Application for Jordan Lake Water Supply Allocation

Submitted By

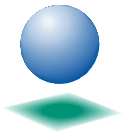
The Town of Holly Springs

Submitted to

North Carolina Division of Water Resources

May 2001

Prepared by



CH2MHILL

3125 Poplarwood Court

Suite 304

Raleigh, NC 27604

THE TOWN OF
Holly
Springs

May 31, 2001

Mr. John Morris, Director
Division of Water Resources
P.O. Box 27687
Raleigh NC 27604

Subject: Jordan Lake Water Supply Storage Allocation Application – Round 3

Dear Mr. Morris:

To meet long-term potable water demands, the Town of Holly Springs is requesting a water supply allocation for Jordan Lake. Accordingly, the Town of Holly Springs is prepared to enter into the required financial agreement with the State of North Carolina for reimbursement of the construction and operation and maintenance costs associated with the water supply pool of Jordan Lake to the U.S. Army Corps of Engineers.

Allocation Request

With this application, which is supported by the attached technical report, the Town of Holly Springs is requesting approval of the following water supply allocations:

Level I:	10.0 mgd
Level II:	6.0 mgd

In summary, an allocation of 16 MGD in addition to the Town's existing 2 MGD allocation should allow the Town to meet average day demands through 2050, as shown below, while maintaining average demand at 80 percent of available supply.

P.O. Box 8
128 S. Main Street
Holly Springs, N.C. 27540

(919) 552-6221

Fax: (919) 552-5569

Mayor's Office Fax:
(919) 552-0654

Year	Total Average Day Demand (MGD)	Water Supply Required to Maintain Average Day Demand at 80% of Available Supply
2000	0.9	1.2
2010	4.4	5.4
2020	8.3	10.4
2030	12.2	15.2
2040	14.7	18.3
2050	15.3	19.1

The Town currently has 5.2 MGD of potential water supply including a 1.2-MGD contract for finished water from the City of Raleigh, a 2.0-mgd contract for finished water from Harnett County, and an existing 2.0-MGD allocation from the Jordan Lake water supply pool. However, the 1.2-mgd contract with Raleigh will expire in 2017 and Raleigh cannot guarantee that the contract will be renewed. The contract with Harnett County expires after 2035.

The Town is considering the following two options to access its existing Jordan Lake water supply allocation plus additional allocation granted during Round 3:

1. Participate in future expansion of the Harnett County Regional WTP, to access its allocation, or
2. Construct a new raw water intake and treatment facility on the Cape Fear River.

With the total water supply capacity of 5.2 MGD, the Town will experience a water supply deficit by 2010 to meet ***average*** day demands. The Town's long-term water supply needs total approximately 19 MGD (average daily demand) to provide sufficient water supply through 2050. *Note that physical water deficits will actually occur prior to 2010, due to peak demands.*

The attached application demonstrates that Jordan Lake is the most economical, environmentally compatible and expeditious alternative available to the Town of Holly Springs. The Town of Holly Springs would

return the water directly to the Cape Fear River basin through its Utley Creek WWTP and potentially, through a discharge directly into the Cape Fear River basin. Therefore, a water supply allocation from Jordan Lake would result in essentially "no net loss" of water quantity and availability for downstream users. The Town's other water supply alternatives require withdrawal from the Neuse River basin, and therefore, would represent an increased interbasin basin transfer.

I appreciate your consideration of this application and would like to thank your staff for their assistance in preparation of this application. If you have any questions, or require additional information, please contact me at 919/557-3926.

Sincerely,

TOWN OF HOLLY SPRINGS

Stephanie L. Sudano. P. E.
Director of Engineering

Cc: Mayor Parrish Womble
Carl Dean, Town Manager
Town Commissioners
B. Scott Mitchell, E.I., L.S.S., Town Engineer

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1. Water Demand Forecast

1.1 Methodology

Water demand forecasts for the Holly Springs service area were developed based on historic and anticipated population growth trends, historic per capita water use patterns, and water use patterns for other local water systems. Population projections were developed based on the Town of Holly Springs 1998 Ten-Year Comprehensive Growth Plan (Growth Plan), the Town's Urban Services Area, and the planned Future Service Area at buildout. The Town has not officially developed a buildout population estimate.

For purposes of long range water supply planning and this Application, buildout population was estimated based on the expected Future Service Area at buildout. This area is shown in the attached map and is defined by the following:

- Service area boundary between the Towns of Holly Springs and Apex
- Service area boundary between the Towns of Holly Springs and Fuquay-Varina
- Expected service area boundary between the Towns of Holly Springs and Cary
- The Harris Plant area to the west of Holly Springs (owned by CP&L)
- Harnett County

The Town of Holly Springs has service area boundary agreements with the Towns of Apex and Fuquay-Varina. A service area boundary agreement is currently being negotiated with the Town of Cary. Much of the area around the Shearon Harris Nuclear Power Plant cannot be developed. However, Carolina Power and Light (CP&L) owns some property in this area that may be suitable for development. Therefore, the total Future Service Area is expected to cover approximately 34,400 acres (54 sq. mi.) not including the undevelopable land in the Harris Plant Area. The Future Service Area is delineated on the map attached to this application.

Buildout population was estimated based on planned land uses presented in the Town's Growth Plan and an expected persons per household factor of 2.5 taken from the Transportation Analysis Zone data of the Capital Area Metropolitan Planning Organization (CAMPO). The study area for the Growth Plan was the area that was expected to reach buildout within 10 years and encompassed only 36 sq. mi. The ratio of land uses in the Growth Plan was applied to the total acreage encompassed by the expected Future Service Area at buildout to estimate the Town's buildout population. Based on this methodology, the total buildout population for the Town of Holly Springs is approximately 124,000 (Table 1-1).

TABLE 1-1
Planned Buildout Population for Town of Holly Springs
Jordan Lake Water Supply Storage Allocation Application

Class	Acreage[1]	Housing Units per Acre[2]	Persons per Housing Unit[3]	Population
High Density Residential	2,404	5-10	2.5	21,036
Moderate Density Residential	11,875	2-5	2.5	72,734
Low Density Residential	8,020	≤2	2.5	14,035
Rural Preservation Area	2,491	≤3	2.5	6,539
Commercial	1,040	0	0	0
Industrial	1,674	0	0	0
CP&L Property	5,798	≤2	2.5	10,146
Public Open Space	304	0	0	0
Wake County Property	803	0	0	0
TOTAL	34,409			124,489
Population Density (people per sq. mi.)				2,315

1. Based on expected Future Service Area at buildout assuming that 70 percent of the total acreage is developable to account for streams, buffers, roads or other property not suitable for development.
2. Housing density from Town of Holly Springs 1998 Ten-Year Comprehensive Growth Plan
3. Projected persons per housing unit from CAMPO Transportation Analysis Zone data

This buildout population results in a planned density of 2,315 persons per square mile at buildout. This density is similar to the planned population densities for other local municipalities, particularly Cary and Apex (Table 1-2). Raleigh has a higher population density currently, and Morrisville is planning for a density of 2,784 at buildout.

TABLE 1-2
Planned Population Densities for Municipalities in Wake County
Jordan Lake Water Supply Storage Allocation Application

Municipality	Current Population Density (persons per square mile)	Planned Population Density (persons per square mile)
Cary	2,238	2,141
Apex	2,124	2,226
Morrisville	882	2,784
Raleigh	2,445	N/A

Source: Planning Departments for Cary, Apex, Morrisville, and Raleigh

Water demand forecasts were developed for the following water use sectors and the methodology for projecting water use for each sector is presented in Section 1.2:

- Residential
- Commercial
- Industrial
- Institutional
- Process Water
- Unaccounted-for Water

1.2 Water Use Sectors

1.2.1 Residential

Residential water demand forecasts were developed based on projections of population and historical usage per capita. The residential per capita water use has fluctuated between 66 and 77 gallons per day per capita (gpcd) (Table 1-3). The Town of Holly Springs experienced rapid growth during the 1990's. Many of these new homes are larger and have a higher value than homes constructed prior to 1990. Typically, homes of higher value have higher water use, particularly for irrigation of landscaping. Some water conservation measures have already been implemented by the Town of Holly Springs as shown by the lower per capita demand of 66 gpcd in 1999 when the Town imposed water restrictions due to drought conditions. Since new development will account for a higher proportion of the water use in the future, with buildout population projected to be over 12 times higher than current service area population, a per capita water use of 75 gpcd was selected for forecasting residential water demands.

TABLE 1-3
Historical Residential Water Use in the Town of Holly Springs
Jordan Lake Water Supply Storage Allocation Application

Year	Residential Water Use[1] (mgd)	Population[2]	Per Capita Residential Demand gpcd)
1995	0.232	3,030	77
1997	0.417	5,492	76
1999	0.507	7,686	66
	Average		73

1. from Town of Holly Springs Engineering Department
2. Office of State Planning population estimates

1.2.2 Commercial

The commercial use sector includes water use by businesses, including retail, service, offices, golf courses, health care facilities, hotels, restaurants, commercial irrigation and car washes. Growth in the commercial sector is closely linked with population growth since

new residents within the Town are the economic driver for additional commercial goods and services. Historical use for the commercial sector in the Town of Holly Springs is shown in Table 1-4. Commercial per capita water usage in Holly Springs has increased from 3.1 to 4.6. These per capita water demands are low compared to commercial water use in other communities, mainly because Holly Springs has been a bedroom community. Commercial development in Holly Springs consists of a few businesses with low water usage. However, the Town is planning for and attracting businesses and retail stores such as restaurants, department stores, home improvement warehouses, and grocery stores. Given the rapid population growth in the 1990's, commercial development is expected to increase in the near future to serve this new population base. Therefore, commercial water use is expected to increase and should account for a higher percentage of the Town's water use similar to other communities. A per capita demand of 10 gpcd was used for forecasting water demands in the commercial sector, which results in a non-residential per capita demand similar to that of the Towns of Apex and Cary but slightly lower than in the City of Durham, which serves a portion of Research Triangle Park.

Historical employment data is not available for comparison of unit water use per employee for the commercial or industrial sectors. Town of Holly Springs staff have indicated that employment projections found in CAMPO's TAZ data may not reflect the Town's land use planning and were therefore not used for forecasting growth and development of the commercial and industrial sectors.

TABLE 1-4

Historical Commercial Water Usage - Town of Holly Springs
Jordan Lake Water Supply Storage Allocation Application

Year	Commercial Water Use[1] (mgd)	Population[2]	Per Capita Commercial Demand (gpcd)	Number of Commercial Accounts[1]	Water Use per Account (gpd)
1995	0.011	3,500	3.1	29	379
1997	0.017	5,492	3.1	54	315
1999	0.035	7,686	4.6	94	372

3. from Town of Holly Springs Engineering Department
4. Office of State Planning population estimates

1.2.3 Industrial

The industrial sector includes processing, manufacturing, and warehousing companies. The Town has historically attracted small industries with 150 employess or less. However, accurate historical employment data is not available for the Town of Holly Springs. Town of Holly Springs staff have indicated that employment projections found in CAMPO's TAZ data may not reflect the Town's land use planning and were therefore not used for forecasting growth and development of the commercial and industrial sectors.

As shown in Table 1-5, industrial water usage in Holly Springs has increased from over 2.80 MG to 4.52 MG in recent years although the per capita water use decreased. Part of the

reason for the lower per capita use in 1999 may be due to severe water use restrictions initiated by Cary and Apex and the fact that the rapid population growth during the 1990's was not accompanied by similar growth in the industrial sector. Over 8,600 people moved to Holly Springs during the 1990's, representing a 800% increase in population. The industrial sector did not grow at a similar rate although the Town is planning for additional light industrial development. According to the Town's Growth Plan and plans for the West Holly Sprigs Business Center, , there are 1,674 acres planned for industrial use, which is approximately the same area as the portion of RTP within Wake County.

TABLE 1-5
Historical Industrial Water Usage –Town of Holly Springs
Jordan Lake Water Supply Storage Allocation Application

Year	Industrial Water Use (MG)	Industrial Accounts	Usage per Account (gpd)
FY 1996	2.80	12	639
1999	4.52	12	1,032

Source: Town of Holly Springs Engineering Department

Projections of water use for the industrial sector were developed based on the estimated buildout gross square footage (GSF) of industrial facilities and the typical unit water use for light industries. This methodology is similar to that used in the *Water and Sewer Facilities Planning Study* (CH2M HILL, 2000) completed for the Research Triangle Foundation and Wake County for the Wake County portion of Research Triangle Park.

For RTP, the buildout GSF was estimated based on zoning standards, which require that the floor/area ratio not exceed 0.15 in Durham County and the total impervious surface not exceed 30% in Wake County. Assuming a floor/area ratio of 0.15 in the industrial areas in Holly Springs, the buildout GSF is estimated at 10.9 million GSF.

For RTP, historical water use records were obtained from the Town of Cary and the City of Durham. Unit water use in gallons per day (gpd) per 1,000 GSF of building space was calculated for each industry in RTP. The unit water use values varied widely, ranging from 9 to 971 gpd per 1,000 sf. In 1999, the weighted average unit water use was 288.5 gpd per 1,000 GSF, excluding high water-consuming industries such as biotechnology companies. Since the Town of Holly Springs is planning to attract low water consuming industries, a unit water use of 290 gpd per 1,000 GSF was used to forecast demands in the industrial sector. Based on building space of 10.9 million GSF at buildout, the projected water demand for the industrial sector in Holly Springs would be approximately 3.1 mgd. Since the population within Holly Springs is expected to reach buildout by 2045, industrial growth and development was projected to increase linearly from current levels to buildout by 2045 (Table 1-6).

TABLE 1-6
Projected Growth in Industrial Sector for the Town of Holly Springs
Jordan Lake Water Supply Storage Allocation Application

Year	Projected GSF of Industrial Facilities
2000	208,950
2005	1,401,289
2010	2,593,628
2015	3,785,967
2020	4,978,306
2025	6,170,644
2030	7,362,983
2035	8,555,322
2040	9,747,661
2045	10,940,000
2050	10,940,000

1.2.4 Institutional

The institutional sector category consists of educational and municipal uses, including schools, churches, water main flushing, and other internal uses by the Town of Holly Springs. Institutional water usage in Holly Springs has increased from 60,000 gpd in 1995 to 10,000 gpd in 1999 (Table 1-7). A relationship was observed between institutional and residential water demands. The percentage of institutional water use to residential water use averaged 2.0% over the period.

Schools and municipal facilities are expected to constitute the majority of the institutional demand in Holly Springs since large institutional users such as federal laboratories (U.S. Environmental Protection Agency and National Institute for Environmental Health Sciences) and universities are not currently planned for the Town. Therefore, institutional demands were projected assuming the historical relationship between institutional demands and residential demands would continue.

TABLE 1-7
Historical Industrial Water Usage -Town of Holly Springs
Jordan Lake Water Supply Storage Allocation Application

Year	Number of Institutional Accounts	Institutional Water Use (mgd)	Usage per Account (gpd)	Institutional Water Use as Percent of Residential
1995	14	0.006	429	2.6%
1997	16	0.006	375	1.4%
1999	17	0.010	588	2.0%
		Average		2.0%

Source: Town of Holly Springs Engineering Department

1.2.5 Process Water

The Town of Holly Springs is planning to access their Jordan Lake water supply allocations either through their own water treatment facility or through the Harnett County Regional Water Treatment Plant. A portion of the raw water withdrawn by the Town of Holly Springs would be used during the water treatment process for filter backwashing or would be lost in treatment residuals. At the Harnett County Regional Water Treatment Plant, the average amount of water lost to treatment processes is approximately 4 percent. If Holly Springs accesses their Jordan Lake Allocation through the Harnett County plant, then process water would account for 4 percent of the total raw water withdrawn. However, process water use by other water treatment facilities in the region is typically higher than 4 percent. Process water use at local water treatment facilities is summarized below:

- Cary/Apex WTP = 9 percent
- City of Durham WTPs = 8 percent
- Jones Ferry Road WTP (OWASA) = 6 percent

If the Town of Holly Springs were to construct its own water treatment plant, then process water use could be in the range of 4 to 9 percent. Process water use of 6 percent was used in water demand forecasts since this value is an average of the process water use for local water treatment facilities and is a more conservative estimate appropriate for water supply planning.

1.2.6 Unaccounted-For Water

Unaccounted-for water in the Holly Springs water system was 13.5% in 1997. No other historical data is available to determine unaccounted-for water in the Holly Springs water system. Therefore, 10 percent was used for unaccounted-for water in the demand forecasts presented in this Application.

1.2.7 Summary of Per Capita Demands

Table 1-8 summarizes the use factors and methodology used to forecast water demands for the Town of Holly Springs water system.

TABLE 1-8
Population and Account Growth Forecasts
Jordan Lake Water Supply Storage Allocation Application

Water Use Sector	Basis for Demand Forecasts
Residential	75 gpcd
Commercial	10 gpcd
Industrial	290 gpd per 1,000 GSF
Institutional	2% of residential demand
Process Water	6% of Subtotal Demand
Unaccounted-For Water	10% of Subtotal Demand

1.3 Population Projections

Historic population data shows that Holly Springs has increased in population from a community of 558 in 1960 to a population of 9,192 in 2000. The population in Holly Springs increased approximately 800% during the 1990's. As of 2000, the Town of Holly Springs had the fastest growth of any municipality in Wake County. A primary driver for the growth of western Wake County has been development linked to the Research Triangle Park, which brought an influx of technical and business professionals to the area.

The buildout population of Holly Springs was estimated at 125,000 based on the expected Future Service Area (Section 1.1). Population projections were developed by examining the projected growth rates for the Town of Apex since Apex is experiencing similar growth as the Town of Holly Springs. The population of Apex is currently 22,453 people, a 1500% increase over its 1990 population of 1,368. Table 1-9 summarizes the population projections developed for this Application. The service area population is expected to increase from 9,192 in 2000 to 125,000 in 2045. This represents an increase of approximately 1260% in the service area population, and an average annual rate of increase of about 2.8% per year.

TABLE 1-9
Projected Population for the Town of Holly Springs
Jordan Lake Water Supply Storage Allocation Application

Year	Projected Service Area Population	Annual Growth Rate[1]
2000	9,200	43.7%
2005	21,500	17.0%
2010	37,275	11.0%
2015	54,235	7.5%
2020	71,400	5.5%
2025	87,210	4.0%
2030	103,900	3.5%
2035	114,815	2.0%
2040	122,220	1.3%
2045	125,000	0.5%
2050	125,000	0.0%

1. Growth represents average annual growth rate for preceding 5-year period. Growth rate for year 2000 represents annual growth rate for 1995-2000 period.

1.4 Water Demand Forecasts

Average day water demand forecasts are based upon the population projections and the per capita use factors presented in this section and are summarized in Table 1-10. Average day water demands for the Holly Springs service area are expected to increase from 1.0 mgd in 2000 to 16.1 mgd in 2050. Demand forecasts as well as other information on water use are included in the Local Water Supply Plan (Attachment 1).

TABLE 1-10
Projected Average Daily Water Demand – Holly Springs Service Area[1]
Jordan Lake Water Supply Storage Allocation Application

	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential	0.69	1.61	2.80	4.07	5.36	6.54	7.79	8.61	9.17	9.38	9.38
Commercial	0.09	0.22	0.37	0.54	0.71	0.87	1.04	1.15	1.22	1.25	1.25
Industrial	0.06	0.39	0.73	1.06	1.39	1.73	2.06	2.40	2.73	3.06	3.06
Institutional	0.01	0.03	0.06	0.08	0.11	0.13	0.16	0.17	0.18	0.19	0.19
Process Water (6%)	0.05	0.14	0.24	0.35	0.45	0.56	0.66	0.74	0.80	0.83	0.83
Unaccounted-For Water (10%)	0.09	0.23	0.40	0.58	0.76	0.93	1.10	1.23	1.33	1.39	1.39
Total Service Area Demand	0.99	2.61	4.58	6.67	8.78	10.76	12.82	14.30	15.43	16.10	16.10

1. All data in million gallons per day (mgd)

2. Conservation and Demand Management

The Town of Holly Springs is committed to water conservation to reduce water demands and to increase the efficient utilization and protection of existing natural resources. The Town has a *Water Shortage and Conservation Ordinance* (Attachment 2), which became effective July 21, 1998, and has developed a *Water Shortage Response Plan* (CH2M HILL, May 1999). The Town was also the first municipality in Wake County to impose mandatory water conservation measures. The Town has not yet adopted quantifiable long-range voluntary conservation goals. However, Holly Springs is focused on water conservation through the following efforts:

1) Education
    a) Articles in *The Springs* newsletter
    b) Brochures with questions and answers regarding conservation
    c) Water bill inserts with conservation reminders
    d) Education for students at local schools
2) Notification
    a) Newspaper advertisement
    b) Signage
    c) Hand-delivered notices
3) Water conservation policies
    a) ordinance requires meters on irrigation systems
4) Enforcement of water conservation ordinance
5) Rate structure
    a) The Town has converted to an increasing block rate structure
    b) Higher water rates for irrigation use

The Town intends to conduct the following to achieve additional opportunities for water conservation and reuse:

- Incorporate reuse facilities into Utley Creek WWTP
- Develop a long-range water supply plan
- Conduct water distribution modeling study
- Explore opportunities for water reuse with new developments

- Install a new SCADA system to allow for more efficient tracking of water use in the system and identify potential problem areas.
- Replace existing water meters with electronic meters to increase the accuracy of water use measurement.

The Town of Holly Springs has also been proactive in pursuing opportunities for water reclamation and reuse. The Town is currently planning for the following water reuse projects:

1) Finisterra golf course
2) Finisterra subdivision (dual distribution system is planned)
3) Athletic fields at Holly Ridge Elementary and Middle Schools
4) Parrish Womble Park
5) Another park planned near Holly Springs Elementary School

The Town is also exploring interest in water reuse with the Devil's Ridge golf course as well as industrial customers. Infrastructure is currently being planned to convey reclaimed water to many of the potential users listed above. In addition, the Town has abandoned force mains throughout the service area that could be converted for use in the reclaimed water system. Although no detailed evaluations have been completed, reuse demand is estimated to reach or exceed 1.0 mgd by 2010.

The Town has not adopted quantifiable conservation goals. However, the Town has been proactive in water conservation through education, development and enforcement of water conservation policies, and implementation of an increasing block rate structure. Therefore, it was assumed that conservation would reduce projected water demand in Holly Springs by 5% by 2050 for purposes of this application. The final water demands in Table 2-1 and the attached Local Water Supply Plan are based on a 5% reduction in demand.

Based on guidance from DWR, water reuse is included as a source in the water supply alternatives in Section 5. Together, water conservation and reuse are expected to reduce potable water demands by over 9% by 2050.

TABLE 2-1
Projected Water Demands and Impact of Water Conservation for the Town of Holly Springs
Jordan Lake Water Supply Storage Allocation Application

Year	Projected Water Demands	Projected Water Demands (including conservation)
2000	0.99	0.94
2005	2.61	2.48
2010	4.58	4.35
2015	6.67	6.34
2020	8.78	8.34
2025	10.76	10.22
2030	12.82	12.18
2035	14.30	13.58
2040	15.43	14.66
2045	16.10	15.29
2050	16.10	15.29

3. Current Water Supply

The current water supply sources for the Town of Holly Springs are summarized in Table 3-1. The Town currently meets water demands by purchasing finished water from the City of Raleigh, which uses Falls Lake as its water supply. The contract amount with the City of Raleigh is 1.2 mgd on a maximum day basis. The Town also purchased 2-mgd of capacity in Harnett County Regional WTP as well as 9.6 mgd of capacity in a 36-inch transmission main from Harnett County to Holly Springs. This contract is in effect beyond 2035. The Town of Holly Springs has also discussed purchasing an additional 1 mgd of capacity in the Harnett County Regional WTP.

The Town was granted a 2.0-mgd allocation from the Jordan Lake water supply pool during the Round 2 allocation process. The Town is evaluating an alternative to construct a new water treatment facility with an intake on the Cape Fear River.

TABLE 3-1
Current Water Supply Sources for the Town of Holly Springs
Jordan Lake Water Supply Storage Allocation Application

Source	County	Basin	Source Type	Safe Yield (50-year)	Water Quality
City of Raleigh	Wake	Neuse	purchase	1.2[1]	good
Harnett County	Harnett	Cape Fear	purchase	2.0[2]	good
Jordan Lake	Chatham	Cape Fear	surface	2.0[3]	good

1. Maximum day contract amount (expires June 2017)
2. Maximum day contract amount (expires 2037)
3. Existing allocation from Jordan Lake water supply pool

4. Future Water Supply Needs

Based on the water demand forecasts presented in Section 1 and the existing water supplies, future water supply needs for the Town of Holly Springs service area are summarized in Table 4-1. Due to rapid growth within its service area, water demands are projected to increase to 15.3 mgd by 2045 when buildout is reached. Although the Town has evaluated several water supply options in a recent study, no projects have been completed or permitted.

The Town of Holly Springs has a 2.0-mgd allocation from the Jordan Lake water supply pool. To access this water supply, the Town will need to construct a new water treatment facility, potentially in cooperation with other local water systems, or purchase additional treatment capacity from the Harnett County Regional WTP. Without access to its Jordan Lake allocation, the Town has limited water supply and will experience a supply deficit by 2010. Even with the 2.0-mgd allocation, the Town will experience a water supply deficit by 2015.

The Town is projected to require approximately 10.2 mgd of additional water supply through 2030 in order to maintain water demands at less than 80 percent of water supply capacity. By 2050, an additional 6.0 mgd of water supply will be needed. These water supply needs assume that current purchase contracts with the City of Raleigh and Harnett County will not be extended beyond the contract period.

TABLE 4-1
Future Water Supply Needs

	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Available Supply											
(1) Existing Surface Water Supply	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
(2) Existing Ground Water Supply	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(3) Existing Purchase Contracts	3.2	3.2	3.2	3.2	2.0	2.0	2.0	2.0	0.0	0.0	0.0
(4) Future Supplies (Water Reuse)	0.0	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
(5) Total Available Supply	5.2	5.7	6.2	6.2	5.0	5.0	5.0	5.0	3.0	3.0	3.0
Average Daily Demand											
(6) Service Area Demand[1]	0.99	2.48	4.35	6.34	8.34	10.22	12.18	13.58	14.66	15.29	15.29
(7) Existing Sales Contracts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(8) Future Sales Contracts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(9) Total Average Daily Demand	0.99	2.48	4.35	6.34	8.34	10.22	12.18	13.58	14.66	15.29	15.29
(10) Demand as Percent of Supply	19%	44%	70%	102%	167%	204%	244%	272%	489%	510%	510%
(11) Supply Needed to maintain 80%	1.2	3.1	5.4	7.9	10.4	12.8	15.2	17.0	18.3	19.1	19.1
Additional Information for Jordan Lake Allocation											
(12) Sales Under Existing Contracts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(13) Expected Sales Under Future Contracts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(14) Demand in each planning period	0.99	2.48	4.35	6.34	8.34	10.22	12.18	13.58	14.66	15.29	15.29
(15) Supply minus Demand	4.21	3.22	1.85	-0.14	-3.34	-5.22	-7.18	-8.58	-11.66	-12.29	-12.29

1. Includes anticipated demand reduction through water conservation.

5. Alternative Water Supplies

The Town of Holly Springs has considered several alternatives to meet its long-term water supply needs to 2050 and to support projected growth in the service area. Some of these water supply sources were evaluated in the *Preliminary Engineering Report: Water Supply Improvements for the Town of Holly Springs, NC* (The Wooten Company, 1999). To the extent possible, all water supply alternatives were developed such that the water demands do not exceed 80% of the available supply. The water supply alternatives are summarized below:

Water Supply Alternative	Description
1	a) Obtain 16-mgd allocation from Jordan Lake water supply pool b) Construct raw water intake and treatment plant on Cape Fear River c) Water reuse program
2	a) Obtain 16-mgd allocation from Jordan Lake water supply pool b) Purchase capacity in Harnett County Regional WTP c) Water reuse program
3	a) Negotiate Long-term Purchase Contract with City of Raleigh b) Water reuse program
4	a) Participate in development of regional water supply b) Water reuse program

Each water supply alternative was evaluated using the criteria listed below:

- Environmental impacts (compared to the Jordan Lake alternative)
- Water quality classification
- Timeliness of implementation
- Interbasin transfers
- Potential for regional partnerships
- Technical complexity
- Institutional complexity
- Political complexity
- Public benefits such as recreation
- Consistency with local plans
- Capital and Operation/Maintenance Cost

A summary of the results of the evaluation of each water supply alternative is shown in Table 5-1. Each alternative is discussed in further detail in the following sections. Alternatives 3 and 4 would require interbasin (IBT) certificates since these alternatives represent an increase over the grandfathered IBT amount. Cost estimates for each alternative do not include the costs for implementation of water reuse and reclamation nor the costs for purchase of 2 mgd from Harnett County since these projects are included in each water supply alternative.

TABLE 5-1
Summary of Water Supply Alternatives

	Alternatives			
	1	**2**	**3**	**4**
Additional Supply (mgd)	16.0	16.0	16.0	16.0
Environmental Impacts	same	same	worse	worse
Water Quality Classification	WS-IV CA	WS-IV CA	WS-V	WS-IV
Interbasin Transfer (mgd)	1.8[1]	1.8[1]	17.3[2]	17.3[2]
Regional Partnerships	yes	yes	yes	yes
Technical Complexity	Complex	Not Complex	Not Complex	Very Complex
Institutional Complexity	Complex	Complex	Very Complex	Very Complex
Political Complexity	Not Complex	Complex	Complex	Complex
Public Benefits	none	none	none	few
Consistency with Local Plans	yes	yes	yes	no
Net Present Value ($ Millions)	$77.8	$107.6	$123.8 (a) $156.9 (b)	$234.5 (a) $261.0 (b)
Unit Cost ($/1000 gallons)	$4.86	$6.73	$7.74 (a) $9.81 (b)	$14.66 (a) $16.31 (b)

1. *Maximum day IBT from the Cape Fear subbasin to the Neuse River subbasin (2050).*
2. *Maximum day IBT from the Neuse River subbasin to the Cape Fear subbasin (2050).*

5.1 Alternative 1 – Obtain 16-mgd Jordan Lake Allocation and Construct New Intake and Treatment Facility on Cape Fear River.

The Town of Holly Springs would secure a 10.0-mgd Level I and an 6.0-mgd Level II water supply allocation for Jordan Lake to provide water supply needs through 2050. This alternative would increase total water supply capacity to approximately 19.0 mgd, including existing water supplies and a water reuse program. The new raw water intake and treatment facility would be constructed on the Cape Fear River upstream of Buckhorn Dam. The Town could potentially construct the intake and treatment facility in partnership with other local water systems in southern and western Wake County.

The intake and treatment facility could be online by 2007 if an allocation is granted in 2001. Maximum day water demands may be approaching the Town's available water supplies by 2005. The Town may need to secure additional water supply to meet maximum day demands until new WTP is online. An Environmental Assessment for the Cape Fear WTP is expected to be complete by Fall 2001.

This alternative does not increase the Town's IBT since all wastewater would be returned to the Cape Fear River basin through the Utley Creek WWTP and a new regional Cape Fear WWTP that would discharge to the Cape Fear River below Buckhorn Dam.

	Comments
Available Supply	16 mgd
Environmental Impacts	No adverse impacts on environment anticipated.
Water Quality Classification	WS IV CA
Timeliness	Intake and WTP design and construction by 2007. Regional Cape Fear WWTP is planned for implementation by 2010.
Interbasin Transfer	No increase in IBT with corresponding expansion of Utley Creek WWTP or construction of Regional Cape Fear WWTP.
Regional Partnerships	May require increased purchases from Raleigh and/or Harnett County to meet interim maximum day demands. Other utilities could potentially participate in new intake and WTP.
Technical Complexity	Requires design and construction of new intake and treatment facility as well as finished water transmissions facilities from intake to service area
Institutional Complexity	Requires completion of DWR Jordan Lake allocation process. Completion of EA for new intake and WTP.
Political Complexity	Complex
Public Benefit	None
Consistency w/ Local Plans	Yes
Cost	$77.8 million (NPV) for intake, WTP, and FW transmission. Assumes intake on Cape Fear River near Hwy 42 with WTP located near Wake-Harnett county line.

5.2 Alternative 2 – Obtain 16-mgd Jordan Lake Allocation and Purchase Capacity in Harnett County Regional WTP.

The Town of Holly Springs would secure a 10.0-mgd Level I and an 6.0-mgd Level II water supply allocation for Jordan Lake to provide water supply needs through 2050. This alternative would increase total water supply capacity to approximately 19.0 mgd, including existing water supplies and a water reuse program

The Town would purchase capacity in the Harnett County Regional WTP to access the Jordan Lake allocation from the Cape Fear River. The plant currently has a capacity of 12 mgd, and Harnett County has initiated a pilot-testing program to re-rate the plant's capacity to 18 mgd and the Cape Fear River intake is permitted for a withdrawal of 12 mgd. Harnett County has indicated that the plant site has a buildout capacity of 48 mgd. The Town of Holly Springs currently owns 2 mgd of capacity and would need to purchase an additional 16 mgd of plant capacity to meet demands through 2050. The Town would exceed the reserved capacity in the 36-inch finished water pipeline from the Harnett County Regional WTP to Holly Springs and would need to construct a parallel line in the 2015 timeframe to convey maximum day finished water demands.

This option would be implemented as a form of indirect reuse, increasing the water available for withdrawal at the Harnett County WTP through an equivalent quantity of discharges to the Cape Fear River basin from the Town's Utley Creek WWTP and a regional Cape Fear River WWTP. There is no net interbasin transfer for this arrangement.

	Comments
Additional Supply	16 mgd
Environmental Impacts	No adverse impacts on environment anticipated.
Water Quality Classification	WS IV CA
Timeliness	Harnett County Regional WTP expansion to 24-mgd by 2003. Cape Fear WWTP by 2010.
Interbasin Transfer	No increase in IBT with corresponding expansion of Utley Creek WWTP and construction of regional Cape Fear River WWTP.
Regional Partnerships	Coordination with Harnett County for the purchase of capacity in the Harnett County Regional WTP.
Technical Complexity	This alternative may buildout the site for the Harnett County Regional WTP.
Institutional Complexity	Requires completion of DWR Jordan Lake allocation process.
Political Complexity	Complex
Public Benefit	None
Consistency w/ Local Plans	Yes
Cost	$107.6 million (NPV) for purchase of capacity in Harnett County Regional WTP, monthly consumption charges, and construction of parallel transmission main

5.3 Alternative 3 – Purchase Finished Water from City of Raleigh

In this alternative the Town would negotiate a long-term contract to purchase an additional 16-mgd from the City of Raleigh. This option assumes that the Town could access its existing 2-mgd Jordan Lake allocation through the Harnett County Regional WTP.

The City of Raleigh currently relies on Falls Lake, which has a 50-year safe yield of 72 mgd, as its raw water source. Raw water from Falls Lake is treated at the E.M. Johnson WTP with a capacity of 78 mgd. The City is also planning to construct an intake and treatment facility at Lake Benson. The Lake Benson has a safe yield of approximately 17 mgd. Due to growth in the City of Raleigh and in the communities that Raleigh serves, the City may not have sufficient water supply capacity to supply Holly Springs with a 16 mgd of finished water through 2050. However, Raleigh is evaluating the feasibility of additional water supplies such as Kerr Lake. Other regional water supplies in Wake County such as new reservoirs on Middle Creek and Little River are also being evaluated, but these supplies are expected to require at least 15 to 20 years to implement.

This option would increase the interbasin transfer from the Neuse River Basin to the Cape Fear River Basin and would require an IBT certificate from the EMC.

	Comments
Available Supply	Uncertain
Environmental Impacts	Water withdrawal from Neuse River basin may have impact upon downstream water quality, especially with regard to nitrogen loading allocations.
Water Quality Classification	WS-V
Timeliness	Preliminary design for the Dempsey Benton WTP is underway. Kerr Lake, Middle Creek Reservoir, and Little River Reservoir may require 15 to 20 years for implementation. This may result in supply deficit in 2015 to 2030.
Interbasin Transfer	This option would increase interbasin transfer from Neuse River Basin to Cape Fear River Basin. Some options such as Kerr Lake also represent an IBT.
Regional Partnerships	Would require long-term contract with the City of Raleigh. Increased withdrawals from the Neuse River Basin may reduce the yield available to downstream utilities. Coordination with downstream users may be necessary to develop regional water supply approach for Neuse River.
Technical Complexity	An additional finished water main may be required to supply up the 16 mgd from the City of Raleigh. Facilities to expand Raleigh's water supply may be complex and costly.
Institutional Complexity	IBT certificate would be required. Permitting and environmental review for Raleigh's water supply projects expected to be time-consuming and costly.
Political Complexity	Very complex
Public Benefit	Few
Consistency with Local Plans	No
Cost	$123.8 million (NPV) for option A. NPV increases to $156.9 million accounting for facilities to return wastewater to Neuse basin (Option B).

5.4 Alternative 4 - Participate in Development of Regional Water Supply

The Town of Holly Springs could participate in a regional water supply project to meet its long-range water supply needs. In Wake County, new reservoirs on Middle Creek and Little River are being evaluated. Several water systems in the Triangle area are also evaluating Kerr Lake as a potential future water supply source. For purposes of this application, information is provided for Middle Creek.

Middle Creek is a tributary of the Neuse River in southern Wake County. This option would develop a new Middle Creek reservoir as a joint venture with local governments in Wake County and Johnston County. To meet the Town's water supply needs, the Town would require a 45 percent share in the safe yield from the new reservoir based on USGS estimates of the available safe yield in Middle Creek.

This option would include construction of a new dam, spillway and intake facilities; relocation of existing roads and bridges; and construction of transmission facilities to convey finished water approximately 30 miles from the intake to the Holly Springs service area.

The Town would need to obtain additional water supply from other sources temporarily to meet water demands since any regional water supply project would require at least 15 to 20 years to develop.

	Comments
Available Supply	Total = 35 mgd, Town's share = 16 mgd.
Environmental Impacts	Potential impacts to existing wetlands and uplands from submergence. Water withdrawal from Neuse River may have impact upon downstream water quality, especially with regard to nitrogen loading allocations.
Water Quality Classification	C NSW
Timeliness	Uncertain; 15 to 20 years to develop any regional water supply project
Interbasin Transfer	The Town would need to relocate wastewater discharges to the Neuse River Basin in order to reduce interbasin transfer.
Regional Partnerships	Increased withdrawals from the Neuse River Basin may reduce the yield available to downstream utilities. Coordination with Smithfield/Johnston County, Goldsboro, Kinston and others may be necessary to develop regional water supply approach for Neuse River.
Technical Complexity	Construction of dam, reservoir, intake and transmission pipeline present significant engineering challenges; existing roads and bridges will have to be modified or relocated
Institutional Complexity	Subject to SEPA process; EIS for new reservoir and intake facilities. The EIS would include an evaluation on river water quality.
Political Complexity	Very complex
Public Benefit	Few
Consistency with Local Plans	No
Cost	$234.5 million (NPV) for option A. NPV increases to $261.0 million accounting for facilities to return wastewater to Neuse basin (Option B).

6. Plans to Use Jordan Lake

6.1 Allocation Request

The Town of Holly Springs is applying for a **10.0-mgd Level I** and **6.0-mgd Level II** allocation from the Jordan Lake water supply pool. This will increase the Town's total water supply allocation to 18 mgd. Jordan Lake represents the most cost-effective and environmentally sustainable option for expanding the water supply capacity of Holly Springs. All other alternatives increase the interbasin transfer from the Neuse River Basin to the Cape Fear River Basin, which increases project costs and schedule due to the IBT certification process and increases the environmental impacts, or represent a much higher unit cost.

6.2 Water Quality Monitoring Plan

The proposed monitoring program for raw water withdrawn from the Cape Fear River and finished water from either the Harnett County Regional WTP or a new water treatment facility with an intake on the Cape Fear River is summarized below in Tables 6-1 and 6-2. Table 6-1 summarizes the monitoring program for the finished water and Table 6-2 summarizes the monitoring program for the raw water. The monitoring program is based on current regulations of the North Carolina Rules Governing Public Water Supplies and the U.S. Environmental Protection Agency. The proposed monitoring program includes monitoring required by state and federal regulations as well as additional monitoring to provide more information about water quality in the Cape Fear River and improve operation and performance of the treatment facility.

TABLE 6-1
Proposed Finished Water Monitoring Program for Jordan Lake Facilities

Contaminant	Monitoring Frequency	Sample Location
MICROBIOLOGY AND TURBIDITY		
Total coliforms	based on population	DS
Turbidity	Continuously	FW
Turbidity	Daily	RW
CORROSITIVITY		
Alkalinity	Daily	RW and FW
Calcium	Monthly	FW
Total dissolved solids	Weekly	FW
Temperature	Daily	RW and FW

TABLE 6-1
Proposed Finished Water Monitoring Program for Jordan Lake Facilities

PH		Daily	RW and FW
INORGANIC			
Iron		Daily	RW and FW
Manganese		Daily	RW and FW
Fluoride		Daily	FW
Nitrate (as Nitrogen)		Monthly	RW and FW
Nitrite		Monthly	RW and FW
Orthophosphate		Daily	FW
Total Phosphorus		Monthly	RW
Aluminum	Mercury		
Antimony	Molybdenum		
Arsenic	Nickel		
Asbestos	Selenium		
Barium	Silver		
Beryllium	Sodium	Annually	RW and FW
Cadmium	Sulfate		
Chromium	Thallium		
Copper	Vanadium		
Cyanide	Zinc		
Lead			
TRIHALOMETHANES/HALOACETIC ACIDS			
Chloroform	Bromodichloromethane		
Bromoform	Chlorodibromomethane		
Monochloroacetic acid	Trichloroacetic acid	Quarterly	FW and DS
Monobromoacetic acid	Dibromoacetic acid		
Dichloroacetic acid	Bromochloroacetic acid		
VOLATILE ORGANIC COMPOUNDS			
Benzene	1,1-Dichloroethylene	First Year: 4/year	FW
Carbon tetrachloride	Ethylbenzene	Subsequent Years:	
Chlorobenzene	Tetrachloroethylene	Annually	
1,2-Dichlorobenzene	1,1,1-Trichloroethane		

TABLE 6-1
Proposed Finished Water Monitoring Program for Jordan Lake Facilities

1,4-Dichlorobenzene	Trichloroethylene		
1,2-Dichloroethane	1,2,4-Trichlorobenzene		
cis-1,2-Dichloroethylene	Vinyl chloride		
trans-1,2-Dichloroethylene			
ORGANIC COMPOUNDS			
1,1,2-Trichloroethane	Ethylene dibromide (EDB)		
1,2-Dichloropropane	Glyphosate		
2,3,7,8-TCDD (Dioxin)	Heptachlor		
2,4,5-TP	Heptachlor epoxide		
2,4-D	Hexachlorobenzene		
Adipates	Hexachlorocyclopentadiene		
Alachlor	Lindane		
Atrazine	Methoxchlor	First Year: 4/year	
Benzo(a)pyrene	Oxamyl (vydate)	Subsequent years:	FW
Carbofuran	PAHs	Quarterly at 3-yr intervals	
Chlordane	PCBs		
Dalapon	Phthalates		
Dibromochloropropane (DBCP)	Picloram		
Dichloromethane	Simazine		
Dinoseb	Styrene		
Diquat	Toluene		
Endothall	Toxaphene		
Endrin	Xylene		
RADIONUCLIDES			
Radium 226 and 228	Gross alpha particle activity		
Beta particle and photon radioactivity	Radon	Quarterly at 4-yr intervals	FW
Uranium			

FW = finished water at point of entry into distribution system
DS = throughout the distribution system (actual sites may be determined by regulations)

TABLE 6-2
Proposed Raw Water Monitoring Program for Jordan Lake Facilities[1]

Contaminant		Monitoring Frequency
PHYSICAL		
Alkalinity	pH	
Dissolved Oxygen	Temperature	Daily
Conductivity	Turbidity	
Color	Treshold Odor	Weekly
Hardness		
INORGANIC		
Iron		Daily
Manganese		Daily
Nitrate (as Nitrogen)		Monthly
Nitrite		Monthly
Total Phosphorus		Monthly
Aluminum	Mercury	
Antimony	Molybdenum	
Arsenic	Nickel	
Asbestos	Selenium	
Barium	Silver	
Beryllium	Sodium	Annually
Cadmium	Sulfate	
Chromium	Thallium	
Copper	Vanadium	
Cyanide	Zinc	
Lead		
ORGANIC		
Total Organic Carbon		Daily
Dissolved Organic Carbon		

1. Samples collected at raw water intake

Attachment 1:

Local Water Supply Plan Update

North Carolina Department of Environment and Natural Resources

Division of Water Resources

LOCAL WATER SUPPLY PLAN for JORDAN LAKE ALLOCATION APPLICATION 2000-2001

Part 1: Water Supply System Report for Calendar Year 2000

Completed By: CH2M HILL Date: 5/24/2001

SECTION 1: GENERAL INFORMATION

1-A. Water System: Town of Holly Springs 1-B. PWS Identification #: NC03-92-050

1-C. River Sub-Basin(s): Neuse and Cape Fear

1-D. County(s): Wake

1-E. Contact Person: Stephanie L. Sudano, PE Title: Director of Engineering

1-F. Mailing Address: PO Box 8 CITY Holly Springs ZIP 27540

1-G. Phone: 919.557.3935 1-H. Fax: 919.552.5569 1-I. E-mail: stephanie.sudano@ncmail.net

1-J. Type of Ownership (Check One): ☒ Municipality F County F Authority F District F Non-Profit Association F For-Profit Business
F State F Federal F Other_____

SECTION 2: WATER USE INFORMATION

2-A. Population Served in 2000 Year-Round 9,192

Seasonal (if applicable) N/A For Months of _____

2-B. Total Water Use for 2000 including all purchased water: 321.8 Million Gallons (MG)

2-C. Average Annual Daily Water Use in 2000: 0.926 Million Gallons per Day (MGD)

2-D. List 2000 Average Annual Daily Water Use by Type in Million Gallons per Day (MGD): *

	Metered Connections		Non-Metered Connections		Total
Type of Use	Number	Average Use (MGD)	Number	Estimated Average Use (MGD)	Average Use (MGD)
(1) Residential	5013	0.507			0.507
(2) Commercial	285	0.044			0.044
(3) Industrial	13	0.028			0.028
(4) Institutional	10	0.006			0.006
(5) Sales to other Systems					0
(6) System Processes					0
(7) Subtotal [sum (1) thru (6)]					0.585
(8) Average Annual Daily Water Use [Item 2-C]					0.926
(9) Unaccounted-for water [(8) - (7)]					0.341

*Estimated

2-E. List the Average Daily and Maximum Day Water Use by Month for 2000 in Million Gallons per Day (MGD):

	Average Daily Use	Maximum Day Use	Max/Ave Ratio		Average Daily Use	Maximum Day Use	Max/Ave Ratio		Average Daily Use	Maximum Day Use	Max/Ave Ratio
Jan	0.742	0.962	1.30	May	1.183	1.726	1.46	Sep	0.993	1.527	1.54
Feb	0.715	0.892	1.25	Jun	1.090	1.888	1.73	Oct	1.348	1.623	1.20
Mar	0.607	0.980	1.61	Jul	0.915	1.373	1.50	Nov	1.006	1.512	1.52
Apr	0.722	1.021	1.41	Aug	0.861	1.595	1.85	Dec	0.789	1.199	

* 2-F. List the system's 10 Largest Water Users and their Average Annual Daily Use in Million Gallons per Day (MGD) for 2000: (include sales to other systems)

Water User	Average Daily Use	Water User	Average Daily Use
Warp Technologies	.0155	Carolina Brewing Company	.0022
Trellis Point Apartments	.0155	Oakhall Carwash	.0019
Holly Springs Elementary School	.0051	Triangle Tank and Truck Wash	.0016
Splash & Dash Carwash	.0029	Food Lion	.0012
Holly Springs Coin Laundry	.0026	Dorothy Nixon Allen Manor	.0009

2-G. WATER SALES TO OTHER WATER SYSTEMS IN 2000 List all systems that can be supplied water through existing interconnections (regular and emergency). Mark the locations of connections on the System Map.

1 Water supplied to:		2 Average Daily Amount		3 Contract Amount		4 Pipe Size(s)	5* R or E
Water System	PWSID	MGD	# of Days	MGD	Expiration Date	Inches	
N/A							

***NOTE** Column 5 **R=**Regular Use, **E=**Emergency Use

2-H. What is the Total Amount of Sales Contracts for Regular Use? __N/A__MGD

SECTION 3: WATER SUPPLY SOURCES

3-A. SURFACE WATER List surface water source information. Mark and label locations of intakes on the System Map.

1 Name of Stream and/or Reservoir	2 Drainage Area Square Miles	3 Is Withdrawal Metered? Y / N	4 Sub-Basin	5 Average Daily Withdrawal for days used		6 Maximum Day Withdrawal	7* Available Supply		8* System Component Limiting Daily Output		9 Useable On-Stream Raw Water Supply Storage Million Gallons	10* R or E
				MGD	# of Days	MGD	MGD	Qualifier	Capacity MGD	System Component		
								Totals				

***NOTES** Column 7 Supply Qualifiers: **C=**Contract amount, **SY20=2**0-year Safe Yield, **SY50=**50-year Safe Yield, **F=**20% of 7Q10 or other instream flow requirement, **T=**Treatment plant capacity, O=Other (specify)

Column 8 Component: **R=**Raw water pumps, **T=**Treatment facilities, **M=**Transmission main, **D=**Distribution system, **O=**Other (specify)_____

Column 10 **R=**Regular Use, **E=**Emergency Use

3-B. What is the Total Surface Water Supply available for Regular Use? __N/A__ MGD

3-C. Does this system have off-stream raw water supply storage? ☒ No F Yes Useable Capacity _____ Million Gallons

3-D. WATER PURCHASES FROM OTHER WATER SYSTEMS IN 2000

List all systems that can supply water to this system through existing interconnections (regular and emergency). Mark the locations of the connections on the System Map.

1 Water supplied by:		2 Average Daily Amount		3 Contract Amount		4 Pipe Size(s)	5* R or E
Water System	PWSID	MGD	# of Days	MGD	Expiration Date	Inches	
City of Raleigh	03-92-010	0.665	353	1.2	6/30/17	16”	R
Harnett County		0.402	259	1.0	2037	36”	R
Town of Apex	03-92-045	0	0	N/A	N/A	16”	E
Town of Fuquay-Varina	03-92-055	0	0	N/A	N/A	16”	E

***NOTE** Column 5 **R=**Regular Use, **E=**Emergency Use

3-E. What is the Total Amount of Purchase Contracts available for Regular Use? 2.2 MGD (Do not include emergency use connections in total)

3-F. GROUND WATER List well information. ***Mark and label the location of all wells on the System Map.***

1 Name or Number of Well	2 Well Depth Feet	3 Casing Depth Feet	4 Screen Depth Top Feet	4 Screen Depth Bottom Feet	5 Well Diameter Inches	6 Pump Intake Depth Feet	7 Is Well Metered? Y / N	8 Average Daily Withdrawal for Days Used MGD	8 Average Daily Withdrawal for Days Used # of Days	9 Maximum Day Withdrawal MGD	10 12-Hour Supply Million Gallons	11* System Component Limiting Daily Output Capacity MGD	11* System Component Limiting Daily Output System Component	12* R or E
Previous wells no longer in service														

***NOTES** Column 11 Component: **R=**Raw water pumps, **T=**Treatment facilities, **M=**Transmission main, **D=**Distribution system, **O=**Other (specify)_____
Column 12 **R=**Regular Use, **E=**Emergency Use

3-G. What is the Total 12-Hour Supply of all wells available for Regular Use? _____N/A_____ million gallons

3-H. Are ground water levels monitored? F No F Yes How often? _____N/A_____

3-I. Does this system have a wellhead protection program F No F Yes F Under development ____N/A____

SYSTEM NAME Town of Holly Springs PWSID NC03-92-050

3-J. WATER TREATMENT PLANTS List all WTPs, including any under construction, as of 12/31/2000. ***Mark and label locations on the System Map***.

Water Treatment Plant Name	Permitted Capacity MGD	Source(s)
N/A		

3-K. What is the system's finished water storage capacity? _____1.3_____ Million Gallons

SECTION 4: WASTEWATER INFORMATION

4-A. List Average Daily Wastewater Discharges by Month for 2000 in Million Gallons per Day (MGD)

	Average Daily Discharge		Average Daily Discharge		Average Daily Discharge		Average Daily Discharge
Jan	0.693	Apr	0.632	Jul	0.654	Oct	0.668
Feb	0.767	May	0.623	Aug	0.737	Nov	0.654
Mar	0.632	Jun	0.661	Sep	0.738	Dec	0.647

4-B. List all Wastewater Discharge and/or Land Application Permits held by the system***. Mark and label points of discharge and land application sites on the System Map***.

1 NPDES or Land Application Permit Number	2 Permitted Capacity Dec. 31,2000 MGD	3 Design Capacity MGD	4 Average Annual Daily Discharge MGD	5 Name of Receiving Stream	6 Sub-Basin	7 Maximum Daily Discharge MGD
0063096	1.0	1.0	0.676	Utley Creek	Cape Fear	

4-C. List all Wastewater Discharge Connections with other systems. Mark and label the locations of connections on the System Map.

1 Wastewater Discharger		2 Wastewater Receiver		3 Average Daily Amount Discharged or Received		4 Contract Maximum
Name	PWSID	Name	PWSID	MGD	# of Days	MGD
N/A						

4-D. Number of sewer service connections: 543

4-E. Number of water service connections with septic systems: 6 (Number in Cape Fear Sub-basin 2 Number in Neuse Sub-basin 4)

4-F. Are there plans to build or expand wastewater treatment facilities in the next 10 years? F No ☒ Yes Please explain. 1.0 MGD expansion on line in 1999. 2.0 MGD expansion on line in 2002

SECTION 5: WATER CONSERVATION and DEMAND MANAGEMENT ACTIVITIES

5-A. What is the estimated total miles of distribution system lines? 43 miles

5-B. List the primary types and sizes of distribution lines:

	Asbestos Cement (AC)	Cast Iron (CI)	Ductile Iron (DI)	Galvanized Iron (GI)	Polyvinyl Chloride(PVC)	Other
Size Range	4” to 6”	N/A	6” to 16”	N/A	2” to 16”	N/A
Estimated % of lines	5%	0%	20%	0%	75%	0%

5-C. Were any lines replaced in 2000? ☒ No F Yes 0 linear feet

5-D. Were any new water mains added in 2000? F No ☒ Yes 21,588 linear feet

5-E. Does this system have a program to work or flush hydrants? F No ☒ Yes How often? Every 6 months

5-F. Does this system have a valve exercise program? No ☒ Yes How often?

5-G. Does this system have a cross-connection control program? F No ☒ Yes

5-H. Has water pressure been inadequate in any part of the system? ☒No F Yes Please explain.

5-I. Does this system have a leak detection program? ☒ No F Yes

5-J. Has water use ever been restricted since 1992? F No ☒ Yes Please explain. Restrictions during hurricane Fran (1996) and restrictions by Apex in the summer of 1999

5-K. Does this system have a water conservation plan? F No ☒ Yes Please attach a copy. (attached)

5-L. Did this system distribute water conservation information in 2000? F No ☒ Yes

5-M. Are there any local requirements on plumbing fixture water use which are stricter than the NC State Building Code? ☒ No F Yes Please explain.

5-N. Does this system have a program to encourage replacement or retrofit of older, higher water-use plumbing fixtures? F No ☒ Yes

5-O. Does this system have a water shortage or drought response plan? F No ☒ Yes Please attach a copy.

5-P. Is raw water metered? F No F Yes ☒ N/A

5-Q. Is finished water output metered? F No F Yes ☒ N/A

5-R. Do you have a meter replacement program? No ☒ Yes

5-S. How many meters were replaced in 2000? 440 meters

5-T. How old are the oldest meters in the system? 10 years

5-U. What type of rate structure is used? Decreasing Block F Flat Rate ☒ Increasing Block F Seasonally Adjusted F Other 343

5-V. Are there meters for outdoor water use, such as irrigation, which are not billed for sewer services? F No ☒ Yes # of meters 592

5-W. Does this system use reclaimed water or plan to use it within the next five years? F No ☒ Yes # of connections Online in 2002 MGD

SECTION 6: SYSTEM MAP

Review, correct, and return the enclosed system map Check Plot to show the present boundaries of the water distribution system service area, points of intake and discharge, wells, water and wastewater treatment facilities, and water and wastewater interconnections with other systems. Also, show any proposed points of intake or discharge, wells, water and wastewater facilities, water and wastewater interconnections, and future service area extensions. Use symbols shown on the attached map.

Completed By: CH2M HILL Date: 5/29/2001

WATER SYSTEM: PWSID: NC 03-92-050

SECTION 7: WATER DEMAND PROJECTIONS

7-A. Population to be Served	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Year-Round	9,192	21,506	37,275	54,235	71,403	87,211	103,890	114,816	122,221	125,002	125,002
Seasonal (if applicable)*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Please list the months of seasonal demand: _____Attach a detailed explanation of how projections were calculated.

Table 7-B. Projected Average Daily Service Area Demand in Million Gallons per Day (MGD). (Does not include sales to other systems)
Sub-divide each water use type as needed for projecting future water demands.

	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
(1) Residential	0.69	1.61	2.80	4.07	5.36	6.54	7.79	8.61	9.17	9.38	9.38
(2) Commercial	0.09	0.22	0.37	0.54	0.71	0.87	1.04	1.15	1.22	1.25	1.25
(3) Industrial	0.06	0.39	0.73	1.06	1.39	1.73	2.06	2.40	2.73	3.06	3.06
(4) Institutional	0.01	0.03	0.06	0.08	0.11	0.13	0.16	0.17	0.18	0.19	0.19
(5) System Processes	0.05	0.14	0.24	0.35	0.45	0.56	0.66	0.74	0.80	0.83	0.83
(6) Unaccounted-for water	0.09	0.23	0.40	0.58	0.76	0.93	1.10	1.23	1.33	1.39	1.39
(7) Total Service Area Demand [sum (1) thru (6)]*	0.94	2.48	4.35	6.34	8.34	10.22	12.18	13.58	14.66	15.29	15.29

- Includes 5% demand reduction due to water conservation measures

7-C. Is non-residential water use expected to change significantly through 2050 from current levels of use? F No ☒ Yes
If yes, please explain; A 300+ acre industrial park, Wake Southwest Industrial Park, has started to develop. Since it is new the impact is uncertain.

Table 7-D. FUTURE SUPPLIES List all new sources or facilities which were under development as of December 31, 2000 and mark locations on the System Map.

Source or Facility Name	PWSID (if purchase)	Surface water or Ground water	Sub-Basin of Source	Water Quality Classification	Additional Supply MGD	Development Time years	Year Online
B. Everett Jordan allocation[A]	N/A	Surface			2.0	2009	R
Harnett County	03-43-045	purchase			2.0[B]	2001	R
Raleigh	03-92-010	purchase			1.2	1999	R

***NOTE** **R=**Regular Use, **E=**Emergency Use

A. Will be withdrawn and treated by Harnett County Regional WTP or the Town will construct a new intake and WTP on the Cape Fear River

B. Maximum day basis – approximately 0.67-MGD on an average day basis

7-E. What is the Total Amount of Future Supplies available for Regular Use? ____3.87____ MGD

Table 7-F. FUTURE SALES CONTRACTS that have been already agreed to. List new sales to be made to other systems.

1 Water supplied to:		2 Contract Amount and Duration			3 Pipe Size(s) Inches	4* R or E
System Name	PWSID	MGD	Year Begin	Year End		
N/A						

***NOTE** **R=**Regular Use, **E=**Emergency Use

7-G. What is the total amount of existing Future Sales Contracts for Regular Use? _____N/A_____ MGD

SECTION 8: FUTURE WATER SUPPLY NEEDS

Local governments should maintain adequate water supplies to ensure that average daily water demands do not exceed 80% of the available supply. Completion of the following table will demonstrate whether existing supplies are adequate to satisfy this requirement and when additional water supply will be needed.

Table 8-A. AVERAGE DAILY DEMAND AS PERCENT OF SUPPLY Show all quantities in MGD.

Available Supply, MGD	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
(1) Existing Surface Water Supply (Item 3-B)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
(2) Existing Ground Water Supply (Item 3-G)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(3) Existing Purchase Contracts (Item 3-E)	3.2	3.2	3.2	3.2	2.0	2.0	2.0	2.0	0.0	0.0	0.0
(4) Future Supplies (water reuse) (Item 7-E)	0.0	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
(5) **Total Available Supply** [sum (1) thru (4)]	5.2	5.7	6.2	6.2	5.0	5.0	5.0	5.0	3.0	3.0	3.0
Average Daily Demand, MGD											
(6) Service Area Demand (Item 7-B, Line 7)	0.99	2.48	4.35	6.34	8.34	10.22	12.18	13.58	14.66	15.29	15.29
(7) Existing Sales Contracts (Item 2-H)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(8) Future Sales Contracts (Item 7-G)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(9) **Total Average Daily Demand** [sum (6) thru (8)]	0.99	2.48	4.35	6.34	8.34	10.22	12.18	13.58	14.66	15.29	15.29
(10) Demand as Percent of Supply [(9) / (5)] x 100	19%	44%	70%	102%	167%	204%	244%	272%	489%	510%	510%
(11) **Supply Needed to maintain 80% [(9) / 0.8] - (5)**	1.2	3.1	5.4	7.9	10.4	12.8	15.2	17.0	18.3	19.1	19.1
Additional Information for Jordan Lake Allocation											
(12) Sales Under Existing Contracts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(13) Expected Sales Under Future Contracts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(14) Demand in each planning period [(6)+(12)+(13)]	0.99	2.48	4.35	6.34	8.34	10.22	12.18	13.58	14.66	15.29	15.29
(15) Supply minus Demand [(5) - (14)]	4.21	3.22	1.85	-0.14	-3.34	-5.22	-7.18	-8.58	-11.66	-12.29	-12.29

System notes:

8-B. Does Line 10 above indicate that demand will exceed 80% of available supply before the year 2030? F No ☒ Yes

If yes, your Jordan Lake Water Supply Storage Allocation Application should include the following items:

(1) Plans for obtaining additional water supply before demand exceeds 80% of available supply. The sooner the additional supply will be needed, the more specific your plans need to be.

(2) A demand management program to ensure efficient use of your available water supply (for example, conducting water audits at least manually to closely monitor water use, targeting large water customers for increased efficiency; modifying water rate structures; identifying and reducing the amount of leaks

and unaccounted-for water; and reusing reclaimed water for non-potable uses).

(3) Restrictive measures to control demand if the additional supply is not available when demand exceeds 80% of available supply, including; placing a moratorium on additional water connections until the additional supply is available and amending or developing your water shortage response ordinance to trigger mandatory water conservation as water demand approached the available supply.

Future Supply Alternative List the components of each alternative scenario including the planning period when each component will come online.

(#1)	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
(1) Line (15) from Table 8-A "Existing Supply – Demand"	2.21	0.72	-1.15	-3.14	-6.34	-8.22	-10.18	-11.58	-12.66	-13.29	-13.29
(2) Available supply from Project 1 (16-MGD Jordan Lake Allocation – Construct new intake and WTP on Cape Fear River)	0.0	0.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
(3) Supply available for future needs [(1) + (2)]	4.21	3.22	17.85	15.86	12.66	10.78	8.82	7.42	4.34	3.71	3.71
(4) Water withdrawal (Cape Fear)*	0.00	1.92	4.73	7.71	12.51	15.33	18.26	20.38	21.99	22.94	22.94
(5) Total discharge to Source Basin (Cape Fear)*	1.65	3.50	5.69	8.01	10.36	12.55	14.84	16.49	17.75	18.49	18.49
(6) .....Consumptive Use in Source Basin (Cape Fear)*	0.23	0.49	0.80	1.13	1.46	1.77	2.09	2.33	2.50	2.61	2.61
(7) Total discharge to Receiving Basin (Neuse)*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(8) Consumptive Use in Receiving Basin (Neuse)*	0.23	0.49	0.80	1.13	1.46	1.77	2.09	2.33	2.50	2.61	2.61
(9) Interbasin Transfer [(4) – (5) – (6)]	0.00	0.00	0.00	0.00	0.69	1.00	1.33	1.56	1.74	1.84	1.84

* maximum day basis

List details of the future supply options include in this alternative in the table below.

Future Source or Facility Name	PWSID (if purchase)	Surface water or Ground water	Sub-Basin of Source	Water Quality Classification	Additional Supply (MGD)	Development Time years	Year Online
Jordan Lake		surface	Cape Fear	WS-IV	16	7	2007

Future Supply Alternative List the components of each alternative scenario including the planning period when each component will come online.

(#2)	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
(1) Line (15) from Table 8-A "Existing Supply – Demand"	2.21	0.72	-1.15	-3.14	-6.34	-8.22	-10.18	-11.58	-12.66	-13.29	-13.29
(2) Available supply from Project 1 (16-MGD Jordan Lake Allocation – Construct new intake and WTP on Cape Fear River)	0.0	0.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Available supply from Project 2 (Water reuse)											
(3) Supply available for future needs [(1) + (2)]	4.21	3.22	17.85	15.86	12.66	10.78	8.82	7.42	4.34	3.71	3.71
(4) Water withdrawal (Cape Fear)*	0.00	1.92	4.73	7.71	12.51	15.33	18.26	20.38	21.99	22.94	22.94
(5) Total discharge to Source Basin (Cape Fear)*	1.65	3.50	5.69	8.01	10.36	12.55	14.84	16.49	17.75	18.49	18.49
(6) .....Consumptive Use in Source Basin (Cape Fear)*	0.23	0.49	0.80	1.13	1.46	1.77	2.09	2.33	2.50	2.61	2.61
(7) Total discharge to Receiving Basin (Neuse)*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(8) Consumptive Use in Receiving Basin (Neuse)*	0.23	0.49	0.80	1.13	1.46	1.77	2.09	2.33	2.50	2.61	2.61
(9) Interbasin Transfer [(4) – (5) – (6)]	0.00	0.00	0.00	0.00	0.69	1.00	1.33	1.56	1.74	1.84	1.84

* maximum day basis

List details of the future supply options include in this alternative in the table below.

Future Supply Sources

Future Source or Facility Name	PWSID (if purchase)	Surface water or Ground water	Sub-Basin of Source	Water Quality Classification	Additional Supply (MGD)	Development Time years	Year Online
Jordan Lake		surface	Cape Fear	WS-IV	16	7	2007

Future Supply Alternative List the components of each alternative scenario including the planning period when each component will come online.

(#3)	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
(1) Line (15) from Table 8-A "Existing Supply – Demand"	4.21	3.22	1.85	-0.14	-3.34	-5.22	-7.18	-8.58	-11.66	-12.29	-12.29
(2) Available supply from Project 1 (Purchase Finished Water from City of Raleigh)	0.9	2.5	2.4	4.3	6.3	8.2	10.2	11.6	12.7	13.3	13.3
(3) Supply available for future needs [(1) + (2)]	5.15	5.70	4.20	4.20	3.00	3.00	3.00	3.00	1.00	1.00	1.00
(4) Water withdrawal (Neuse)*	1.41	3.72	3.53	6.51	9.51	12.33	15.26	17.38	18.99	19.94	19.94
(5) Total discharge to Source Basin (Neuse)*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(6) ..... Consumptive Use in Source Basin (Neuse)*	0.23	0.49	0.80	1.13	1.46	1.77	2.09	2.33	2.50	2.61	2.61
(7) Total discharge to Receiving Basin (Cape Fear)*	1.70	3.50	5.69	8.01	10.36	12.55	14.84	16.49	17.75	18.49	18.49
(8) Consumptive Use in Receiving Basin (Cape Fear)*	0.23	0.49	0.80	1.13	1.46	1.77	2.09	2.33	2.50	2.61	2.61
(9) Interbasin Transfer [(4) – (5) – (6)]	1.18	3.23	2.73	5.38	8.05	10.56	13.17	15.05	16.48	17.33	17.33

* maximum day basis

List details of the future supply options include in this alternative in the table below.

Future Supply Sources

Future Source or Facility Name	PWSID (if purchase)	Surface water or Ground water	Sub-Basin of Source	Water Quality Classification	Additional Supply (MGD)	Development Time years	Year Online
City of Raleigh	03-92-010	surface	Neuse	WS-V (Falls Lake)	16	Uncertain for future water supplies for Raleigh	Existing purchase contract currently in effect

Future Supply Alternative List the components of each alternative scenario including the planning period when each component will come online.

(#4)	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
(1) Line (15) from Table 8-A "Existing Supply – Demand"	4.21	3.22	1.85	-0.14	-3.34	-5.22	-7.18	-8.58	-11.66	-12.29	-12.29
(2) Available supply from Project 1 (Regional Water Supply)	0.9	2.5	2.4	4.3	6.3	8.2	10.2	11.6	12.7	13.3	13.3
(3) Supply available for future needs [(1) + (2)]	5.15	5.70	4.20	4.20	3.00	3.00	3.00	3.00	1.00	1.00	1.00
(4) Water withdrawal (Neuse)*	1.41	3.72	3.53	6.51	9.51	12.33	15.26	17.38	18.99	19.94	19.94
(5) Total discharge to Source Basin (Neuse)*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(6) ..... Consumptive Use in Source Basin (Neuse)*	0.23	0.49	0.80	1.13	1.46	1.77	2.09	2.33	2.50	2.61	2.61
(7) Total discharge to Receiving Basin (Cape Fear)*	1.70	3.50	5.69	8.01	10.36	12.55	14.84	16.49	17.75	18.49	18.49
(8) Consumptive Use in Receiving Basin (Cape Fear)*	0.23	0.49	0.80	1.13	1.46	1.77	2.09	2.33	2.50	2.61	2.61
(9) Interbasin Transfer [(4) – (5) – (6)]	1.18	3.23	2.73	5.38	8.05	10.56	13.17	15.05	16.48	17.33	17.33

* maximum day basis

List details of the future supply options include in this alternative in the table below.

Future Supply Sources

Future Source or Facility Name	PWSID (if purchase)	Surface water or Ground water	Sub-Basin of Source	Water Quality Classification	Additional Supply (MGD)	Development Time years	Year Online
Middle Creek Reservoir		surface	Neuse	WS-IV	16	20+	2020 or later

Attach additional pages as needed to summarize all alternatives.

8-C. Are peak day demands expected to exceed the water treatment plant capacity by 2010? F No ☒Yes
If yes, what are your plans for increasing water treatment capacity? Holly Springs has had discussions with Harnett County about purchasing additional capacity in the Harnett County Regional WTP. Holly Springs is also evaluating construction of a water treatment plant to withdraw raw water from the Cape Fear River.

8-D. Does this system have an interconnection with another system capable of providing water in an emergency? F No ☒ Yes If not, what are your plans for interconnecting (or please explain why an interconnection is not feasible or not necessary).

8-E. Has this system participated in regional water supply or water use planning? F No ☒ Yes Please describe. Wake County Water /Sewer Plan

8-F. List the major water supply reports or studies used for planning. "Preliminary Engineering Report" by Wooten Company. Wake County Water/Sewer Plan

SECTION 9: TECHNICAL ASSISTANCE NEEDS

Is technical assistance needed:

9-A.	to develop a local water supply plan?	☒ No F Yes
9-B.	with a leak detection program?	☒ No F Yes
9-C.	with a demand management or water conservation program?	☒ No F Yes
9-D.	with a water shortage response plan?	☒ No F Yes
9-E.	to identify alternative or future water supply sources?	F No ☒ Yes
9-F.	with a capacity development plan?	☒ No F Yes
9-G.	with a wellhead or source water protection plan?	☒ No F Yes
9-H.	with water system compliance or operational problems?	☒ No F Yes
9-I.	with Consumer Confidence Reports?	F No ☒ Yes

9-J. Please describe any other needs or issues regarding your water supply sources, any water system deficiencies or needed improvements (storage, treatment, etc.), or your ability to meet present and future water needs. Include both quantity and quality considerations, as well as financial, technical, managerial, permitting, and compliance issues.

Attachment 2:

Water Conservation Ordinance

Section 5-1024. ***Water Shortage and Conservation Measures****

The purpose of this Water Shortage and Conservation Ordinance is: (1) to implement permanent seasonal water conservation measures: (2) to provide for the declaration of increasingly serious stages of water shortages, and (3) to define mandatory water conservation measures to be implemented during these various stages. This Water Shortage and Conservation Ordinance is intended to preserve the water resources of the Town of Holly Springs under specific conditions so that the water demands for human consumption, sanitation, and fire protection of its customers can be met as cost-efficiently as possible throughout the service area of the Town of Holly Springs, North Carolina.

This ordinance shall apply to all users connected directly or indirectly to the Town of Holly Springs public potable water supply, regardless of whether user is located within the city limits or outside of the city limits.

The specific objectives of the Water Shortage and Conservation Ordinance are as follows:

1. To establish permanent seasonal water conservation measure for all customers in the interest of conserving the Town's water supply;
2. To establish the authority of the Town Administrator of the Town of Holly Springs to declare water shortage conditions and to implement and enforce the procedures established herein;
3. To establish mandatory water conservation measures;
4. To establish enforcement protocol for violations of mandatory water conservation measures outlined herein.

Section 5-1024.1 Definitions.

"Contamination" shall mean the addition to any watershed area, reservoir, storage tank, or distribution system of any material that appears in an above-normal concentration or has high nuisance or harmful effect on the consumer or the system.

*** Ordinance 98-10 (Adopted July 21, 1998, creating Section 5-1024 and all subsections on this and subsequent pages)**

"User", shall mean any person using water for any purpose from the Town of Holly Springs water distribution system (either directly or indirectly) and for which either a regular charge is made or, in the case of bulk sales, a cash charge is made at the site of delivery.

"Emergency", when referring, to water shortage, shall mean that conditions exist such that treated water supplies cannot meet customer demands and that serious treated water shortages exist.

"Essential Use", shall mean (1) use of water to sustain normal life and the lives of domestic pets, and to maintain minimum standards of hygiene and sanitation; (2) use of water for patient care and rehabilitation; (3) fire fighting (includes certain testing and drills by the fire department if conducted in the interest of public safety and if approved by the Town Administrator); (4) health and public protection purposes, if specifically approved by health officials and the Town Administrator (includes flushing of water lines and hydrants).

"Hand Watering ", shall mean the use of a hand-held watering device. The device can be attached to the end of a garden hose, but must be attended (and held in the hand of) a person at all times that watering is taking place.

"Mandatory Conservation ", shall mean that conservation measures are, not voluntary, and that if users fail to comply, they are subject to the penalties outlined herein.

"Person ", shall mean any natural person, any group of persons, any firm, partnership, association, corporation, company, or any other organization or entity.

"TOHS", shall mean the Town of Holly Springs acting through its Town Administrator.

"Rationing" shall mean procedures established by the Town of Holly Springs to provide for the equitable distribution of critically limited treated water supplies, in order to balance demand and limited availability, and to ensure that sufficient treated water is available to preserve public health and safety.

"Shall" is mandatory; "May" is permissive.

"Potable Water", shall mean the water in the Town of Holly Springs water distribution system.

"Water Shortage", shall mean that conditions exist when the demands and requirements of water customers served by the Town of Holly Springs cannot be satisfied without depleting the available supply of potable water or the available water supply to or below a critical level, i.e., the level at which the continued availability of water for human consumption, sanitation, and fire protection is jeopardized. Conditions contributing to a water shortage may include but are not limited to the following:

(a) Water supplies are below the level necessary to meet needs;

(b) Water quality has been threatened due to a contamination situatiom

(c) Power outages or equipment malfunction;

(d) Peak customer demands on the water system;

(e) Inability to maintain adequate pressure and/or water supply throughout every portion of the Town of Holly Springs water distribution system;

(f) Natural Disasters.

Section 5-1024.2 Permanent Seasonal Water Conservation Measures.

Every Town of Holly Springs customer shall comply with the following schedule for the irrigation of outdoor landscaping (such as grass, shrubbery, trees, flowers and vegetable gardens) ***from May 1 through September 30 annually:***

1. Irrigation shall be limited to the hours of 7:00 p.m. to 7:00 a.m.

2. For customers whose address numbers end in an odd number, such watering shall be restricted to odd numbered calendar days. An odd numbered calendar day shall be defme~d from midnight to midnight.

3. For customers whose address numbers end in an even number, such watering shall be restricted to even numbered calendar days. An even numbered calendar day shall be defmed from midnight to midnight.

4. Exceptions to these restrictions (on a temporary one to three day basis) may be granted for persons engaged in the business of landscaping on a site by site basis, by permit issued by the Town of Holly Springs.

Section 5-1024.3 Water Conservation Stage 1 -- Water Shortage Warning.

Whenever the Town of Holly Springs experiences a potential water shortage, the Town Manager shall be empowered to declare a Water Shortage Warning.

An extensive publicity campaign will be initiated with conservation efforts publicized through the general news media or any other appropriate method for making such notification public. When Water Shortage Warning conditions are declared, the following mandatory conservation measures shall be imposed:

SUPP.7-98

It shall be unlawful to use water from the public water system supplied by the Town of Holly Springs for the following purposes:

1. To water lawns, grass, shrubbery, trees, flower and vegetable gardens except by hand watering on the schedule outlined under "Permanent Seasonal Water Conservation Measures." Provided, however, that any person regularly engaged in the sale of plants shall be permitted to use water for such purposes, and shall not be restricted to hand watering.

2. To wash automobiles, trucks, trailers, boats, airplanes, or any other type of mobile equipment. Provided, however, that any person regularly engaged in the business of washing motor vehicles and any commercial car wash facility shall be permitted to use water for such purposes.

3. To wash down outside areas such as streets, driveways, service station aprons, parking lots, office buildings. exteriors of existing or newly constructed homes or apartments, sidewalks, or patios, or to use water for other similar purposes. Provided, however, that any person regularly engaged in the business of washing such areas shall be permitted to use water for such purposes.

4. To introduce water into any ornamental fountain pool, pond, or other structure making similar use of water.

5. To use water from public or private fire hydrants for any purpose other than fire suppression or other public emergency or water department need.

6. To use water for dust control, compaction, or construction testing of new waterlines.

7. To intentionally waste treated water.

The owner or occupant of any land or building which either (1) receives water from the Town of Holly Springs and that also utilizes water from a well or supply other than that of the Town of Holly Springs, or (2) is in the city limits and uses a well or pond for irrigation purposes, shall post and maintain in a prominent place thereon a sign furnished by the Town of Holly Springs (for a fee) giving public notice of the use of the well or other sources of supply.

Section 5-1024.4 Water Conservation Stage II -- Water Shortage Emergency.

When the Town of Holly Springs experiences a shortage of treated water, or when the water supply is not adequate to meet normal needs, the Town Manager shall be empowered to declare a Water Shortage Emergency. The declaration shall exist for the duration of the shortage or until it is declared to have ended by the Town of Holly Springs.

In the event of a Water Shortage Emergency, in addition to the restrictions heretofore imposed, the following mandatory water conservation measures shall apply. It shall be unlawful to use water from the public water system supplied by the Town of Holly Springs for the following purposes:

1. To water or sprinkle any lawn, grass, shrubbery, trees, or flowers with treated water.

2. To wash automobiles, trucks, trailers, boats, airplanes, or any other type of mobile equipment.

3. To wash down outside areas such as streets, driveways, service station aprons, parking lots, office buildings, exteriors of homes or apartments, sidewalks, patios, or other similar purposes.

4. To fill newly constructed swimming and/or wading pools or refill swimming and/or wading pools that have been drained.

5. To serve drinking water in restaurants, cafeterias, or other food establishments, except upon request.

6. To use treated water outside a structure for any use other than an emergency use involving fire or as needed by the Town of Holly Springs to maintain the water system.

7. To make any nonessential use of treated water for commercial or public use.

Section 5-1024.5 Water Conservation Stage III -- Water Shortage Crisis:

Whenever the Town Manager has declared a Water Shortage Crisis and finds a need to provide for the equitable distribution of critically-limited treated water or water supplies to ensure that sufficient treated water is available to preserve public health and safety of the citizens, he shall enforce a water rationing policy. Such rationing policy may be developed at the time of the declaration of the Water Shortage Crisis and should be reflective of the following criteria:

1. It is imperative that water customers achieve an immediate further reduction in water use in order to extend existing water supplies and, at the same time, assure that sufficient water is available to preserve the public health and sanitation and to provide fire protection service. This immediate further reduction in water usage is another step along a continuum of responses to any Water Shortage Crisis. Should the crisis continue, further reductions in water usage may be required. It must be emphasized that additional usage reductions in the rationed area is a valid and attainable goal reflective of the conditions of the crisis.

2. The policy must provide for equitable reductions in water usage and for equal sacrifice on the part of each water customer. The success of this policy depends on the cooperation of all water customers in the emergency area.

3. The policy must ensure that fire protection is maintained where possible, tank trucks shall use non-potable water.

4. The policy shall make it unlawful to fail to act in accordance with the restrictions on treated water use or to attempt to evade or avoid such water rationing restrictions.

5. The policy may include additional measures of mandatory conservation controls such as a percentage reduction in consumption, termination of service to specific areas in the water system on a rotating basis, prohibition of all industrial uses of potable water, etc., or whatever is necessary to protect the health and safety of the customers of the water system.

Section 5-1024.7 Regulations.

During, the effective period of any water shortage, warning, emergency, or crisis, the Town of Holly Springs is empowered to promulgate such regulations or policies as may be necessary to carry out the provisions of this Ordinance. The Town Manager of the Town of Holly Springs, or his duly authorized agent charged with implementation and enforcement of this Ordinance, shall be and is hereby granted the authority to implement and enforce any of the treated water use restrictions.

The Town Manager shall have authority to implement, maintain and rescind any one or more of the above restrictions and to make them applicable during various times of the day as he deems appropriate to protect the public health, safety and welfare until he determines that the conditions requiring their imposition no longer exist.

Section 5-1024. Enforcement.

Any person who violates the provisions of this Ordinance, who fails to carry out the duties and responsibilities imposed by this Ordinance, or who impedes or interferes with any action undertaken or ordered pursuant to this Ordinance shall be subject to enforcement actions.

Enforcement actions may include, but are not limited to the following:

1. Notice of Violation (NOV)

Whenever the Town of Holly Springs finds that any user has violated or is violating this Ordinance or any prohibition, limitation, or requirement contained therein, the Town Manager, or his duly authorized agent, shall serve upon such a person a written notice stating the nature of the violation. The written notice of the violation shall be (1) mailed, certified with return receipt requested, to the customer of record and to any other person known to the Town of Holly Springs who is responsible for the violation or its correction, or (2) hand delivered to the customer of record or to the person in charge of the premise where the violation(s) occurred. The NOV shall inform the user of the violation and his/her responsibility to halt the activity within a specified period of time.

2. Suspensions of Service

In the event any treated water use restriction implemented by the Town is violated, the Town Manager shall terminate or restrict the service of the Person(s) where such violation occurs and may in addition thereto or in the alternative take such other appropriate legal action as provided by law.

At such time as the Town Manager is satisfied that the Person is no longer in violation of any treated water use restrictions, the Town Manager shall reinstate the Person's water service pursuant to the following:

(a) After payment of a suspension/reconnection charge of $75.00 for first time offenders;

(b) After payment of a suspension/reconnection charge of $300.00 for second time offenders;

(c) After payment of a suspension/reconnection charge of $500.00 for each additional violation.

(d) Civil Penalties

The Town shall assess a civil penalty of up to $1,000.00 per violation to any offender who shall continue any violation beyond the time limit provided for in the aforementioned Notice of Violation. Each day in which a violation of any provision of this Ordinance shall occur or continue shall constitute a separate and distinct offense.

In determining the amount of the civil penalty, the Town of Holly Springs shall consider the following:

1. The degree and extent of the harm to the natural resources, to the public health, or to public or private property resulting from the violation;
2. The duration and gravity of the violation;
3. Whether the violation was committed willfully or intentionally;
4. The prior record of the violator in complying or failing to comply with the Water Shortage Response Ordinance;
5. The costs of enforcement to the Town of Holly Springs.

THE TOWN OF
Holly
Springs

Town of Holly Springs

Ordinance No.: **00-05**
Date Submitted: May 2, 2000
Date Adopted: June 6, 2000.
Effective Date: June 6, 2000.

AN ORDINANCE TO AMEND THE TOWN CODE OF THE TOWN OF HOLLY SPRINGS, NORTH CAROLINA, MODIFYING THE SCHEDULE FOR LAWN AND LANDSCAPING IRRIGATION DURING THE ANNUAL WATER CONSERVATION SEASON.

BE IT ORDAINED by the Board of Commissioners of the Town of Holly Springs, North Carolina that Section 5-1024.2 Permanent Seasonal Water Conservation Measures of the Town Code is amended as follows:

Section 1. That subsections (1), (2), (3) and (4) of Section 5-1042.2 be replaced in their entirety by the following text:

1. Irrigation shall be limited to the hours between midnight and 7 a.m. and between 7 p.m. and midnight of a resident's assigned irrigation day as described in subsections (2) and (3). No irrigation shall take place during the daylight hours between 7 a.m. and 7 p.m. on any day, when most irrigation would be lost to evaporation. No irrigation shall take place during any time on a Monday, except as provided for in subsection (4).

2. For customers whose address numbers end in an even digit, such watering shall be restricted to Tuesdays, Thursdays and Saturdays.

3. For customers whose address numbers end in an odd digit, such watering shall be restricted to Wednesdays, Fridays and Sundays.

4. Exceptions to these restrictions (on a temporary one- to three-day basis) may be granted for persons engaged in the business of landscaping or for those establishing new lawns or landscaping on a site by site basis, by permit issued by the Town of Holly Springs. Such permit may be renewable.

P.O. Box 8
128 S. Main Street
Holly Springs, N.C. 27540

(919) 552-6221

Fax: (919) 552-5569

Mayor's Office Fax:
(919) 552-0654

Section 2. REPEAL OF CONFLICTING ORDINANCES. All ordinances or parts of the Code of the Town of Holly Springs conflicting or inconsistent with the provisions of this ordinance are hereby repealed.

Section. 3. SEVERABILITY. If any section, part of a section, paragraph, sentence, clause, phrase, or word of this Ordinance is for any reason held or declared to be unconstitutional, inoperative or void, such holdings shall not affect the remaining portion of this Ordinance and it shall be construed to have been the legislative intent to pass the Ordinance without such unconstitutional, invalid or inoperative part therein, and the remainder of this Ordinance after the exclusion of such part or parts shall be deemed to be held valid as if such part or parts had not been included therein, or if this Ordinance or any provisions thereof shall be held inapplicable to any person, group of persons, property, kind of property, circumstances, or set of circumstances, such holdings shall not affect the applicability thereof to any other person, property or circumstances.

Section 4. INCLUSION IN CODE. It is the intention of the Board of Commissioners entered as hereby ordained, that the provisions of this Ordinance shall become and be made part of the Code of Ordinances of the Town of Holly Springs, North Carolina; that the Section(s) of this Ordinance may be renumbered or relettered to accomplish such intention, and that the word "Ordinance" may be changed to "Section," or "Article" or other word.

Section. 5 EFFECTIVE DATE. Approved this the 6th day of June 2000.

Town of Holly Springs

THE TOWN of HOLLY SPRINGS 1876 WAKE COUNTY NORTH CAROLINA

Gerald W. Holleman, Mayor

ATTESTED TO:

Joni Powell, CMC
Town Clerk

Attachment 3:
Cost Estimates of Water Supply Improvements

Alternative 1
Jordan Lake Allocation and Construct new Intake and WTP on Cape Fear

Jordan Lake Supply

	Unit	Quantity	Unit Cost	Item Cost
Pipeline Construction				
Open-Cut Pipe - FW	LF	33,000	$127	$4,191,000
Open-Cut Pipe - RW	LF	60,000	$153	$9,180,000
			Subtotal	$13,371,000
Pump/Booster Station Pump Systems				
Raw Water Intake and Pump Station	EA	1	$1,329,492	$1,329,000
Finished Water Booster Pump Station	/mgd	26	$1,790	$47,000
			Subtotal:	$1,376,000
New Water Treatment Plant	EA	1	$28,378,016	$ 28,378,000
Mobilization/Demobilization			(7% of Construction Cost)	$3,019,000
Contingency			(10% of Construction Cost)	$4,313,000
Contractor's OH and Profit			(15% of Construction Cost)	$6,469,000
			Construction Costs (total)	$56,926,000
Engineering Design and Administration			(10% of Construction Cost)	$5,693,000
Legal and Administrative Costs			(5% of Construction Cost)	$2,846,000
Cost of Regulatory Requirements			(5% of Construction Cost)	$2,846,000
Land/Easement Acquisition	Acre	40	$10,000	$400,000
DWR Allocation Payment				$891,000
			Jordan Lake Capital Costs	$69,602,000
			Net Present Value of O&M Costs	$7,312,000
			Total Jordan Lake Costs	$76,914,000

Interim Purchase Costs

Because the intake and pump station could not be online until 2007, there would need to be one year of water purchasing for the Town of Holly Springs. There would be no construction or O&M costs related to this as the infrastructure is already in place. There would also be no need for a Capacity Fee since Holly Springs has already paid this fee for other purchases.

Net Present Value of Consumption Fee	$908,000

Total Net Present Value	$77,822,000
Incremental Supply (mgd)	16
Unit Costs ($/gpd)	$4.86

Alternative 2
Jordan Lake Allocation and Purchase Capacity in Harnett County Regional WTP

Capacity in Harnett County	**Unit**	**Quantity**	**Unit Cost**	**Item Cost**
Pipeline Construction				
Additional Pipe for added flow	LF	105,000	$153	$16,065,000
Mobilization/Demobilization			(7% of Construction Cost)	$1,125,000
Contingency			(10% of Construction Cost)	$1,607,000
Contractor's OH and Profit			(15% of Construction Cost)	$2,410,000
			Construction Costs (total)	$21,207,000
Engineering Design and Administration			(10% of Construction Cost)	$2,121,000
Legal and Administrative Costs			(5% of Construction Cost)	$1,060,000
Cost of Regulatory Requirements			(5% of Construction Cost)	$1,060,000
Capacity Payment to Harnett County	/mgd	26	$815,000	$21,190,000
DWR Allocation Payment				$891,000
			Cape Fear Capital Costs	$47,529,000
Net Present Value of O&M Costs (Includes Consumption Fees to Harnett County)				$60,106,000
			Total Cape Fear Costs	$107,635,000
			Incremental Supply (mgd)	16
			Unit Cost ($/gpd)	$6.73

Alternative 3a
Purchase Finished Water from City of Raleigh

Purchase from Raleigh	**Unit**	**Quantity**	**Unit Cost**	**Item Cost**
Purchase from Raleigh				
Capacity Fee for Peak Day	/mgd	24	$729,919	$17,518,000
Net Present Value of Monthly Capacity Fee				$16,524,000
Net Present Value of Consumption Fee				$25,398,000
Purchase from Harnett County				
Net Present Value of Consumption Fee				$23,442,000
Pipeline Construction				
Parallel Finished Water Pipeline to City of Raleigh	LF	125,000	$153	$19,125,000
Mobilization/Demobilization			(7% of Construction Cost)	$1,339,000
Contingency			(10% of Construction Cost)	$1,913,000
Contractor's OH and Profit			(15% of Construction Cost)	$2,869,000
			Construction Costs (total)	$25,246,000
Engineering Design and Administration			(20% of Construction Cost)	$5,049,000
Legal and Administrative Costs			(10% of Construction Cost)	$2,525,000
Cost of Regulatory Requirements			(10% of Construction Cost)	$2,525,000
			Raleigh Purchase and Capital Costs	$118,227,000
			Net Present Value of O&M Costs	$5,556,000
			Total Raleigh Purchase Costs	$123,783,000
			Supply (mgd)	16
			Unit Costs ($/gpd)	$7.74

Alternative 3b
Purchase Finished Water from City of Raleigh

Purchase from Raleigh

	Unit	Quantity	Unit Cost	Item Cost
Costs Related to Purchase				
Capacity Fee for Peak Day	/mgd	24	$729,919	$17,518,000
Net Present Value of Monthly Capacity Fee				$16,524,000
Net Present Value of Consumption Fee				$25,398,000
Purchase from Harnett County				
Net Present Value of Consumption Fee				$23,442,000
Pipeline Construction				
Open-Cut Pipe - FW	LF	125,000	$153	$19,125,000
IBT Effluent Return Pipeline				
Open-Cut Pipe	LF	95,000	$153	$14,535,000
Booster Pump Station	EA	1	$25,950	$26,000
			Subtotal	$33,686,000
Mobilization/Demobilization			(7% of Construction Cost)	$2,358,000
Contingency			(10% of Construction Cost)	$3,369,000
Contractor's OH and Profit			(15% of Construction Cost)	$5,053,000
			Construction Costs (total)	$44,466,000
Engineering Design and Administration			(20% of Construction Cost)	$8,893,000
Legal and Administrative Costs			(10% of Construction Cost)	$4,447,000
Cost of Regulatory Requirements			(10% of Construction Cost)	$4,447,000
Land/Easement Acquisition			(5% of Construction Cost)	$2,223,000
			Raleigh Purchase Capital Costs	$147,358,000
			Net Present Value of O&M Costs	$9,529,000
			Total Raleigh Purchase Costs	$156,887,000
			Incremental Supply (mgd)	16
			Unit Costs ($/gpd)	$9.81

Alternative 4a
Construct New Middle Creek Reservoir

Middle Creek Reservoir				
	Unit	**Quantity**	**Unit Cost**	**Item Cost**
I. Dam and Reservoir Construction				
Reservoir Site Preparation/Clearing	Acres	1,600	$3,068	$4,909,000
New Dam	cubic yard	187,200	$128	$23,931,000
Electrical/I&C Allowance (8% of Dam cost)	EA	1	$1,914,480	$1,914,000
Water Quality/Sediment Control	EA	1	$1,000,000	$1,000,000
Access Roads	EA	1	$520,000	$520,000
Finishes (Site Work,Piezometers, etc -10% of Dam Cost)	EA	1	$2,340,000	$2,340,000
Road and Bridge Relocations/Replacement	EA	1	$7,000,000	$7,000,000
			Subtotal	$41,614,000
II. Finished Water Transmission				
FW Transmission Line (30 inch)	LF	33,900	$127	$4,299,000
FW Transmission Line (24 inch)	LF	119,612	$102	$12,233,000
FW Booster Pump Station 1 (Cary)	mgd	15	$204,537	$3,068,000
Pipeline Clear and Grub (incl. easement preparation)	Acres	10	$2,045	$20,000
Add for Rock Excavation (applied to 25% of pipe length)	LF	38,378	$51	$1,962,000
Street/RR Crossings (Bore/Jack)	LF	600	$511	$307,000
Air Release Valves	EA	20	$2,045	$41,000
Street Repair (Asphalt Patch, 20% of total pipe length)	LF	30,702	$36	$1,099,000
Easement/ROW Restoration (80% of pipe length)	LF	122,810	$5	$628,000
Traffic Control (applied to project length in Street/ROW)	LF	153,512	$15	$2,355,000
			Subtotal	$26,012,000
III. Water Treatment Plant with Raw Water Intake and Conveyance				
New Middle Creek Regional WTP	EA	1	$53,339,236	$53,339,000
RW Intake Structure	EA	1	$3,857,751	$3,858,000
RW Transmission Piping (dual 54 inch lines)	LF	10,560	$221	$2,333,000
			Subtotal	$59,530,000
Holly Springs Percentage of Above Costs		69%		$87,193,000
Mobilization/Demobilization			(7% of Construction Cost)	$6,104,000
Contingency			(10% of Construction Cost)	$8,719,000
Contractor's OH and Profit			(15% of Construction Cost)	$13,079,000
			Construction Costs, Total	$115,095,000
Engineering Design and Administration			(20% of Construction Cost)	$23,019,000
Legal and Administrative Costs			(10% of Construction Cost)	$11,510,000
Cost of Regulatory Requirements			(10% of Construction Cost)	$11,510,000
Land/Easement Acquisition (HS Share)	Acres	1,600	$10,000	$10,971,000
Wetland Mitigation (HS Share)	Acres	2,280	$30,000	$46,903,000
			Middle Creek Capital Costs	$219,008,000
			Net Present Value of O&M Costs	$15,521,000
			Total Middle Creek Costs	$234,529,000
			Incremental Supply (mgd)	16
			Unit Cost ($/gpd)	$14.66

Alternative 4b
Construct New Middle Creek Reservoir

Middle Creek Reservoir				
	Unit	**Quantity**	**Unit Cost**	**Item Cost**
I. Dam and Reservoir Construction				
Reservoir Site Preparation/Clearing	Acres	1,600	$3,068	$4,909,000
New Dam	cubic yard	187,200	$128	$23,931,000
Electrical/I&C Allowance (8% of Dam cost)	EA	1	$1,914,480	$1,914,000
Water Quality/Sediment Control	EA	1	$1,000,000	$1,000,000
Access Roads	EA	1	$520,000	$520,000
Finishes (Site Work,Piezometers, etc -10% of Dam Cost)	EA	1	$2,340,000	$2,340,000
Road and Bridge Relocations/Replacement	EA	1	$7,000,000	$7,000,000
			Subtotal	$41,614,000
II. Finished Water Transmission				
FW Transmission Line (30 inch)	LF	33,900	$127	$4,299,000
FW Transmission Line (24 inch)	LF	119,612	$102	$12,233,000
FW Booster Pump Station 1 (Cary)	mgd	15	$204,537	$3,068,000
Pipeline Clear and Grub (incl. easement preparation)	Acres	10	$2,045	$20,000
Add for Rock Excavation (applied to 25% of pipe length)	LF	38,378	$51	$1,962,000
Street/RR Crossings (Bore/Jack)	LF	600	$511	$307,000
Air Release Valves	EA	20	$2,045	$41,000
Street Repair (Asphalt Patch, 20% of total pipe length)	LF	30,702	$36	$1,099,000
Easement/ROW Restoration (80% of pipe length)	LF	122,810	$5	$628,000
Traffic Control (applied to project length in Street/ROW)	LF	153,512	$15	$2,355,000
			Subtotal	$26,012,000
III. Water Treatment Plant with Raw Water Intake and Conveyance				
New Middle Creek Regional WTP	EA	1	$53,339,236	$53,339,000
RW Intake Structure	EA	1	$3,857,751	$3,858,000
RW Transmission Piping (dual 54 inch lines)	LF	10,560	$221	$2,333,000
			Subtotal	$59,530,000
Holly Springs Percentage of Above Costs		69%		$87,193,000
Mobilization/Demobilization			(7% of Construction Cost)	$6,104,000
Contingency			(10% of Construction Cost)	$8,719,000
Contractor's OH and Profit			(15% of Construction Cost)	$13,079,000
			Construction Costs, Total	$115,095,000
Engineering Design and Administration			(20% of Construction Cost)	$23,019,000
Legal and Administrative Costs			(10% of Construction Cost)	$11,510,000
Cost of Regulatory Requirements			(10% of Construction Cost)	$11,510,000
Land/Easement Acquisition (HS Share)	Acres	1,600	$10,000	$10,971,000
Wetland Mitigation (HS Share)	Acres	2,280	$30,000	$46,903,000
			Middle Creek Capital Costs	$219,008,000
			Net Present Value of O&M Costs	$15,521,000
			Total Middle Creek Costs	$234,529,000
IBT Issues				
IBT Effluent Return Pipeline				
Open-Cut Pipe	LF	101,000	$127	$12,827,000
Booster Pump Station	EA	1	$24,160	$24,000
Mobilization/Demobilization			(7% of Construction Cost)	$900,000
Contingency			(10% of Construction Cost)	$1,285,000
Contractor's OH and Profit			(15% of Construction Cost)	$1,928,000
			Construction Costs (total)	$16,964,000
Engineering Design and Administration			(20% of Construction Cost)	$3,393,000
Legal and Administrative Costs			(10% of Construction Cost)	$1,696,000
Cost of Regulatory Requirements			(10% of Construction Cost)	$1,696,000
Land/Easement Acquisition			(5% of Construction Cost)	$848,000
			IBT Capital Costs	$24,597,000
			Net Present Value of O&M Costs	$1,901,000
			Total IBT Costs	$26,498,000
			Total Net Present Value	$261,027,000
			Incremental Supply (mgd)	16
			Unit Cost ($/gpd)	$16.31