Demand (mgd)	**25.9**	**30.7**	**36.1**	**41.7**	**47.3**	**53.0**	**59.3**	**63.0**	**66.9**	**71.6**	**76.0**
Total Demand (gpcd)	145	146	148	150	150	149	147	149	150	153	156

mgd - million gallons per day

gpcd - gallons per capita day (gallons per person per day) based on service population and demand shown above





APPLICANTS USING WATER SUPPLIES ABOVE JORDAN DAM

Orange County

Orange County currently holds a 1 mgd allocation from Jordan Lake and submitted an application to retain it. Orange County does not currently operate a water distribution system. The County's role is as a provider of raw water for water systems to distribute to residents of the county. In 1972, the County constructed Lake Orange as a water supply source. Orange County manages the lake to maintain minimum flows in the Eno River and to provide water for Hillsborough. The Orange-Alamance Water System, Inc. and Piedmont Minerals are other significant water supply users on the Eno River. Hillsborough has recently developed an additional water supply source on the West Fork of the Eno River.

The I-85/I-40 corridor west of Hillsborough has been designated by a county-wide utility agreement as an Orange County "interest" area. Much of this area is currently served by the Orange-Alamance Water System, a private non-profit community water system. This system would be the logical provider of water for the rest of this area. However, the Orange-Alamance system lacks a dependable long-term supply of water. In 2000, Orange-Alamance provided an average of 1.1 mgd of water to 11,500 people. The 20-year safe yield of their surface water

supply is listed in their Local Water Supply Plan as 0.37 mgd, which they supplement with ground water from two wells having a combined 12-hour yield of 0.1 million gallons. The system relies on short-term "emergency" purchases from the Hillsborough and Graham-Mebane water systems to meet existing customer demand.

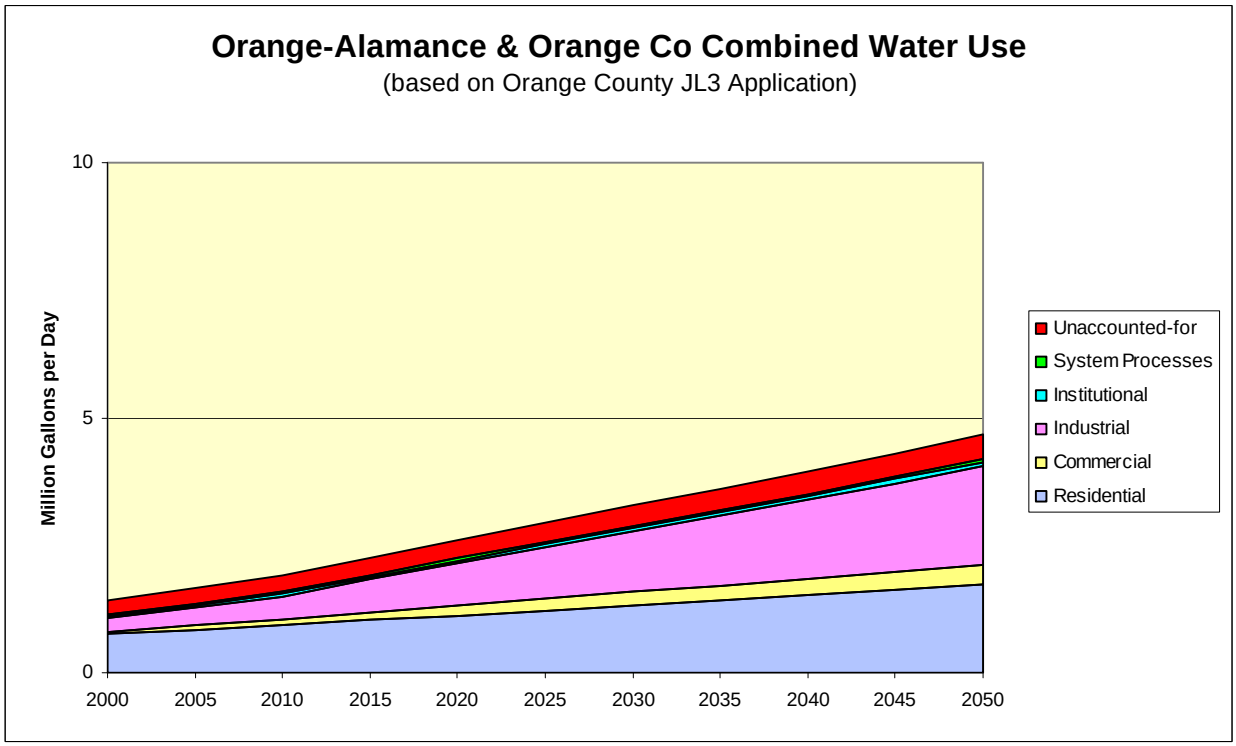
Orange County's goal in maintaining their allocation is to provide a reliable long-term source of water to county residents by making water available to existing water systems, most likely to Orange-Alamance. Use of water from Jordan Lake will require inter-local agreements for transfer and distribution of water. Orange County's application is based on demand projections developed by County staff for the Orange-Alamance Water System and surrounding county lands. The table and graph below summarize these projections. Orange County requested that they be allowed to keep their current 1 mgd allocation from Jordan Lake. DWR recommends that Orange County's 1.0 mgd allocation be continued. DWR's analysis suggests that if they can reach agreement with the Orange-Alamance Water System and develop the necessary inter-local agreements to move water from the lake, they will likely need more water from Jordan Lake in the future. Combining Orange-Alamance's existing available supply with the 1 mgd allocation will meet their needs until about 2010.

Orange-Alamance Water System Data prepared and submitted by Orange County

Orange-Alamance Water System prepared and submitted by Orange County											
	2000	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Year-round Service Population	13800	15550	17300	19050	20800	22550	24300	26050	27800	29550	31300
Percent of Estimated County Population	12%	12%	12%	12%	12%	13%	13%	13%	13%	13%	13%
Residential Use (mgd)	0.6	0.7	0.8	0.9	1.0	1.0	1.1	1.2	1.3	1.4	1.4
Residential Use (gpcd)	46	46	46	46	46	46	46	46	46	46	46
Commercial Use (mgd)	0.05	0.08	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
Commercial Use (gpcd)	4	5	6	8	10	10	10	10	11	11	11
Industrial Use (mgd) (included in Commercial)	0.2	0.3	0.4	0.6	0.8	0.9	1.1	1.3	1.5	1.7	1.8
Industrial Use (gpcd)	15	19	23	30	37	42	46	50	53	56	59
Institutional Use (mgd)	0.03	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.06	0.06
Institutional Use (gpcd)	2	2	2	2	2	2	2	2	2	2	2
System Processes (mgd)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
System Processes (gpcd)	2.2	1.9	1.7	1.6	1.4	1.3	1.2	1.2	1.1	1.0	1.0
Unaccounted-for Water (mgd)	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Unacct.-for Water (gpcd)	15	14	13	13	12	12	11	11	10	10	10
Total Service Area Demand (mgd)	**1.2**	**1.4**	**1.6**	**1.9**	**2.2**	**2.5**	**2.8**	**3.1**	**3.4**	**3.7**	**4.0**
Total Demand (gpcd)	85	88	92	100	107	112	116	120	123	126	128

mgd - million gallons per day

gpcd - gallons per capita day (gallons per person per day) based on service population and demand shown above



Orange Water and Sewer Authority (OWASA)

OWASA provides water to residents of Carrboro, Chapel Hill and their defined Urban Services Area in southeastern Orange County. In 2000, the system supplied on average 9.3 mgd of water to 71,900 people. The size of their planned service area is not expected to increase within the 50 year planning horizon covered by Round Three allocation applications. With limited land available, OWASA expects to reach buildout by the end of the planning horizon. For this application, they based their demand forecasts on linear projections of the "moderate growth rates experienced during the past 20 to 25 years." OWASA's existing University Lake and Cane Creek Reservoir system can provide the system with 14.3 mgd of water. They have plans to develop an offstream storage facility at the site of an existing stone quarry which will be online by 2035 and provide an estimated 5.1 mgd of additional supply.

OWASA currently holds a 10 mgd allocation from Jordan Lake and owns a site in Chatham County on the western shore of the lake that has been identified as a potential location for an intake facility. According to their application, OWASA staff have joined staff members of Durham and Chatham County in discussions about "potential joint ventures in withdrawal, transmission, and treatment facilities including the possible creation of a Jordan Lake water development authority." Discussions have been preliminary and "it is premature to speculate on their eventual outcomes."

OWASA would like to keep 5 mgd of their current allocation, releasing the other 5 mgd to be reassigned to the unallocated water supply pool. Because of arrangements with current quarry operators, the storage capacity of the quarry will not be available until 2030 and will

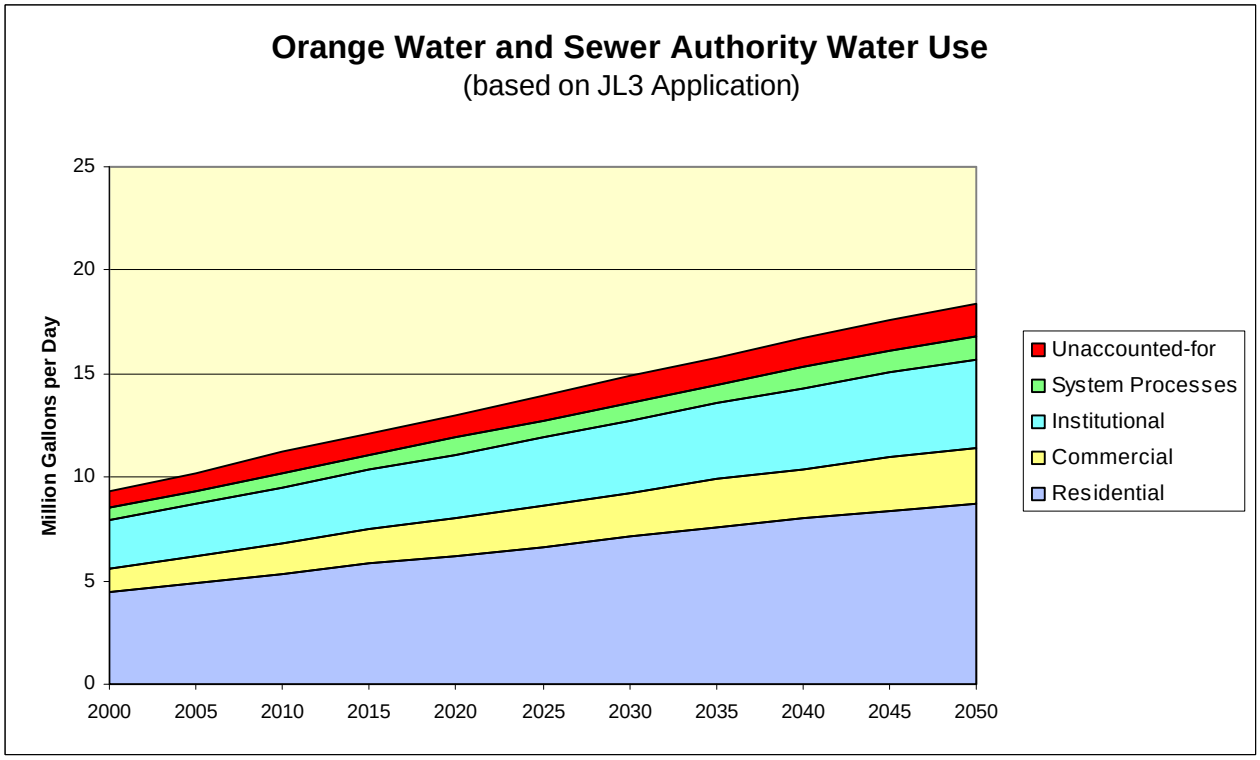
require several years for development of the water supply project. OWASA developed demand projections prior to Round Three of the Jordan Lake allocation process for their Master Plan and used these projections in their Round Three application. The application data show that OWASA is likely to begin to use their Jordan Lake allocation around 2025, possibly sooner. OWASA provided detailed demand projections for their relevant use sectors, as requested. The table and graph below summarize their population and demand projections. DWR recommends that OWASA be allowed to retain 5 mgd of their current allocation, and that the remaining 5 mgd be reassigned to the unallocated water supply pool. OWASA's use of Jordan Lake water does not constitute a withdrawal of water from the watershed of the Lake or an interbasin transfer. OWASA's entire service area and their wastewater discharges are located in the Haw River Basin, upstream of Jordan Lake.

Orange Water and Sewer Authority Application Data

Orange Water and Sewer Authority	**Round 3 Jordan Lake Allocation Application Data**										
	2000	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Year-round Service Population	71600	78100	84400	90800	97200	103600	110000	116500	122900	129300	135700
Percent of Estimated County Population	61%	60%	59%	58%	58%	58%	57%	57%	57%	57%	56%
Residential Use (mgd)	4.4	4.9	5.3	5.8	6.2	6.6	7.1	7.6	8	8.4	8.7
Residential Use (gpcd)	61	63	63	64	64	64	65	65	65	65	64
Commercial Use (mgd)	1.2	1.3	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7
Commercial Use (gpcd)	17	17	18	19	19	19	19	20	20	20	20
Industrial Use (mgd) (included in Commercial)											
Industrial Use (gpcd)											
Institutional Use (mgd) (UNC/UNC hospitals)	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3
Institutional Use (gpcd)	32	32	32	32	32	32	32	32	32	32	32
System Processes (mgd)	0.6	0.6	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.0	1.1
System Processes (gpcd)	8	8	8	8	8	8	8	8	8	8	8
Unaccounted-for Water (mgd)	0.8	0.9	1.0	1.0	1.1	1.2	1.3	1.3	1.4	1.5	1.6
Unacct.-for Water (gpcd)	11	12	12	11	11	12	12	11	11	12	12
Total Service Area Demand (mgd)	**9.3**	**10.2**	**11.2**	**12.1**	**13.0**	**13.9**	**14.9**	**15.8**	**16.7**	**17.6**	**18.4**
Total Demand (gpcd)	130	131	133	133	134	134	135	136	136	136	136

mgd - million gallons per day

gpcd - gallons per capita day (gallons per person per day) based on service population and demand shown above



Chatham County

Chatham County's application for water represents the demand projections for a countywide water system that will evolve from the interconnection of the three existing, county-operated water systems and expansion into currently unserved areas of the county. In 2000, the three systems served 11,351 people using on average 1.25 mgd of water from all sources. The county currently holds a 6 mgd allocation from Jordan Lake from which it supplies water through a Chatham County Water Treatment Plant to the North Chatham water system, serving customers in the area northeast of Pittsboro. The North Chatham system also receives water from Pittsboro and has connections with OWASA and Durham. The East Chatham water system supplies water purchased from Sanford to customers in the southeastern townships below Jordan Lake. The Southwest Chatham water system provides water purchased from Siler City and the Goldston-Gulf Sanitary District to residents in the southwestern quadrant of the county. The county has developed a long-range plan that maps out a countywide water system.

Chatham County requested a 4.5 mgd increase in their Jordan Lake allocation for a total allocation of 10.5 mgd. Chatham County based their demand projections on estimates of population growth in the county, increases in the percent of that population to be served, and population growth for Siler City and Pittsboro. The county anticipates supplying water to Pittsboro and Siler City in the future, but assumes that both communities will be able to proceed with planned expansion of their current sources. With this assumption, Pittsboro and Siler City will not need water from the county until beyond 2030, the end date for which we are making allocations during Round Three. Chatham County presented their population and demand projections for the county as a whole. Therefore, DWR's analysis focused on evaluating the

cumulative demands and supplies available to the county as a whole. The tables and graphs that follow this discussion summarize the county population and demand projections.

The population projections in the application were not inconsistent with DWR's independent estimates of county population through 2050. Chatham County developed demand projections for relevant use sectors as requested in the application material. However, they projected residential water demand using a rapidly increasing water use rate well beyond the normal use rate for other water systems in the region. Among the other applicants, residential water use rates ranged from 46 to 79 gallons per person per day (gpcd), compared with the 200 gpcd residential use rate Chatham County used for 2030. DWR adjusted Chatham County's projected residential water use rate to 85 gpcd and recalculated total projected demands using population, commercial and industrial projections from the application, and the same percentages of "system process water" and "unaccounted-for water" as used for each time period in the application. Note that a residential water use rate of 85 gpcd represents a significant increase over Chatham County's 2000 residential water use rate of 59 gpcd. Based on the experience of other water systems in the region, the expected increase in suburban development will likely raise the residential use rate. Both sets of projections, those from the application and those developed by DWR, are presented in the tables and graphs that follow.

Based on the adjusted projections, DWR recommends no increase in Chatham County's allocation in Round Three. From a countywide perspective, their existing supplies should be adequate to meet county demands through 2030. With Jordan Lake water currently only going to the North Chatham system, use of Lake water does not constitute a withdrawal from the watershed or an interbasin transfer. However, Chatham County lies within three river basins, the Haw, Deep and Cape Fear. If a countywide system develops using water from Jordan Lake, an interbasin transfer certificate will be needed before consumptive use in the Deep and Cape Fear River Basins is allowed to exceed 2 mgd.

Chatham County Application Data

Chatham County	Round 3 Jordan Lake Allocation Application Data										
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Year-round Service Population	11351	15824	20542	23412	26796	30805	35579	41288	48146	56420	66441
Percent of Estimated County Population	23%	29%	34%	36%	39%	41%	45%	49%	54%	60%	67%
Residential Use (mgd)	0.7	1.6	4.1	4.7	5.3	6.1	7.1	8.3	9.7	11.4	13.5
Residential Use (gpcd)	59	104	199	199	199	199	200	201	201	202	203
Commercial Use (mgd)	0.2	0.4	0.7	0.8	0.9	1.1	1.2	1.4	1.6	1.8	2.0
Commercial Use (gpcd)	13	22	35	35	35	34	34	33	33	32	31
Industrial Use (mgd)	0.2	0.3	0.4	0.4	0.6	0.7	0.9	1.1	1.3	1.7	2.1
Industrial Use (gpcd)	14	18	17	19	21	22	24	26	28	30	31
Institutional Use (mgd)											
Institutional Use (gpcd)											
System Processes (mgd)	0.01	0.4	0.8	1.0	1.1	1.3	1.5	1.7	2.0	2.4	2.8
System Processes (gpcd)	1	26	41	41	41	41	41	42	42	42	42
Unaccounted-for Water (mgd)	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
Unacct.-for Water (gpcd)	25	12	10	9	8	7	7	6	6	5	4
Total Service Area Demand (mgd)	**1.3**	**2.9**	**6.2**	**7.1**	**8.1**	**9.4**	**10.9**	**12.7**	**14.9**	**17.5**	**20.7**
Total Demand (gpcd)	111	181	301	302	303	304	306	308	309	311	312

mgd - million gallons per day

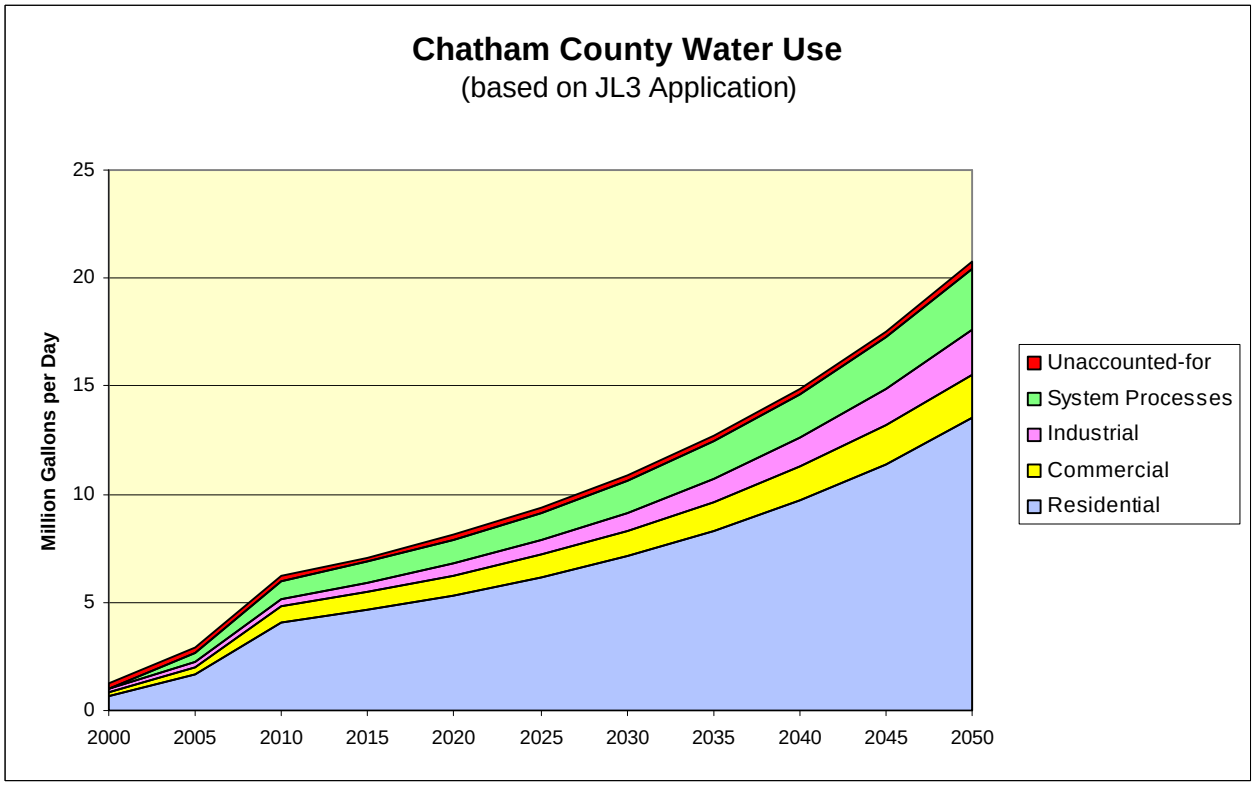
gpcd - gallons per capita day (gallons per person per day) based on service population and demand shown above

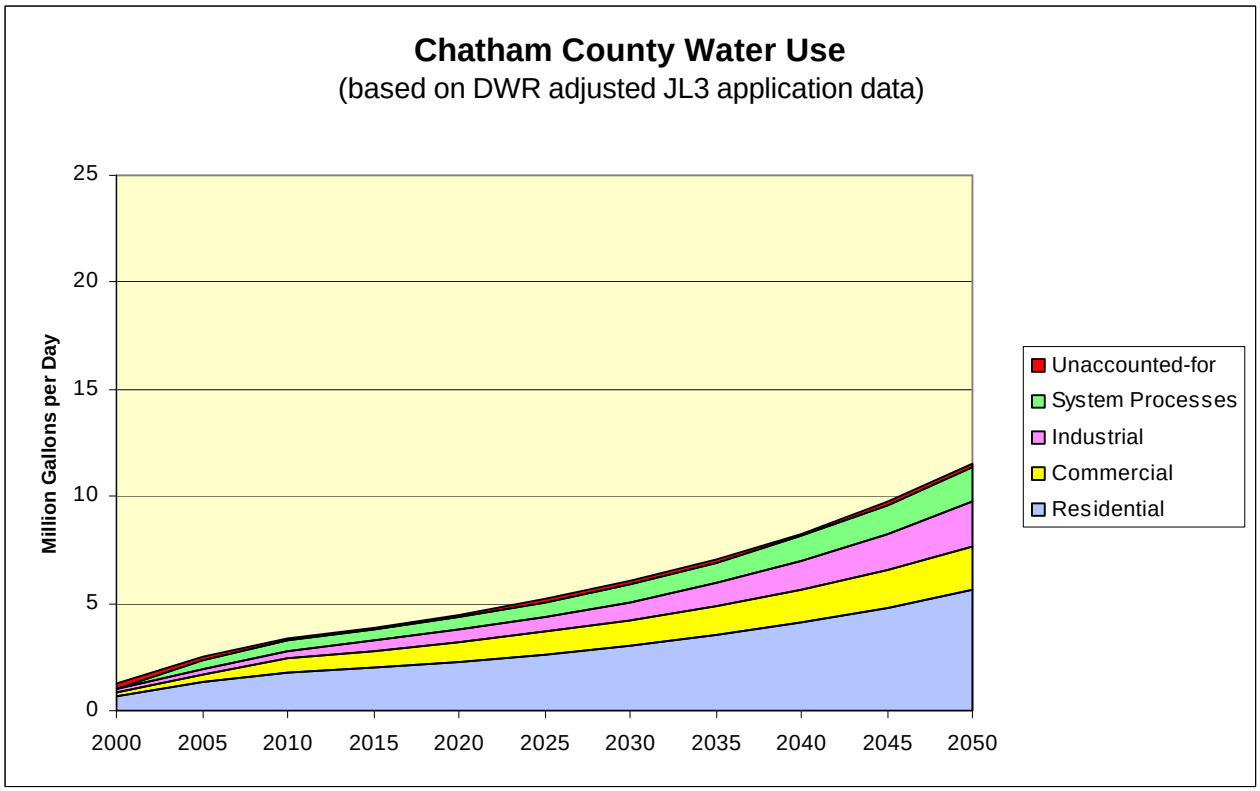
Chatham County Data Adjusted by the Division of Water Resources

Chatham County JL3 Application Data	(Adjusted by DWR)										
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Year-round Service Population	11351	15824	20542	23412	26796	30805	35579	41288	48146	56420	66441
Percent of Estimated County Population	23%	29%	34%	36%	39%	41%	45%	49%	54%	60%	67%
Residential Use (mgd)	0.7	1.3	1.7	2.0	2.3	2.6	3.0	3.5	4.1	4.8	5.6
Residential Use (gpcd)	59	85	85	85	85	85	85	85	85	85	85
Commercial Use (mgd)	0.2	0.4	0.7	0.8	0.9	1.1	1.2	1.4	1.6	1.8	2.0
Commercial Use (gpcd)	13	22	35	35	35	34	34	33	33	32	31
Industrial Use (mgd)	0.2	0.3	0.4	0.4	0.6	0.7	0.9	1.1	1.3	1.7	2.1
Industrial Use (gpcd)	14	18	17	19	21	22	24	26	28	30	31
Institutional Use (mgd)											
Institutional Use (gpcd)											
System Processes (mgd)	0.01	0.4	0.5	0.5	0.6	0.7	0.8	1.0	1.1	1.3	1.6
System Processes (gpcd)	1	23	22	23	23	23	23	23	23	23	23
Unaccounted-for Water (mgd)	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
Unacct.-for Water (gpcd)	25	10	5	5	5	4	4	3	3	3	2
Total Service Area Demand (mgd)	**1.3**	**2.5**	**3.4**	**3.9**	**4.5**	**5.2**	**6.0**	**7.1**	**8.3**	**9.7**	**11.5**
Total Demand (gpcd)	111	158	165	166	167	168	170	171	172	172	173

mgd - million gallons per day

gpcd - gallons per capita day (gallons per person per day) based on service population and demand shown above


Chatham County Water Use
(based on JL3 Application)
Million Gallons per Day
0
5
10
15
20
25
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
Unaccounted-for
System Processes
Industrial
Commercial
Residential


Chatham County Water Use
(based on DWR adjusted JL3 application data)
Million Gallons per Day
0
5
10
15
20
25
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
Unaccounted-for
System Processes
Industrial
Commercial
Residential

City of Durham

The City of Durham provides water to residents of the city and to portions of the county surrounding the city, with the limits of an Urban Growth Area designated by agreement between the City Council and the County Commissioners. Durham developed growth projections and water demand projections independent of the Jordan Lake Allocation process as part of the City of Durham Water and Sewer Strategic Plan. Durham's current policy limits water and sewer expansions to the boundaries of the Urban Growth Area, except for schools, industries, and to remedy public health concerns related to failing wells or septic systems. In 2000, the system's service area demand was 31 mgd on average and provided water to an estimated 203,341 people.

Durham pumps raw water from the Flat River and Little River, both in the Neuse River Basin. The current available supply is 37 mgd. Wastewater is treated by three plants, with about 40 percent returned to the Neuse River Basin and the remainder discharged to the Haw River Basin above Jordan Lake. In 2000, Durham discharged, on average, 13.4 mgd of water to New Hope River and Jordan Lake.

Durham's application assumes a 6 percent reduction in overall per capita water demand by 2005 based on implementing a water reuse program. In addition, Durham's demand projections incorporate significant reductions in the percentage amounts of system process water and unaccounted-for water. Durham's projected average water demand will exceed their available supply by 2010. By 2030, the planning period used for Round Three Jordan Lake allocations, Durham's projected service area demand will reach 46.3 mgd, 9.3 mgd over their available supply. Durham's population and demand projections are summarized in the table and graph that follow this discussion.

Durham's primary alternative to the use of Jordan Lake to expand their available water supply is to raise the dam at Lake Michie on the Flat River by 24 feet, flooding an additional 440 acres. This project would take at least until 2015 to be operational. To provide additional supply prior to completion of this project the city would consider using a former quarry to increase off-stream storage by diverting additional water from the Flat River, Little River and Eno River. This alternative would have significantly greater environmental impacts than a Jordan Lake allocation.

Durham representatives have been meeting with representatives of OWASA and Chatham County, both of which currently hold allocations, for preliminary discussions of a joint effort to develop a western water intake and pumping station on Jordan Lake. The Cary-Apex intake on the eastern shore currently provides water for the Cary-Apex system, Morrisville, RTP South and Chatham County. Growth in these systems will use all the potential capacity of this intake. To fully utilize the water supply storage of Jordan Lake, another intake will be needed.

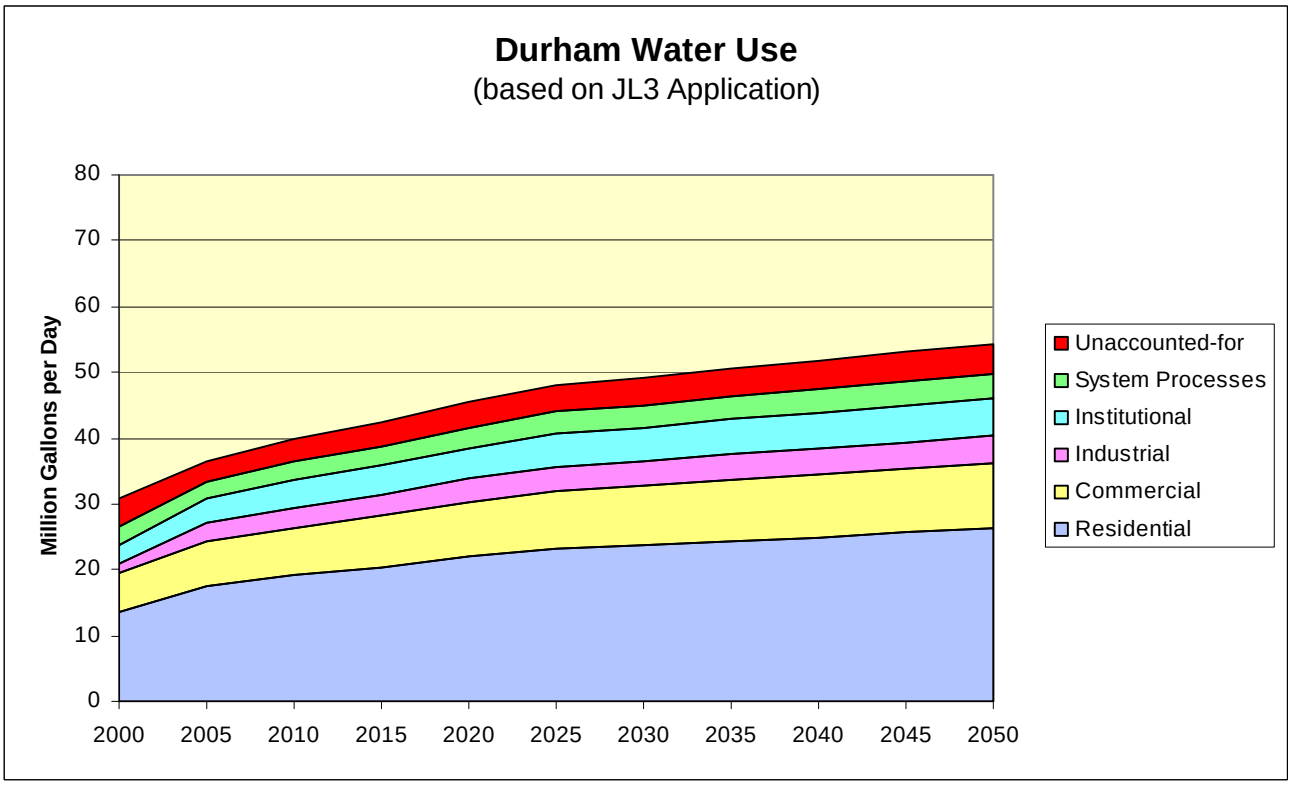
The request is based on 2050 needs plus a 20% margin of safety. DWR reduced its recommendation for all applicants to 2030 needs, without a margin of safety. We assume that additional allocations will be considered as needed before 2030. DWR recommends a Round Three allocation of 10 mgd to the City of Durham. Durham's application indicates that wastewater generated by use of water from Jordan Lake can be returned to the Lake through existing treatment facilities. The rules for allocating water from Jordan Lake limit allocations to the amount of water that will be needed within 30 years.

City of Durham Application Data

City of Durham	Round 3 Jordan Lake Allocation Application Data										
	2000	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Year-round Service Population	203341	221030	240530	257166	276403	291397	298974	306550	314127	321703	329280
Percent of Estimated County Population	91%	90%	90%	89%	89%	87%	84%	81%	78%	76%	74%
Residential Use (mgd)	13.7	17.5	19.1	20.4	22.0	23.2	23.7	24.4	25.0	25.6	26.2
Residential Use (gpcd)	67	79	79	79	80	80	79	80	80	80	80
Commercial Use (mgd)	5.7	6.7	7.3	7.8	8.3	8.8	9.0	9.3	9.5	9.7	9.9
Commercial Use (gpcd)	28	30	30	30	30	30	30	30	30	30	30
Industrial Use (mgd) (included in Commercial)	1.4	2.8	3.1	3.3	3.5	3.7	3.8	3.9	4.0	4.1	4.2
Industrial Use (gpcd)	7	13	13	13	13	13	13	13	13	13	13
Institutional Use (mgd) (inc. Duke Univ & Med Center)	2.8	3.8	4.1	4.4	4.8	5.0	5.1	5.3	5.4	5.5	5.7
Institutional Use (gpcd)	14	17	17	17	17	17	17	17	17	17	17
System Processes (mgd)	2.8	2.5	2.7	2.9	3.1	3.3	3.3	3.4	3.5	3.6	3.7
System Processes (gpcd)	14	11	11	11	11	11	11	11	11	11	11
Unaccounted-for Water (mgd)	4.5	3.1	3.4	3.6	3.9	4.1	4.2	4.3	4.4	4.5	4.6
Unacct.-for Water (gpcd)	22	14	14	14	14	14	14	14	14	14	14
Total Service Area Demand (mgd)	**31.0**	**34.2**	**37.2**	**39.8**	**42.8**	**45.1**	**46.3**	**47.5**	**48.6**	**49.8**	**51.0**
Total Demand (gpcd)	152	155	155	155	155	155	155	155	155	155	155

mgd - million gallons per day

gpcd - gallons per capita day (gallons per person per day) based on service population and demand shown above



Towns of Cary and Apex

The Towns of Cary and Apex together operate the Cary-Apex water treatment plant on the eastern shore of Jordan Lake. They have constructed the only raw water intake on the lake, which also provides access for Chatham County to pump raw water to Chatham County's treatment plant. The Cary-Apex system also treats water for the Town of Morrisville and the Wake County portion of Research Triangle Park (RTP). Cary and Apex jointly hold a 21 mgd allocation from Jordan Lake. Wake County holds a 1.5 mgd allocation for RTP and Morrisville holds a 2.5 mgd allocation. Cary, Apex, Morrisville and Wake County were granted an interbasin transfer certificate in 2001 that allows them to transfer up to 24 mgd from the Haw River Basin to the Neuse River Basin, subject to several conditions.

In 2000, the Cary-Apex system used 12.7 mgd of water to meet the needs of 118,670 people. By 2030, they anticipate having a combined service area population of 316,079, requiring 31.5 mgd to meet their finished water demands. Their projected service area demands will exceed their current allocation by 2015. Cary current receives water from Raleigh and Durham. The 3.5 mgd contract with Raleigh expires in 2003 and the 3.5 mgd contract with Durham expires in 2008. Neither Raleigh nor Durham has the capacity to provide Cary with enough water to meet Cary's long-term needs. Apex has no other source of water than Jordan Lake.

Demand projections for Cary and Apex assume a declining per capita residential water use. Cary projects their residential water use to decline from 74 to 58 gallons per capita day (gpcd) over the next 30 years. Apex projects their residential water use to decline from 71 to 61 gpcd over the same period. Cary predicts an increase in per capita water use for non-residential uses from 21 to 35 gpcd while Apex predicts a decline in non-residential use from 13 to 11 gpcd.

Cary and Apex presented information on several alternatives to Jordan Lake to meet future water demands. One option is to use water from Harris Lake. This lake, located in southwestern Wake County and northeastern Chatham County, was constructed to provide cooling water for CP&L's Harris nuclear power station. The practicality of this option is in doubt since, to date, CP&L has not supported using the lake as a public water supply. They also presented the option of constructing a new reservoir on Middle Creek in partnership with local governments in Wake County and Johnston County. Besides construction of a dam, an intake and transmission lines, the project would require relocation of existing roads and bridges. This project would take at least 20 years to complete and include environmental impacts much greater than that of a Jordan Lake allocation. Cary and Apex, along with Morrisville and Wake County, also proposed using water from Kerr Lake to meet long-term water demands. This project would take at least 20 years to develop, would require study and approval by the US Army Corps of Engineers who operate Kerr Lake, and would involve new interbasin transfer issues.

Cary and Apex have requested a 23 mgd increase in their allocation for a total allocation of 44 mgd. The request is based on 2050 needs plus a 20% margin of safety. DWR reduced its recommendation for all applicants to 2030 needs, without a margin of safety. We assume that additional allocations will be considered as needed before 2030. DWR recommends an additional allocation of 11 mgd during Round Three for a total allocation of 32 mgd.

Town of Cary Application Data

Town of Cary	Round 3 Jordan Lake Allocation Application Data										
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Year-round Service Population	96217	115781	134222	152601	172653	192971	215679	236000	236000	236000	236000
Percent of Estimated County Population	15%	16%	16%	16%	16%	16%	16%	17%	15%	14%	13%
Residential Use (mgd)	7.1	8.2	9.1	10.2	11.3	12.4	12.2	13.7	13.7	13.7	13.7
Residential Use (gpcd)	74	71	68	67	65	64	57	58	58	58	58
Commercial Use (mgd)	1.8	2.3	3.0	3.9	5.0	6.0	6.9	7.4	7.4	7.4	7.4
Commercial Use (gpcd)	19	20	22	26	29	31	32	31	31	31	31
Industrial Use (mgd)	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4
Industrial Use (gpcd)	1	2	1	1	2	2	2	2	2	2	2
Institutional Use (mgd)	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4
Institutional Use (gpcd)	1	2	1	1	2	2	1	2	2	2	2
System Processes (mgd)	0.9	1.1	1.3	1.5	1.7	1.8	1.9	2.1	2.1	2.1	2.1
System Processes (gpcd)	9	10	10	10	10	9	9	9	9	9	9
Unaccounted-for Water (mgd)	0.5	0.6	0.7	0.8	1.0	1.1	1.3	1.4	1.4	1.4	1.4
Unacct.-for Water (gpcd)	5	5	5	5	6	6	6	6	6	6	6
Total Service Area Demand (mgd)	**10.5**	**12.6**	**14.5**	**16.8**	**19.6**	**22.0**	**23.0**	**25.4**	**25.4**	**25.4**	**25.4**
Total Demand (gpcd)	109	109	108	110	114	114	107	108	108	108	108

mgd - million gallons per day

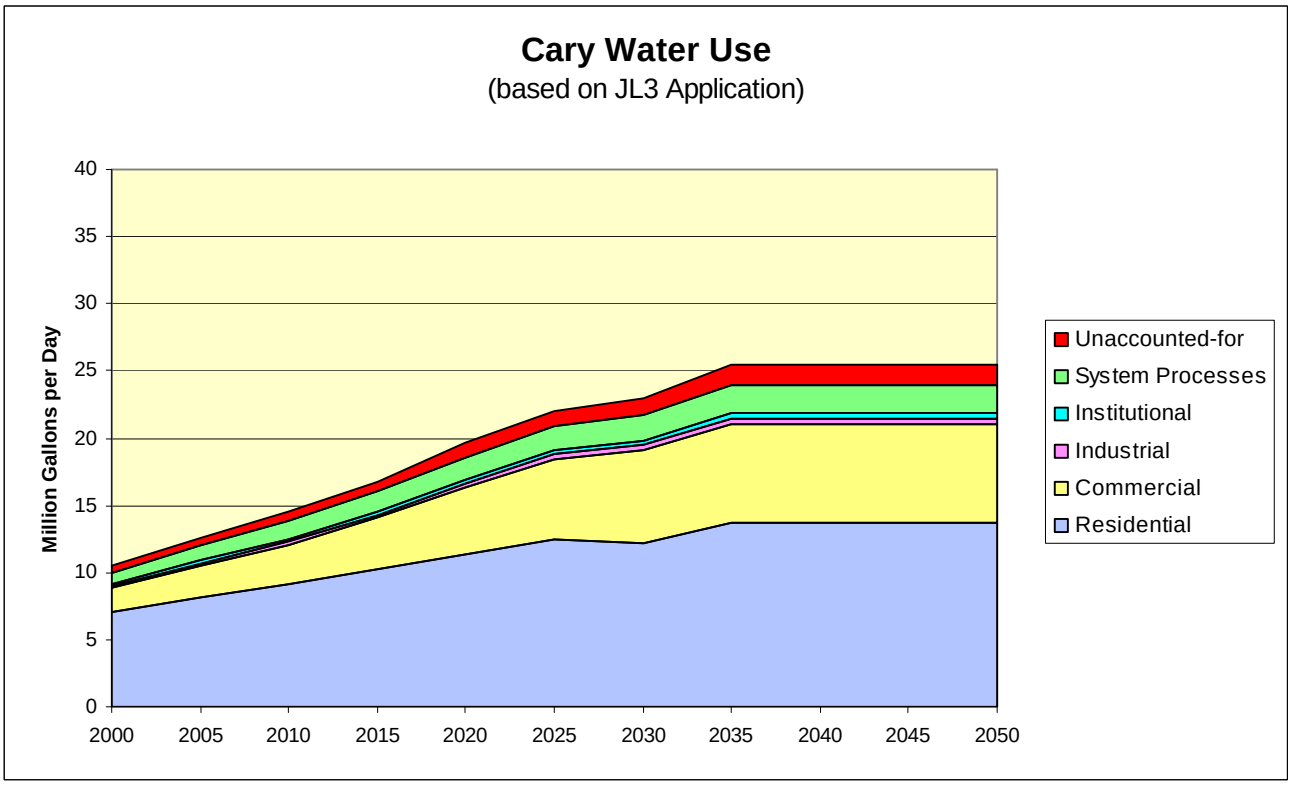
gpcd - gallons per capita day (gallons per person per day) based on service population and demand shown above

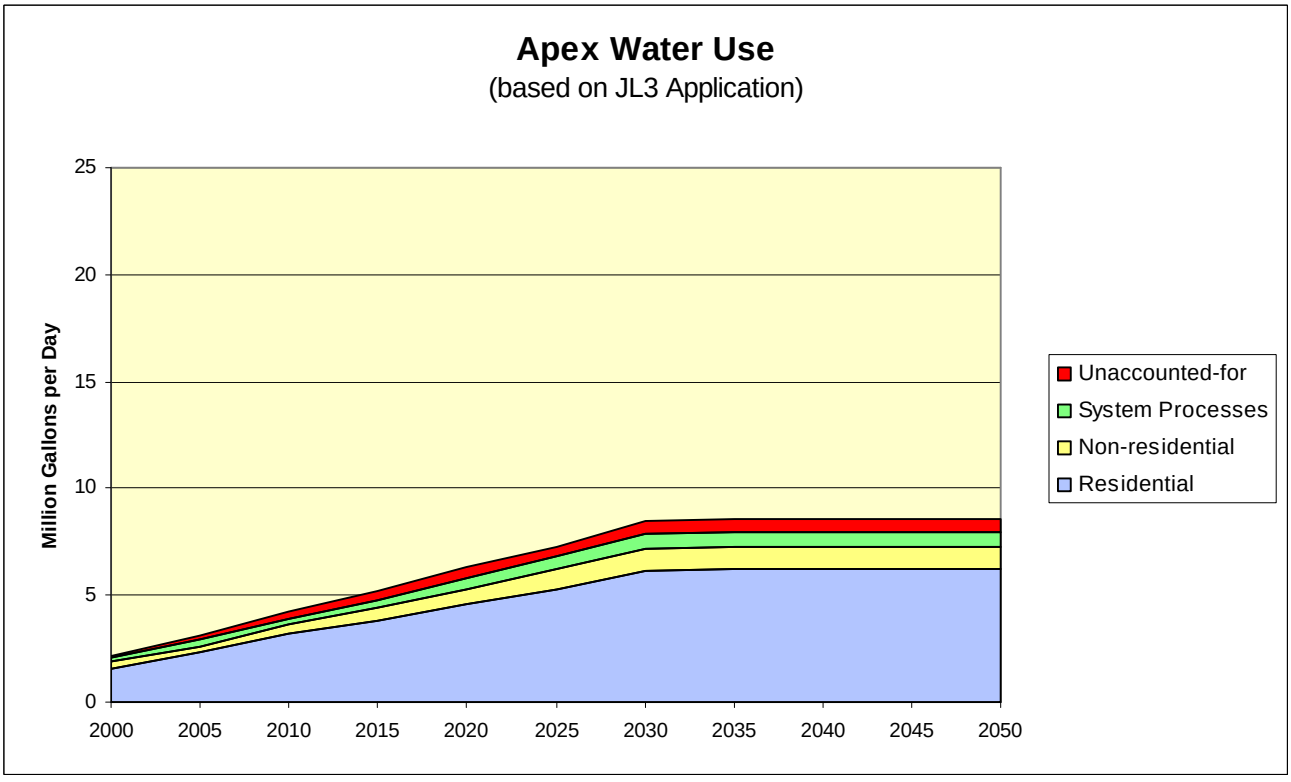
Town of Apex Application Data

Town of Apex	Round 3 Jordan Lake Allocation Application Data										
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Year-round Service Population	22453	35627	48800	61700	74600	87500	100400	102172	102172	102172	102172
Percent of Estimated County Population	4%	5%	6%	6%	7%	7%	8%	7%	7%	6%	6%
Residential Use (mgd)	1.6	2.3	3.2	3.8	4.6	5.3	6.1	6.2	6.2	6.2	6.2
Residential Use (gpcd)	71	65	66	62	62	61	61	61	61	61	61
Non-Residential Use (mgd)	0.3	0.3	0.4	0.6	0.7	0.9	1.1	1.1	1.1	1.1	1.1
Non-Residential Use (gpcd)	13	8	8	10	9	10	11	11	11	11	11
Industrial Use (mgd)											
Industrial Use (gpcd)											
Institutional Use (mgd)											
Institutional Use (gpcd)											
System Processes (mgd)	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.7	0.7	0.7	0.7
System Processes (gpcd)	9	8	6	6	7	7	7	7	7	7	7
Unaccounted-for Water (mgd)	0.1	0.2	0.3	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6
Unacct.-for Water (gpcd)	4	6	6	6	7	6	6	6	6	6	6
Total Service Area Demand (mgd)	**2.2**	**3.1**	**4.2**	**5.2**	**6.3**	**7.3**	**8.5**	**8.6**	**8.6**	**8.6**	**8.6**
Total Demand (gpcd)	98	87	86	84	84	83	85	84	84	84	84

mgd - million gallons per day

gpcd - gallons per capita day (gallons per person per day) based on service population and demand shown above


Cary Water Use
(based on JL3 Application)
Million Gallons per Day
0
5
10
15
20
25
30
35
40
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
Unaccounted-for
System Processes
Institutional
Industrial
Commercial
Residential


Apex Water Use
(based on JL3 Application)
Million Gallons per Day
0
5
10
15
20
25
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
Unaccounted-for
System Processes
Non-residential
Residential

Town of Morrisville

Morrisville currently holds a 2.5 mgd allocation from Jordan Lake and depends on the Cary-Apex system for finished water. The town has no connections with other water systems. Morrisville's wastewater is treated by Cary. While Morrisville's application presented the same alternatives to the use of Jordan Lake as Cary and Apex, in reality they are unlikely to be able to undertake any of these options on their own. For planning purposes and for this analysis it is most useful to consider Morrisville, as well as RTP-South, as components of a regional system supplied by the Cary-Apex water treatment plant.

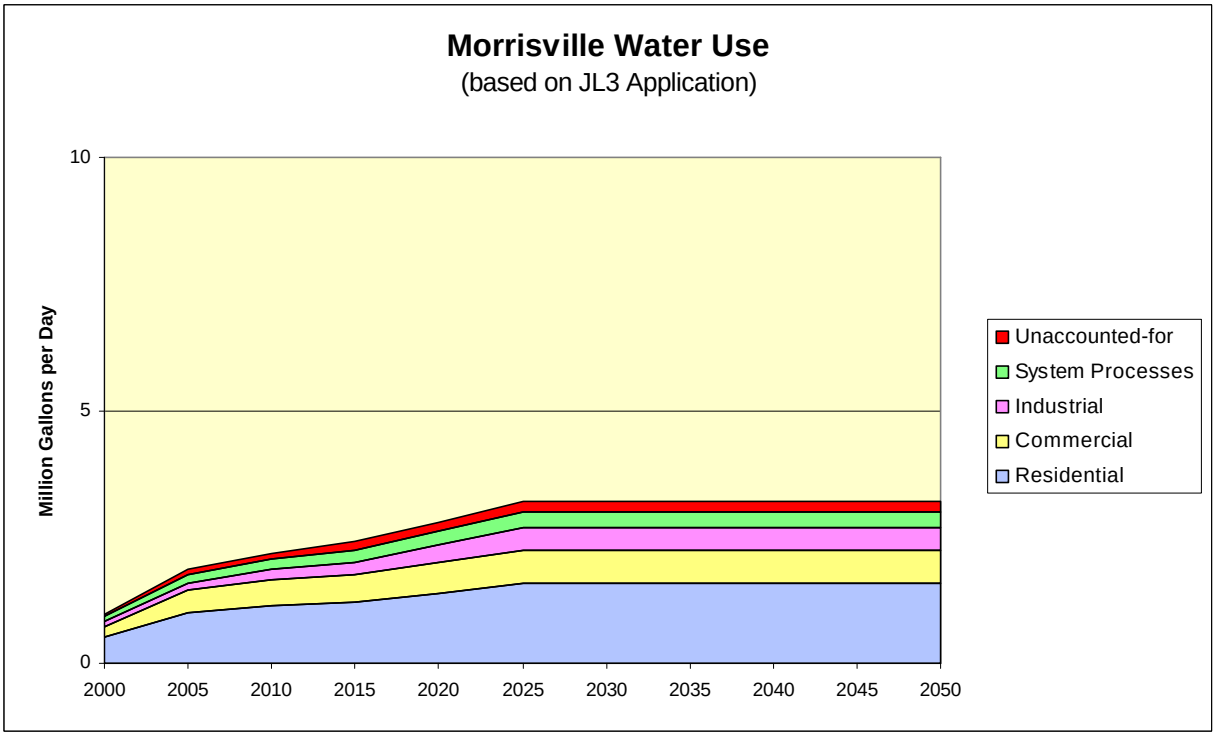
Morrisville has a defined Urban Services Area (USA) and used this USA as the maximum limit of water and sewer service for their application. Morrisville's water demand projections indicate that they will reach maximum demand within their USA by 2025. This represents an increase of 285% in service population (from 7,000 to 27,000) over the next 25 years. Morrisville's projections include a reduction in residential water use rates from 77 to 58 gallons per capita day (gpcd), and in non-residential use from 52 to 41 gpcd, over the same period. Morrisville requested a 2.5 mgd increase in their allocation. The request is based on 2050 needs plus a 20% margin of safety. DWR reduced its recommendation for all applicants to 2030 needs, without a margin of safety. We assume that additional allocations will be considered as needed before 2030. DWR recommends an additional allocation of 1 mgd during Round Three for a total allocation of 3.5 mgd. Based on their projections, this amount should meet their demand in 2030, and beyond. Morrisville's use of water from Jordan Lake and any associated interbasin transfer is limited by their interbasin transfer certificate and its conditions, approved by the EMC in July 2001. The table and graph below summarize Morrisville's demand projections.

Town of Morrisville Application Data

Town of Morrisveille	**Round 3 Jordan Lake Allocation Application Data**										
	2000	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Year-round Service Population	6500	14700	17750	20800	23900	27000	27000	27000	27000	27000	27000
Percent of Estimated County Population	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Residential Use (mgd)	0.5	1.0	1.1	1.2	1.4	1.6	1.6	1.6	1.6	1.6	1.6
Residential Use (gpcd)	77	67	63	58	58	58	58	58	58	58	58
Commercial Use (mgd)	0.2	0.5	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7
Commercial Use (gpcd)	35	31	30	26	26	25	25	25	25	25	25
Industrial Use (mgd)	0.1	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
Industrial Use (gpcd)	17	10	11	12	14	16	16	16	16	16	16
Institutional Use (mgd)											
Institutional Use (gpcd)											
System Processes (mgd)	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
System Processes (gpcd)	12	11	11	11	11	11	11	11	11	11	11
Unaccounted-for Water (mgd)	0.05	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Unacct.-for Water (gpcd)	8	8	7	8	8	8	8	8	8	8	8
Total Service Area Demand (mgd)	**1.0**	**1.9**	**2.2**	**2.4**	**2.8**	**3.2**	**3.2**	**3.2**	**3.2**	**3.2**	**3.2**
Total Demand (gpcd)	149	127	123	115	117	119	119	119	119	119	119

mgd - million gallons per day

gpcd - gallons per capita day (gallons per person per day) based on service population and demand shown above



Wake County for Research Triangle Park

The Research Triangle Park (RTP) is a major driver of the regional economy and its prosperity affects the neighboring communities seeking allocations from Jordan Lake during Round Three. The portion of RTP within Durham County receives water from the Durham water system and is included in Durham's industrial water demand projection. The portion of RTP located in Wake County (RTP-South), approximately 20% of RTP's buildable area, receives water from Jordan Lake through the Cary-Apex water system. Wake County currently holds a 1.5 mgd allocation for use by RTP. Like Morrisville, RTP-South's future water supply is dependent on the Cary-Apex system. Wake County developed their water demand projections based on water use per square foot of facilities and on their historic patterns of development. Wake County divided RTP-South's potential facilities into biotechnical and non-biotechnical sectors, because of their significantly different water use requirements and developed separate water demand projections for each category. Based on the projections in the application, water demands will exceed RTP-South's available supply by 2010. The table and graph below summarize the water demand projections in their application.

Wake County requested an increase of 4 mgd in their allocation for RTP for a total allocation of 5.5 mgd. The request is based on 2050 needs plus a 20% margin of safety. DWR reduced its recommendation for all applicants to 2030 needs, without a margin of safety. We assume that additional allocations will be considered as needed before 2030. DWR recommends an additional allocation of 2 mgd during Round Three for a total allocation of 3.5 mgd. RTP-South's use of water from Jordan Lake and any associated interbasin transfer is limited by their interbasin transfer certificate and its conditions, approved by the EMC in July 2001.

Wake County-Research Triangle Park South Application Data

Wake County - Research Triangle Park	Round 3 Jordan Lake Allocation Application Data									
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045
Square feet of biotechnical facilities	209,800	415,840	621,880	827,920	1,033,960	1,240,000	1,240,000	1,240,000	1,240,000	1,240,000
Square feet of non-biotechnical facilities	1,605,425	2,210,560	2,822,746	3,439,883	4,060,631	4,684,093	5,515,687	6,348,928	7,183,487	8,019,119
Total facility square footage	1,815,225	2,626,400	3,444,626	4,267,803	5,094,591	5,924,093	6,755,687	7,588,928	8,423,487	9,259,119
estimated number of employees	4619	6627	8635	10642	12650	14658	16666	18674	20682	22690
Biotechnical Facilities (mgd)	0.1	0.5	0.7	0.9	1.1	1.3	1.3	1.3	1.3	1.3
Biotechnical facilities (gpsf)	0.5	1	1	1	1	1	1	1	1	1
Non-biotechnical Facilities (mgd)	0.2	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.1	2.3
Non-biotechnical facilities (gpsf)	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
System Processes (mgd)	0.02	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3
System Processes (gpsf)	0.01	0.04	0.03	0.05	0.04	0.03	0.04	0.04	0.04	0.03
Unaccounted-for Water (mgd)	0.02	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
Unacct.-for Water (gpsf)	0.01	0.04	0.03	0.02	0.02	0.03	0.03	0.03	0.02	0.02
Total Service Area Demand (mgd)	0.3	1.3	1.7	2.2	2.6	3.1	3.4	3.6	3.9	4.1
Total Demand per square foot (gpsf)	0.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4
Demand per employee (gped)	74	196	197	207	206	211	204	193	189	181

mgd - million gallons per day

gpsf - gallons per square foot

gped - gallons per employee day