2002 ANNUAL REPORT on INTERBASIN TRANSFERS
for
RTP South and the Towns of Cary, Apex, and Morrisville

Prepared for:

Town of Cary

Town of Apex

Town of Morrisville

RTP South/Wake County

Submitted to:

North Carolina Division of Water Resources

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Executive Summary

The 2002 Annual Report on Interbasin Transfers for RTP South and the Towns of Cary, Apex, and Morrisville includes monitoring data for daily tracking of IBT amounts and combined Jordan Lake allocations held by the certificate holders as well as monitoring of individual Jordan Lake allocations on a monthly basis. The 2002 Annual Report also includes special submittals by each of the certificate holders to document compliance with IBT certificate condition 7 (Water Shortage Response Plan) and condition 8 (stream buffer rules).

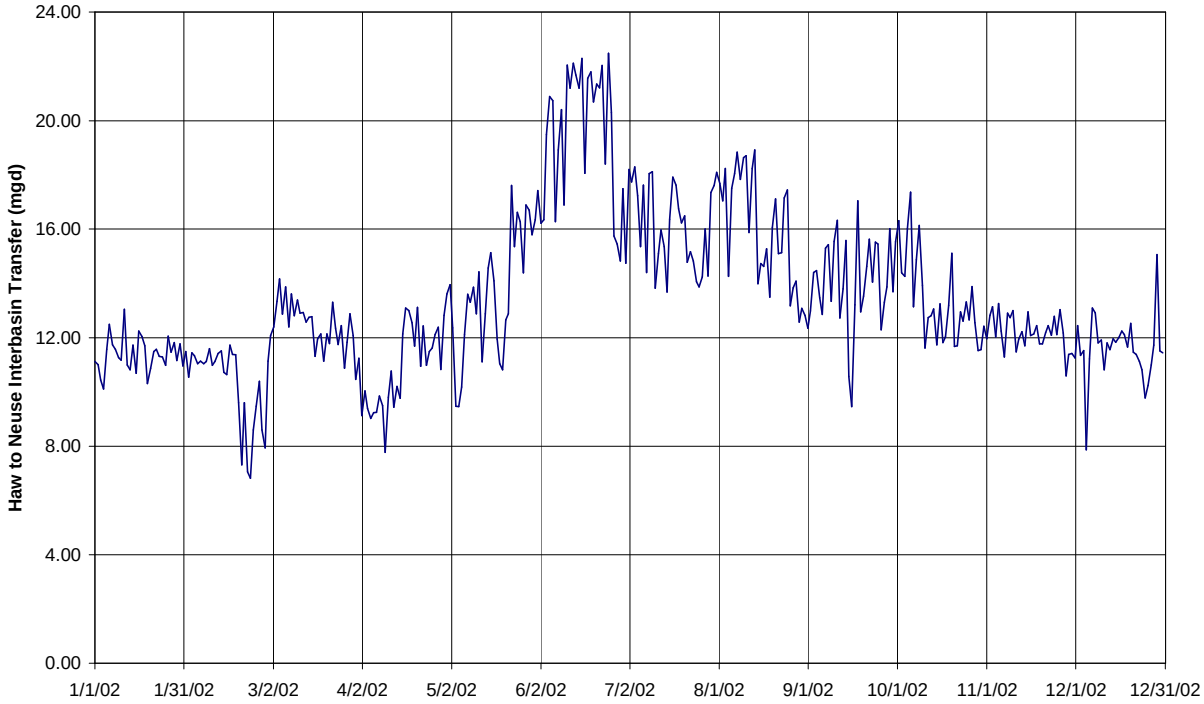
In 2002, the certificate holders complied with all conditions of their IBT certificate. Summaries of IBT amounts for the year are included in Table ES-1. The maximum daily IBT amount for Cary, Apex, Morrisville, and RTP South was 22.5 mgd. The annual average IBT amount was 13.5 mgd. IBT amounts and a summary of Jordan Lake withdrawals are provided in Table ES-1. The daily IBT amounts in 2002 for Cary, Apex, Morrisville, and RTP South are shown in Figure ES-1.

TABLE ES-1.
Summary of InterBasin Transfers for Cary, Apex, Morrisville and RTP South

	Withdrawal from Haw Subbasin (mgd)[1]		**Total Return to Haw Subbasin (mgd)**		**Interbasin Transfer (mgd)**		**IBT as % of Certificate**
Calendar Year	Average Annual	Max. Day	Average Annual	Max. Day	Average Annual	Max. Day	Max.
1998	10.8	15.7	1.7	3.5	9.0	14.3	90%
1999	9.2	15.6	1.6	4.2	7.6	12.9	81%
2000	7.3	14.2	1.1	4.4	6.2	11.8	74%
2001[2]	9.7	18.8	2.8	9.4	6.8	15.0	63%[3]
2002	16.9	29.2	3.5	10.3	13.5	22.5	94%

1. Includes water use by Cary, Apex, Morrisville, and RTP South.
2. Withdrawals in 2001 were unusually high due to construction activities at the Cary/Apex WTP and do not reflect actual potable water demands.
3. Permitted IBT amount increased from 16 mgd to 24 mgd in July 2001. The maximum day IBT of 15.0 mgd occurred after the permitted amount increased to 24 mgd.

Figure ES-1: Daily Interbasin Transfer for Apex, Cary, Morrisville and RTP South [Haw Sub-Basin to Neuse Sub-Basin]



1.0 Jordan Lake Allocation Monitoring

The combined Jordan Lake water supply allocation for Cary, Apex, Morrisville, and RTP South can be tracked on a daily basis. Daily tracking of the combined Jordan Lake allocation for the period January 1, 2002 through December 31, 2002 is included in Appendix A. The water supply pools for each allocation holder were full on January 1, 2002.

For 2002, the maximum day withdrawal for all certificate holders was 29.2 mgd, which occurred on June 25. The average daily withdrawal for all certificate holders was 16.9 mgd during 2002 (Table 1-1). It should be noted that water withdrawals during early 2002 were unusually high due to construction at the Cary / Apex WTP and do not reflect potable water demands by customers. While raw water withdrawals averaged 16.9 mgd, the net finished water delivered by the Cary / Apex WTP to the distribution system was 14.2 mgd in 2002.

TABLE 1-1
Summary of Jordan Lake Withdrawals[1]

Year	Average Annual Withdrawal (mgd)	Maximum Daily Withdrawal (mgd)
1998[2]	10.8	15.7
1999[2]	9.2	15.6
2000	7.3	14.2
2001	9.7	18.8
2002	16.9	29.2

1. Withdrawals from Jordan Lake at the Cary/Apex raw water intake. Includes water use by Apex, Cary, Morrisville and RTP South. Does not include water use by Durham.
2. Includes water use by Holly Springs from 1/1/98 to 6/30/99

Table 1-2 presents historical water use for the certificate holders (Cary, Apex, Morrisville, and RTP South) based on finished water produced at the Cary / Apex WTP. In 2002, finished water demands averaged 14.9 mgd and the maximum day demand was 25.6 mgd. The maximum day peaking factor was 1.72 in 2002.

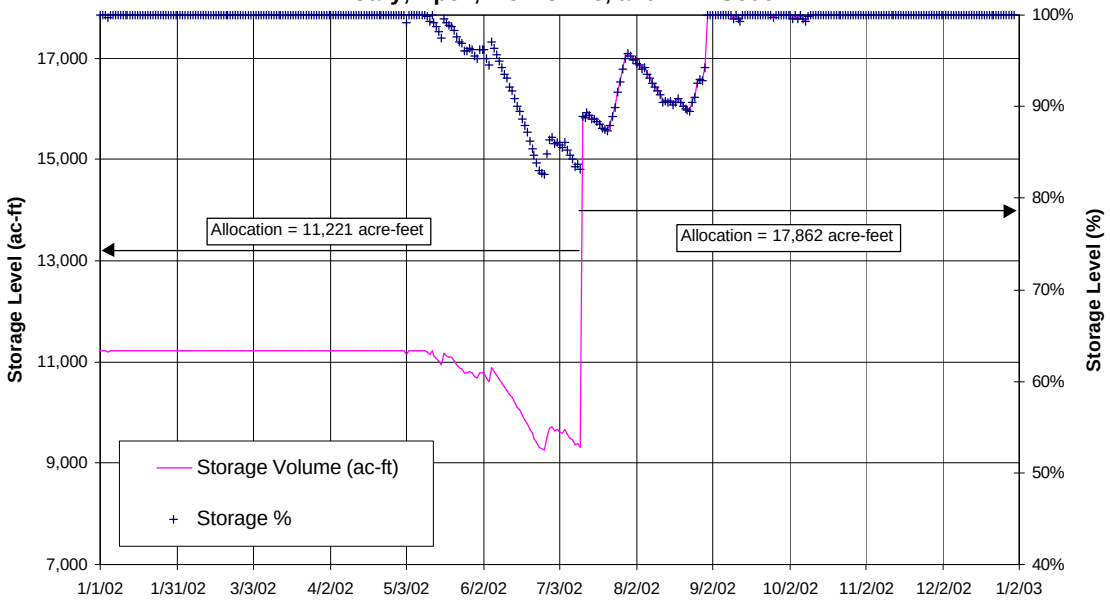
TABLE 1-2
Summary of Finished Water Demands

Year	Average Annual Demand (mgd)	Maximum Daily Demand (mgd)	Maximum Day/Average Day Peaking Factor
1998[2]	12.2	20.1	1.64
1999[2]	12.6	21.5	1.70
2000	13.0	21.6	1.66
2001	14.1	22.0	1.56
2002	14.9	25.6	1.72

1. Includes finished water delivered to the distribution system by the Cary/Apex WTP.
2. Includes water use by Holly Springs from 1/1/98 to 6/30/99.

Water use for Morrisville and RTP South is not measured on a daily basis. Therefore, accurate daily tracking of Jordan Lake water supply allocations can only be performed for the combined Jordan Lake water supply allocation for Cary, Apex, Morrsiville, and RTP South. Their combined Level I allocation was increased from 24.5% of the water supply to 39% of the water supply pool on July 12, 2002. Figure 1 shows the combined storage level for Cary, Apex, Morrsiville, and RTP South on a daily basis from January 1 through December 31, 2002. The minimum storage level for the combined allocation was 91%, occurring on several days in December 2002 when drought conditions persisted in the

Figure 1. Tracking of Combined Jordan Lake Water Supply Storage Allocation for Cary, Apex, Morrisville, and RTP South



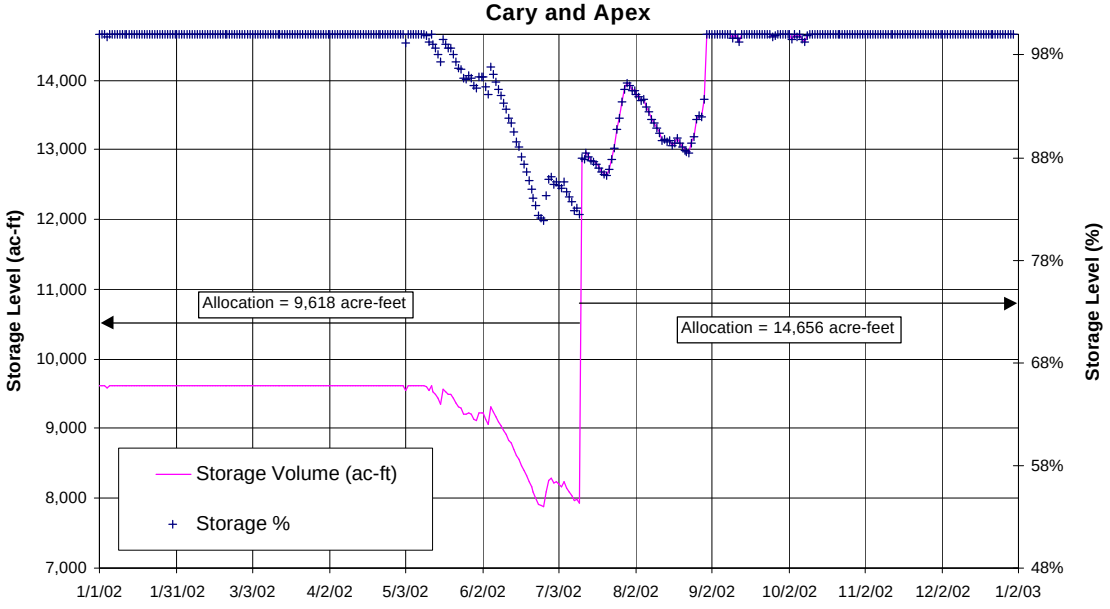
region. The average percent storage was 98% from April through December 2002.

Individual Jordan Lake water allocations are estimated on a daily basis by estimating daily water usage for Morrisville and RTP South from monthly records. Daily water use for Morrisville is estimated from monthly or more frequent retail meter readings by assuming that water usage variations between meter readings follow the same patterns as the total combined water use ("Net Cary" use). Daily water use for RTP South is estimated similarly using monthly retail meter readings. by assuming that water usage trends throughout the month follow similar patterns as for Cary. For a given day, the ratio of daily Net Cary water use to average net Cary water use for the period between meter readings is applied to Morrisville and RTP South metered water use. Levels in individual water supply pools are calculated on a daily basis using daily water use estimates and daily lake inflows. Lake inflow data is obtained from the US Army Corps of Engineers and allocated to each water supply pool according to the percentage allocation held. Any inflow amount that would fill the allocated storage above 100 percent is not stored. Any time the elevation in Jordan Lake is at or above 216 feet mean sea level, the water supply pools are reset to 100 percent full.

Daily tracking of the Cary / Apex water supply storage allocation is shown in Figure 2. The daily withdrawal amounts are estimated by subtracting the estimated daily Morrisville and

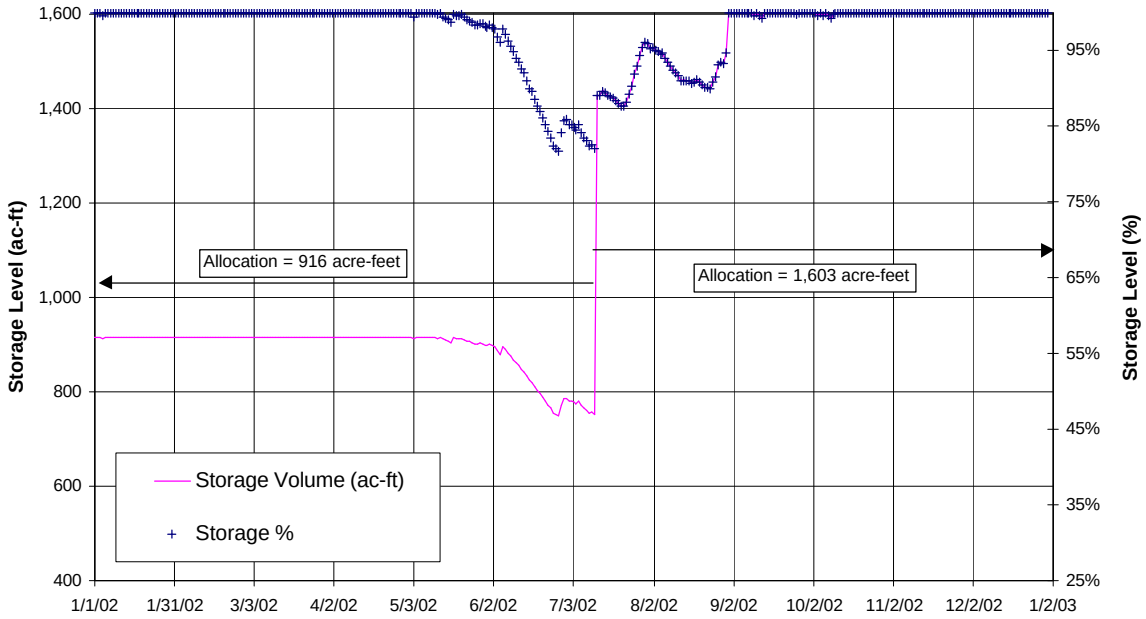
RTP amounts from the metered total daily use. Cary / Apex holds a water supply storage allocation equal to 32 percent of the water supply pool or 9,618 acre-feet. The minimum storage level for Cary / Apex was 88%, occurring in December 2002. The average percent storage was 97.5% from April through December 2002.

Figure 2. Tracking of Combined Jordan Lake Water Supply Storage Allocation for Cary and Apex



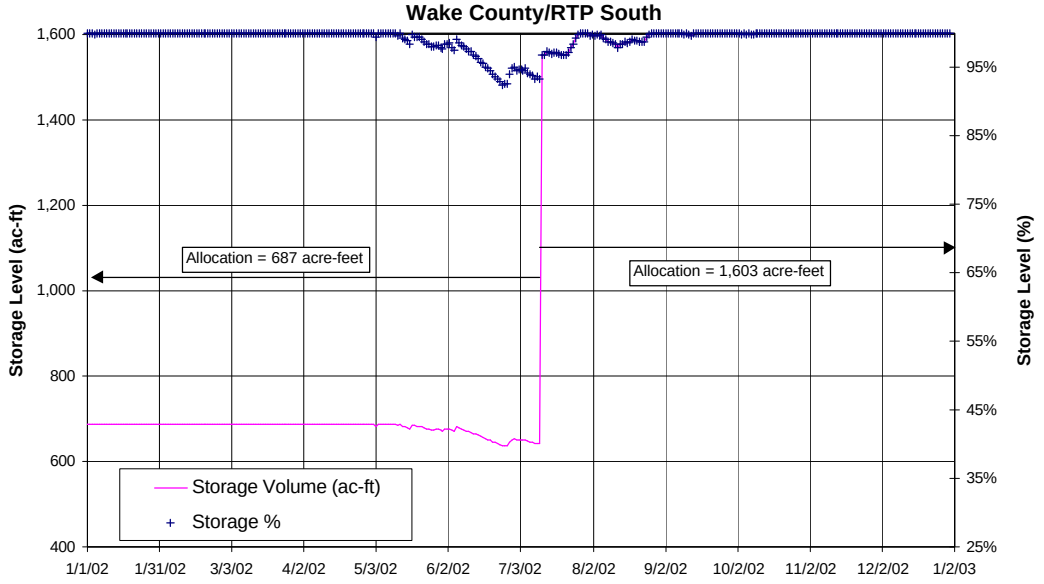
Daily tracking of the water supply storage allocation for the Town of Morrisville is shown in Figure 3. The Town of Morrisville had a bulk purchase contract with the City of Durham for up to 1.2 mgd of finished water through May 2002. Therefore, purchases from the City of Durham reduced the amount of water needed from the Town's water supply storage pool during early 2002. The Town's storage level was nearly full during the period from April through December 2002 with a minimum level of 98% occurring in December.

Figure 3. Tracking of Combined Jordan Lake Water Supply Storage Allocation for Morrisville



RTP South purchased up to 0.5 mgd of finished water from the City of Raleigh from June 20, 2002 through Oct. 31, 2002. Therefore, total Jordan Lake withdrawals for RTP South were zero from June to October 2002, with the exception of two days where demands peaked above 0.5 mgd. Daily tracking of the storage level for the RTP South water supply storage allocation is shown in Figure 4. The RTP South water supply pool remained nearly full during April through December 2002 with a minimum of 98% occurring in December.

Figure 4. Tracking of Combined Jordan Lake Water Supply Storage Allocation for Wake County/RTP South



2.0 IBT Monitoring

Daily IBT estimates for the certificate holders are included in Appendix B. Estimates are provided for the period January 1, 2002 through December 31, 2002. ***The maximum day IBT transfer during the calendar year 2002 was 22.5 mgd, which occurred on June 25, 2002***. This represents 93.7 percent of the permitted IBT transfer under the certificate approved by the EMC on July 12, 2001. The annual average IBT transfer was 13.5 mgd during calendar year 2002.

The average daily consumptive use was 20% for the period January 1, 2002 through December 31, 2002. Historical consumptive use is shown in Table 2-1.

The distribution of consumptive uses between the Haw, Cape Fear, and Neuse River subbasins for 2002 was based on historical water use in each basin as determined by billing records for each certificate holder. For 2002, it was assumed that 14% of water use occurred in the Haw subbasin, 0.6% of water use occurred in the Cape Fear subbasin, and 85.4% of water use occurred in the Neuse River subbasin. The certificate holders have begun tracking historical use by assigning a subbasin to each customer. Data on the distribution of water use between subbasins for each entity from 2000 through 2002, based on billing records, is shown in Table 2-2.

In 1998, 1999, and 2000 Apex and Cary implemented mandatory irrigation restrictions due to water supply limitations and IBT permit restrictions. The Town of Morrisville asked residents to voluntarily conserve water beginning in 1998, and implemented mandatory water use restrictions in July 1999. The restrictions reduced consumptive water use from what would normally be expected during those years. In 2002 all the Towns had mandatory restrictions because of regional drought conditions, but they were implemented after June, which was when all-time high water use occurred. Appendix C summarizes the 2002 water use restrictions.

TABLE 2-1
Historical Consumptive Use for Cary, Apex, Morrisville, and RTP South

Year	Average Daily Finished Water Demand (mgd)	Average Daily Consumptive Use (mgd)	% Consumptive Use
1998[1]	12.2	2.4	19.7%
1999[1]	12.6	2.1	16.7%
2000	13.0	1.8	13.8%
2001	14.1	2.0	14.7%
2002	14.9	3.0	20.0%

1. Includes some water use by Holly Springs. Holly Springs purchased water from Apex in 1998 and 1999.

Table 2-3 shows the combined water use for each of the certificate holders and the percentage water use in the Haw and Cape Fear River Subbasins.

TABLE 2-3
Historical Water Use in the Haw and Cape Fear River Subbasins for Cary, Apex, Morrisville, and RTP South

Year	Total Billed Water Use (mgd)	Water Use in Haw Subbasin (mgd)[1]	Percent Use in Haw Subbasin	Water Use in Cape Fear Subbasin (mgd)[1]	Percent Use in Cape Fear River Subbasin
2000	12.07	1.97	16.3%	0.07	0.6%
2001	13.97	2.47	17.7%	0.08	0.6%
2002	13.95	3.05	21.8%	0.08	0.6%

1. Water use by subbasin for the Town of Morrisville is unavailable for 2000, and so was assumed to be the same as in 2001.

For purposes of calculating daily IBT amounts in 2002, the certificate holders used 19% for the portion of their water use that occurred in the Haw subbasin and 0.6% as the portion used in the Cape Fear subbasin. For purposes of calculating daily IBT amounts in 2003, the certificate holders estimate that 23% of their water use will occur in the Haw subbasin and that 0.6% of their water use will occur in the Cape Fear subbasin.

TABLE 2-2
Distribution of Water Billed to Retail Customers by River Subbasin

Year	Cary			Apex					Morrsville[1]			RTP South		
	Total Water Use (mgd)	Water Use in Haw (mgd)	% Use in Haw	Total Water Use (mgd)	Water Use in Haw (mgd)	% Use in Haw	Water Use in Cape Fear (mgd)	% Use in Cape Fear[1]	Total Water Use (mgd)	Water Use in Haw (mgd)	% Use in Haw[2]	Total Water Use (mgd)	Water Use in Haw (mgd)	% Use in Haw
2000	9.29	0.82	8.8%	1.65	0.82	49.9%	0.07	4.3%	0.86	0.05	6.20%	0.27	0.27	100%
2001	10.73	1.07	10.0%	1.88	1.03	54.8%	0.08	4.3%	1.05	0.06	6.20%	0.31	0.31	100%
2002	10.23	1.23	12.0%	2.15	1.29	60.0%	0.08	3.7%	1.18	0.14	11.2%	0.39	0.39	100%

1. Water use by basin for the Town of Morrisville is unavailable for 2000, and so was assumed to be the same as in 2001.

3.0 Compliance with Certificate Conditions

A summary of the conditions of the IBT certificate dated July 12, 2001 along with the current status of compliance for each is provided below.

Condition 1 (2010 Required Return)

The holders of the certificate, after 2010, shall return water supplied from the Haw River Basin used in the Neuse River Basin to either the Haw or Cape Fear River Basins as described below.

a) Any water use in the Neuse Basin in excess of 16 million gallons per day adjusted on an average daily basis shall be returned.

b) *Water used for consumptive purposes in the Neuse Basin will not be subject to this condition*

Compliance with this condition is not required until after 2010. However, the calculations for determining compliance with Condition 1 are shown in Table 3-1. Note that revised calculations for 2001 result in different values then were included in the 2001 Annual Report.

Wake County, Cary, Apex and Morrisville are participating in the Western Wake County Regional Wastewater Treatment Study along with Holly Springs and Fuquay-Varina. The partners expect to select an alternative for implementation in the summer of 2004. More information about the status of the study can be found on Cary's website at http://www.townofcary.org/depts/pwdept/capefear/index.htm.

TABLE 3-1
Summary of Compliance with Certificate Condition No. 1

Year	Neuse Finished Water from the Haw (mgd)	Peaking Factor	16 mgd MDD adjusted to ADD	Consumptive Use Factor (%)	Neuse Consumptive Use (from the Haw) (mgd)	Required Return if After 2010 (mgd)	Amount Returned (mgd)
	(a)	(b)	(c)=16/(b)	(d)	(e)=(a)*(d)	(f)=(a)-(c)-(e)	(g)
2001	6.8	1.64	9.8	20%	1.4	0.0	0
2002	13.5	1.64	9.8	20%	2.7	1.0	0

a = Average annual transfer from Haw to Neuse (see Table B-1)
b = Peaking factor specified in Certificate for first year, and to be approved by DWR thereafter
d = Percent consumptive use specified in Certificate for first year and to be approved by DWR thereafter
g = Average annual wastewater discharges and water reuse in Haw and Cape Fear Basins (see Table B-1)

Condition 2 (Facilitate Allocation Use)

The holders of this certificate shall manage the authorized transfer amount in such a way that none of the individual petitioners (Towns of Cary, Apex, Morrisville, and Wake County [for RTP South]) are prevented from fully using their respective Jordan Lake water supply allocations.

The IBT was not a limitation on Jordan Lake withdrawals for any of the allocation holders in 2002.

Condition 3 (Disagreggation of IBT Amount)

If the certificate holders discontinue their cooperative service agreement with each other, the maximum day permitted transfer will be adjusted by the Division of Water Resources based on the 2030 projected of each applicant at that time.

The cooperative service agreements between the certificate holders have remained in effect during 2002.

Condition 4 (Compliance and Monitoring Plan)

Prior to transferring water under this certificate, the holders of this certificate shall work with the Division of Water Resources to develop compliance and monitoring plan subject to approval by the Division. The plan shall include methodologies and reporting schedules for reporting the following information: maximum day transfer amounts, compliance with permit conditions, progress on mitigation measures, drought management, and reporting. A copy of the approved plan will be kept on file with the Division for public inspection. The Division of Water Resources shall have the authority to make modifications to the compliance and monitoring plan as necessary to assess compliance with the certificate.

Cary, Apex, Morrisville, and RTP South submitted a Compliance and Monitoring Plan concurrent with the submittal of the 2001 report. The certificate holders request to modify the Compliance and Monitoring Plan such that the annual reports are due by May 1 of the following year.

Condition 5 (EMC Consideration of Impacts)

If either the EIS is found at a later date to be incorrect or new information becomes available such that the environmental impacts associated with this transfer are substantially different from those projected impacts that formed the basis for the above Findings of Fact and this certificate, the Commission may reopen the certificate to adjust the existing conditions or require new conditions to ensure that the detriments continue to be mitigated to a reasonable degree.

This condition requires no action by the certificate holders.

Condition 6 (Intake Access)

The Towns of Cary and Apex shall be required to provide access at their existing intake site to other Jordan Lake water allocation holders that need access to utilize their allocation to the extent that this additional use is determined to be feasible by the Division of Water Resources. The cost associated with getting the necessary permits, engineering design, and associated construction costs are the responsibility of the allocation holder(s) requesting the access and not Cary and Apex.

The Town of Cary has continued to provide retail water service to RTP South and has a bulk purchase agreement with the Town of Morrisville. The Towns of Cary and Apex have also entered into an agreement to allow Chatham County access to the Cary / Apex raw water intake on Jordan Lake.

Condition 7 (Drought Management Plan)

Prior to transferring water under this certificate, the Towns of Cary, Apex, and Morrisville, and Wake County (for RTP South) shall develop individual water shortage response plans subject to approval by the Division. The holders of this certificate shall develop a drought management plan for the interbasin transfer, incorporating the individual water shortage response plans and subject to

approval by the Division. The plans shall tie specific water conservation actions to the percent storage remaining in each of the petitioners' Jordan Lake water supply accounts. A copy of the approved plans shall be kept on file with the Division for public inspection. The Division of Water Resources shall have the authority to approve modifications to the drought management plan as necessary.

Water Shortage Response Plans for each certificate holder were submitted as attachments to the 2001 Annual Report.

Condition 8 (Stream Buffer Rules)

Within six months from the effective date of this certificate, the Towns of Cary, Apex, and Morrisville, and Wake County (for RTP South) shall enact ordinances similar to or more protective than the Neuse River buffer rules (15A NCAC 2B.0233) for the parts of their jurisdictions that are within the Jordan Lake watershed. These buffer requirements shall be subject to approval by the Division of Water Resources after consultation with the Division of Water Quality and shall be adopted as local ordinances.

Each Town's buffer ordinance was submitted with the 2001 Annual Report. There were no changes in 2002.

Appendix A:

Daily Tracking of Combined Jordan Lake Water Supply Allocations for 2002

Appendix B

Daily Interbasin Transfer Estimates for 2002

Appendix C

Water Use Restrictions for 2002

Apex Water Restrictions:

On July 10, 2002, the Town of Apex initiated Stage II – Moderate Mandatory water restrictions. This Stage restricts water usage to alternate days with no irrigation on Mondays.

On August 26, 2002, the Town went to Stage III - Severe Mandatory Conservation. This Stage prohibits irrigation of any kind.

On September 3, 2002, after the heavy rains over the Labor Day Weekend, the Town relaxed the restrictions back to Stage II. The current level of restrictions remains at Stage II at this time.

Cary Water Restrictions:

Under Cary's year-round alternate day watering law, automated outdoor watering of grass, gardens, bushes, and other landscape materials is limited to three days a week depending on the property's street address.

- Odd number street addresses may sprinkle and use other automated watering systems only on Tuesdays, Thursdays, and Saturdays.
- Even number addresses may sprinkle outdoors only on Wednesdays, Fridays, and Sundays.
- NO AUTOMATED OUTDOOR WATERING IS ALLOWED ON MONDAYS.
- Watering by hand is okay any day of the week.

Cary's law does not affect outdoor washing of any kind.

On August 8, 2002, water customers in Cary were restricted to watering outdoors using automated devices such as sprinklers and irrigation systems according to the following schedule:

	MON	TUES	WED	THURS	FRI	SAT	SUN
Residential	**NO**	Odd	Even	**NO**	**NO**	Odd	Even
Non-residential	NO	Odd	Even	NO	NO	NO	NO
HANDWATERING OK EVERY DAY							

On August 14, 2002, Cary announced that it would not be granting any exemptions from the restrictions for reseeding of grass lawns.

On October 22, 2002, Cary returned to its regular year-round alternate day watering schedule, as described above.

Morrisville Water Restrictions:

The Town of Morrisville implemented a mandatory watering conservation policy effective July 1, 2002 – October 16, 2002. All irrigation systems and portable sprinklers were restricted to the following water conservation schedule:

Monday, Tuesday, Wednesday: No usage of irrigation systems or portable sprinklers allowed.

Thursday, Saturday: Even addresses can water between 8:00 pm and 8:00 am.

Friday, Sunday: Odd addressess can water between 8:00 pm and 8:00 am

Hand watering, pressure washing, car washing and other outdoor uses were not restricted. Exemptions were allowed for new sod/vegetation, large existing trees of historical value, and new developments required to landscape by the Zoning Ordinances.

On October 17, 2002, Morrisville relaxed the restrictions to allow in-ground irrigation system and portable sprinkler use on an Alternative Odd/Even Watering Schedule with no time restrictions. Even addresses can water on even dates; odd addresses can water on odd dates.

RTP South Water Restrictions:

Businesses in RTP South voluntarily reduced their water use using a variety of measures, including restricted outdoor watering.