HARNETT COUNTY DEPARTMENT
OF
PUBLIC UTILITIES

MEMBER NORTH CAROLINA
RURAL WATER ASSOCIATION

MEMBER AMERICAN WATER
WORKS ASSOCIATION

BUIES CREEK - COATS WATER & SEWER DISTRICT
SOUTH CENTRAL WATER & SEWER DISTRICT
WEST CENTRAL WATER & SEWER DISTRICT

NORTHEAST METROPOLITAN WATER DISTRICT
EAST CENTRAL WATER & SEWER DISTRICT
BUNNLEVEL - RIVERSIDE DISTRICT

NORTHWEST WATER & SEWER DISTRICT
SOUTHWEST WATER & SEWER DISTRICT
SOUTHEAST WATER & SEWER DISTRICT

May 30, 2001

Mr. John Morris
Division of Water Resources
1611 MSC
Raleigh, NC 27699 1611

Re: Lake Jordan Water Supply Allocation
Harnett County, North Carolina

Dear Mr. Morris:

The purpose of this letter is to serve as our introductory letter transmitting the Harnett County/Lake Jordan Round Three Water Supply Allocation Application to the Division of Water Resources for your review and consideration. Harnett County is pleased that we have been able to plan for a water system that will meet the needs of the region of the Cape Fear Valley located between Wake County and Cumberland County. Our outreach not only includes four of the seven incorporated Towns within the County, but all of the incorporated area and areas within Wake County, Cumberland County and Moore County. We are currently in discussions to provide water to parts of Chatham County and Lee County. We are truly a regional system and are blessed that the Cape Fear River provides an abundance of good quality water for us to treat to serve our growing customer base.

In your instructions for the Application, you request that the County specifically provide information regarding the following four factors:

1. ***A commitment to all financial obligations related to receiving the allocation from Jordan Lake.***

   The County and the Harnett County water system recognize that should we be successful in obtaining an allocation from Lake Jordan that there is an annual commitment that will be required to provide for the operation and maintenance of Jordan Lake. The cost of this fee would be passed on to our 60,000 plus service population in the form of an increase in user charge. Given the size of our system, the increase required for this fee would be nominal and have minimum impact on our user fees. The Harnett County water system

will commit to this user fee increase if we are successful in obtaining our allocation.

2. ***The total level one and level two water supply storage allocation requests in mgd.***

A detailed discussion of the County's allocation request is presented in Section V of the Application. Since Harnett County depends on a run of river water supply, we believe it appropriate to ensure sufficient supply is available for the maximum day demand of the system. While it is noted that Level Two requests extend for a 30 year planning period, Harnett County is projected to need an additional 18 mgd at the end of its 50 year planning period beginning in year 2033. Accordingly, this request is for 18 mgd.

3. ***Description of any regional partnerships in which the applicant is participating.***

Harnett County supplies water as a regional partner to units of government within the County and in three counties surrounding Harnett County. The systems currently under contract to purchase water from Harnett County include the Towns of Coats, Lillington, Angier, Linden, Fuquay Varina, Holly Springs, Woodlake, Moore County, and Spring Lake.

4. ***Any additional information that would be helpful in evaluating the application and documenting the applicant's need for using Jordan Lake.***

The Harnett County intake is uniquely situated along the Cape Fear just up-stream of the low flow gauging station at Lillington, accordingly, as part of the allocation process, the County requests that the Division of Water Resources consider a better defined operational rule which we believe would allow the County to withdraw water from a river water supply at Lillington and meet the County's needs well into the future without having to obtain an allocation from Jordan Lake. This can be achieved through the Corps of Engineers including water withdrawn from the river at the water intake in the low flow target at the Lillington gauge. A further discussion of this is provided in Section III of the Application.

We appreciate this opportunity to form a well-planned water supply for all systems on the Cape Fear River. If we can provide additional information, please let us know.

Sincerely,

Rodney M. Tart, Director

RMT/cm

Enclosures

c: Neil Emory – Harnett County Board of Commissioners
Gary Averitte – Water Resources Manager, Harnett County
Dan Boone – The Wooten Company

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Section I. Water Demand Forecast Documentation

1. Methodology

The Harnett County water system is unique in the number of separate systems served and diversity of their customer base. The system provides water to four of the six incorporated areas within the County and all of the unincorporated area. Outside of Harnett County, the system serves areas of the surrounding Counties of Wake, Cumberland and Moore County. Talks are underway to provide water to Chatham and Lee County. Incorporated areas outside of the County served by the water system include Holly Springs, Fuquay-Varina, Woodlake and Spring Lake. For the purposes of determining system populations as a part of the round three Jordan Lake Water Supply Allocation, Lillington, Coats, Angier, and Linden are assumed to be a part of the overall Harnett County system in terms of growth rates and per capita water consumption. Systems outside of the County are considered to be separate and the population projections and demands for each of these systems are derived independently.

2. Harnett County Population and Demands

After analyzing the data available to Harnett County water system to project system demands, it was determined that 1997 would serve as a base year. This is selected since each of the systems within the County that will be included within this demand projection completed the 1997 Water Supply Plans. Accordingly all of the data used will be derived in this base year. Below is a table listing the 1997 water use statistics for each of the systems. Adjustments of demand were required to match with the record of water consumption recorded by the Harnett County water system.

Water System	Number of Residential Customers	Residential Demand mgd	Commercial Demand mgd	Industrial Demand mgd	Loss mgd	In-plant Consumption mgd
Harnett County	19,350	2.8	0.04	0.05	0.61	0.149
Lillington	1,015	0.109	0.018	0.233	0.124	
Coats	920	0.116			0.084	0.036
Angier	1,920	0.255	0.07	0.009	0.01	.02
Linden	340	0.049	0.001			
TOTALS	**23,545**	**3.329**	**0.129**	**0.292**	**0.808**	**0.149**

Lillington: Adjusted 200 industrial customers to residential. Additionally adjusted water loss so that total average demand would equal 0.484.
Coats: Adjusted usage to 0.2 mgd.
Angier: Adjusted usage to 0.324.

The estimated system population in 1997 is 61,217 (23,545 x 2.6 persons per household). Using data supplied by the State of North Carolina, it can be determined that the growth rate experienced by the County between 1990 and 1999 is 2.59 percent. Even though it can be estimated that the growth rate in the future for Harnett County will be greater than that experienced during the 1990 decade when compared to the growth rate that Wake County has been experiencing over the last two decades, it is reasonable to consider for this study that the growth rate will remain constant through 2050. The 2000 population estimated for the County's water system is 66,097. The 2050 population is estimated to be 237,374. (See worksheet).

The per capita consumption estimated for the year 2000 is obtained by dividing the average water use per County water system by the estimated population (4.08 mgd ÷ 66,097). This makes the per capita consumption for the year 2000 to be 62 gpd/cap. This consumption appears to be reasonable when compared to surrounding systems. Accordingly, it will be used for demand projections for the County system during the study period.

3. Systems Outside the County Under Contract

Holly Springs

The Harnett County water system is currently contracted to supply up to 2 mgd to the Town of Holly Springs. Additionally, the County has just recently completed the construction of the 36 inch diameter water line to serve Holly Springs and Fuquay-Varina. Holly Springs has hydraulic capacity within the 36 inch water line to allow the County to supply up to 8.5 mgd to the Town. Since Holly Springs is applying for an allocation request from Lake Jordan that will be used by Harnett County to meet their future demand, Holly Springs is not considered as a part of this analysis.

Fuquay-Varina

Fuquay-Varina is currently under contract with three different water systems to meet their demands. Raleigh through Garner along Highway 401 connection can supply up to 0.75 mgd. Johnston County through the Highway 42 connection can supply up to 2 mgd. Fuquay-Varina is currently contracted with Harnett County for 1 mgd and has a conveyance allocation in the new 36 inch pipeline of 5 mgd. Developing future demands from Fuquay-Varina, it is assumed that all of the water supply in excess of the existing contract amounts required to meet the future demand will be supplied by Harnett County. A summary of the demand projections is as follows:

In determining the future demands for Fuquay-Varina, the demands projected in the 1997 Water Supply Plans were extrapolated through the Year 2050.

DEMAND PROJECTIONS

Year	1997	2000	2010	2020	2030	2040	2050
Demand	0.719	1.051	2.19	4.67	6.22	8.01	9.79
Harnett County Demand	0.5	0.5	1.1	1.92	3.47	5.76	7.04

Woodlake

Woodlake did not submit a Water Supply Plan to use as a base. System is receiving all of it service from Harnett County as of the year 2000. Since Woodlake is a resort community, we have estimated a growth rate of 3 percent a year and have applied that to the year 2000 demand to estimate the demand for the entire period. The demand estimates are shown in the following table.

DEMAND PROJECTIONS

Year	2000	2010	2020	2030	2040	2050
Demand	0.093	0.125	0.168	0.225	0.303	0.408

Riverside

Riverside is a private water system that was purchased by the County and brought on-line in 2001. Since the Riverside demand is not included in the projections within the County, their demands are estimated separately at the growth rate of 2.59 percent per year. The Riverside system demand projections are shown in the following table.

DEMAND PROJECTIONS

Year	2000	2010	2020	2030	2040	2050
Demand	0.04	0.517	0.665	0.086	0.111	0.144

Summaries of these data are shown in the attached worksheet. It should be noted that demand data presented is based upon the average daily demand. This may be adequate to evaluate water supplies available from a reservoir source, it is necessary to use a maximum day demand analysis to properly evaluate water available from a run of the river source. Accordingly, the worksheet displays the maximum day demand estimates in the study period. The max day/average day demand ratio used in these projections is 1.5. While this number is somewhat lower than the existing system ratio, it is expected that as the system develops the more users and a greater diversity of use meet max day water demand ratio will drop to this level.

LOCAL WATER SUPPLY PLAN for JORDAN LAKE ALLOCATION APPLICATION 2000-2001
Part 2: Water Supply Planning Report

Completed By: **Gary Averitte** Date: **05/24/2001**

WATER SYSTEM: **Harnett County Department of Public Utilities// Harnett County Regional Water System** PWSID: **03-43-045**

SECTION 7: WATER DEMAND PROJECTIONS

7-A. Population to be Served

	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Year-Round	66,097	75,112	85,356	96,997	110,226	125,259	142,342	161,755	183,816	208,885	237,374
Seasonal (if applicable)*											

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

***HARNETT CO. POPULATION LESSS ERWIN AND DUNN**

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	4.08	4.657	5.292	6.014	6.834	7.766	8.825	10.029	11.397	12.951	14.717
(2) Commercial	0.19	0.18	0.21	0.23	0.27	0.30	0.34	0.39	0.44	0.50	0.57
(3) Industrial											
(4) Institutional	0.286	0.408	0.464	0.527	0.599	0.681	0.774	0.880	0.999	1.136	1.291
(5) System Processes	0.89	0.559	0.635	0.722	0.820	0.932	1.059	1.203	1.368	1.554	1.766
(6) Unaccounted-for water	1.00	0.930	1.06	1.200	1.370	1.550	1.770	2.010	2.280	2.590	2.940
(7) Total Service Area Demand [sum (1) thru (6)]	6.446	6.736	7.655	8.699	9.885	11.234	12.766	14.507	16.485	18.733	21.288

****DISTRIBUTED ALL CONTRACT SALES WITHIN COUNTY TO SERVICE AREA DEMAND CALCULATIONS**

7-C. Is non-residential water use expected to change significantly through 2050 from current levels of use? F No F Yes
If yes, please explain;_____

JORDAN LAKE WATER SUPPLY ALLOCATION ROUND #3
WATER DEMANDS BY SECTOR

WATER SERVICE PROVIDER:	Harnett County Public Utilities	
ESTIMATED POPULATION SERVED BY SYSTEM:	63,307	People
AVERAGE DAILY WATER DEMAND FOR SYSTEM:	7.3700	MGD
Total Average Daily Water Use for Single-Family Residential Users:	3.4400	MGD
Total Average Daily Water Use for Multi-Family Residential Users:	0.0115	MGD
Total Average Daily Water Use for Commercial Users:	0.1300	MGD
Total Average Daily Water Use for Industrial Users:	0.0000	MGD
Total Average Daily Water Use for Institutional Users:	0.0500	MGD

Meter Size	5/8"	3/4"	1"	1.5"	2"	3"	4"	6"	8"
5/8" Meter Equiv. Ratios	1	1.5	2.5	5	8	15	25	50	80

(Source: APWA, Manual C-704)

Single-Family Residential Users Average Daily Water Use For Class: 3.44 MGD

	Number of Customers By Meter Size									Totals
	5/8"	3/4"	1"	1.5"	2"	3"	4"	6"	8"	
# Accounts (Customers)	21,530		14	7	21					21,572
# Meters	21,530		14	7	21					21,572
Ratio	1	1.5	2.5	5	8	15	25	50	80	
Total Meter Equivalents	21,530.0	0.0	35.0	35.0	168.0	0.0	0.0	0.0	0.0	21,768.0

Single-Family Residential Class Usage Factors:

Usage Per Capita in GPD:	54.3
Usage Per Account (Customer) in GPD:	159.5
Usage Per 5/8" Meter Equivalent in GPD:	158.0

Multi-Family Residential Users Average Daily Water Use For Class: 0.0115 MGD

	Number of Customers By Meter Size									Totals
	5/8"	3/4"	1"	1.5"	2"	3"	4"	6"	8"	
# Accounts (Customers)			8	2	6					16
# Meters			8	2	6					16
Ratio	1	1.5	2.5	5	8	15	25	50	80	
Total Meter Equivalents	0.0	0.0	20.0	10.0	48.0	0.0	0.0	0.0	0.0	78.0

Multi-Family Residential Class Usage Factors:

Usage Per Capita in GPD:	0.2
Usage Per Account (Customer) in GPD:	718.8
Usage Per 5/8" Meter Equivalent in GPD:	147.4

Commercial Users Average Daily Water Use For Class: 0.1300 MGD

	Number of Customers By Meter Size									Totals
	5/8"	3/4"	1"	1.5"	2"	3"	4"	6"	8"	
# Accounts (Customers)	68		4		10					82
# Meters	68		4		10					82
Ratio	1	1.5	2.5	5	8	15	25	50	80	
Total Meter Equivalents	68.0	0.0	10.0	0.0	80.0	0.0	0.0	0.0	0.0	158.0

Commercial Class Usage Factors:

Usage Per Capita in GPD:	2.1
Usage Per Account (Customer) in GPD:	1,585.4
Usage Per 5/8" Meter Equivalent in GPD:	822.8

Industrial Users Average Daily Water Use For Class: 0.0000 MGD

	Number of Customers By Meter Size									Totals
	5/8"	3/4"	1"	1.5"	2"	3"	4"	6"	8"	
# Accounts (Customers)										0
# Meters										0
Ratio	1	1.5	2.5	5	8	15	25	50	80	
Total Meter Equivalents	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Industrial Class Usage Factors:

Usage Per Capita in GPD:	0.0
Usage Per Account (Customer) in GPD:	#DIV/0!

SECTION II. CONSERVATION & DEMAND MANAGEMENT

1. Water Shortage Ordinance (Attachment I.)

Harnett County established a water shortage ordinance in 1992. The purpose of the ordinance was to conserve water by controlling residential outdoor use. Since inception the County has enacted the ordinance three times during three different years. The ordinance was in effect from May through September when outdoor use is highest. The program allows watering for each customer twice per week. The location of the residence (geographic area) determines which days watering is allowed.

2. Conservation Rate Structure (Attachment II.)

Harnett County Utilities a flat rate structure. Residential customers pay $13.10 for the first two thousand gallons and $3.20 for each subsequent thousand gallons. Commercial customers pay $17.00 per month plus $2.55 per thousand over two thousand gallons. Institutional customers pay $1.55 per thousand based on minimum usage of 525,000 gallons per month.

3. Leak Detection and Repair (Attachment III.)

During fiscal year 1999-2000, Harnett County Utilities repaired a total of 163 leaks. This amount of leaks equals 978 total billable man-hours. Repaired leaks require three technicians, one dump truck, one trailer, one backhoe and one service truck. The leaks are logged in the "Daily Log Report." This report is used monthly to update maintenance reports. The maintenance report is used to generate reports on:

1. Water Loss
2. Overtime
3. Water Quality
4. Equipment Hours

Harnett County Utilities currently uses Auto CAD Map to digitize all our "As-builts." Currently 50% of the water system is digitized. Our goal is to increase digitalization 10% annually until 100% complete. When completed, our infrastructure including all meters, valves and hydrants will be plotted within a centimeter accuracy. Harnett County also employees a Water Quality Technician. It is the responsibility of this individual to help maintain and report water quality in the distribution system. Our technician is trained to look for leaks when traveling throughout the County. The departments meter readers also look for leaks when reading meters. This occurs approximately 20 days per month.

The Water Operations Division also monitors for leaks with the system SCADA System. The operator will look specifically at demand trends over times as long as day or as short as five minutes and compare to past trends with similar conditions. The operator and SCADA system are also equipped with suction and discharge pressure gauges at each of our fourteen booster pump stations. The operator can find a sizeable leak by comparing pressure readings at the station and elevated tank levels.

4. Annual Water Audits (Attachment IV.)

Water loss reduction objectives are set at 10% maximum loss for the year. Over the last five years the department has reduced the overall distribution loss from 19.3% to last years total of 9.7 %. This year's loss (enclosed) exceeded 10% due to water plant piloting studies. During the pilot study it was possible to waste as much as 3 mgd to maintain 6 gpm/ft. in our filters. This pilot program was endorsed and monitored by the North Carolina Public Water Supply Section.

5. Public Education Program (Attachment V.)

Harnett County realized the need for a public education program when it became necessary to facilitate a conservation ordinance. Since 1992 we have sent out mailing from AWWA and NRWA providing tips on outdoor water use. The water plant actively encourages schools to visit our facilities. Tour groups such as schools are always given water saving fact sheets when visiting our facilities. Harnett County has also established a web site for our customers. Besides billing information there are numerous water saving tips for the consumer.

6. Plumbing Retro-Fit Program

The County does not have a program in place at this time. It has been noticed by our department head of other utilities utilizing this program. Discussions have been held in recent staff meetings. The issue has been tabled until the January 2001 staff meeting.

7. Evaluation of Water Re-Use

Harnett County is fortunate to own elaborate and sophisticated water utility. Our wastewater endeavors have moved at a slower pace. The County tried to work an agreement with the Carolina Lakes golf course in the early 1990's to use effluent from our .300 mgd spray irrigation facility located at Carolina Lakes. The golf course was interested, but the County could not produce enough effluent to make the project viable. In the next decade more efforts will be put into water re-use. The County has purchased the Town of Lillington Wastewater Treatment Plant, as a County Regional Facility. As the collection system and plant expand water Re-use will become more feasible. Immediate plans include using a portion of the effluent at the Lillington Plant to develop a tree farm for beautification at all of Harnett County government complexes.

SECTION III. CURRENT WATER SUPPLY

Section III. Current Water Supply

Harnett County currently draws water through a run of the river source located approximately 1,000 feet upstream of the Lillington gauging station on the main stem of the Cape Fear River. Following are pertinent statistics of river flow at the Lillington gauge.

Mean Annual Discharge	3,504 cfs
10% Exceedence Flow	10,700 cfs
50% Exceedence Flow	1,310 cfs
90% Exceedence Flow	619 cfs
7Q10	530 cfs
Low flow of record (since 1982)	210 cfs

While there is currently a work group evaluating the run of river supply of the Cape Fear River below the dam, the basic policy of the North Carolina Division of Water Resources and the North Carolina Division of Environmental Health for run of river water supply to limit the supply to the lower of either 20 percent of the 7Q10 flow or the minimum flow of record. Twenty percent of the regulated 7Q10 is 69 mgd, therefore be used as the maximum in-stream withdrawal allowable during low flow conditions. In a letter dated December 6, 2000 to John Morris of the Division of Water Resources, Rodney Tart of Harnett County requested confirmation of their understanding of the withdrawal limits; i.e, maximum withdrawal amount will be limited to 50 cfs (32 mgd). Accordingly, the Water Supply Plan included as a part of this application includes an analysis for both 32 mgd and 69 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		
Cape Fear	3600	Y	Cape Fear (2-3)	7.37	365	12	32	T	12	R	N/A	R
PLAN HIGH RATE												
TO 18MGD SUMMER												
							32	Totals	12			

NOTES Column 7 Supply Qualifiers: **C**=Contract amount, **SY20**=20-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? 12 MGD

3-C. Does this system have off-stream raw water supply storage? ☐ No ☒ Yes Useable Capacity 60.7 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) Inches	5* R or E
Water System	PWSID	MGD	# of Days	MGD	Expiration Date		
Johnston County	03-51-070	3.90	365	N/A	Perpetual	12	E
Dunn	03-43-010	2.00	365	2.5	Perpetual	6	E
Erwin	03-43-035	0.75	365	1.0	Perpetual	6	E
Fuquay Varina	03-92-055	1.30	365	1.3	02-23-2029	12	E
Holly Springs	03-92-050	1.00	365	1.0	01-01-2041	12	E
Smithfield	03-51-010	1.00	365	N/A		12	E
Apex	03-92-045	1.00	365	N/A		12	E
Raleigh	03-92-010	2.00	365	N/A		12	E
Cary	03-92-040	1.00	365	N/A		12	E

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

3-E. What is the Total Amount of Purchase Contracts available for Regular Use? 0.0 MGD (Do not include emergency use connections in total)

SECTION IV. FUTURE WATER SUPPLY NEEDS

Section IV. Future Water Supply Needs

Future water supply needs are analyzed in three ways. First using the Round Three Lake Jordan Allocation rules, water needs are determined using the average day demand. The current withdrawal allocation from the river of 32 mgd. The second compares the projected maximum day demand to the current allocated withdrawal from the river. Finally, the water supply available from the Cape Fear River is estimated using the current policy of the Division of Water Resources citing that the available water supply from a run of river source is equal to 20 percent of the 7Q10. The data in each of these analyses is displayed in the worksheet, both in tabular and in graph form.

As discussed previously, the projected demands for the Harnett County system for the year 2050 are for an average day demand of 33.77 mgd and a maximum day demand of 50.66. The current allocation from the river is 32 mgd. Referring to the daily demand chart in the accompanying worksheet, one can see that the intersection of the supply and demand curves for an average day occurs around the year 2048. At the end of the planning period, there is a deficit of 1.77 mgd. Similarly using the maximum day demand curve, the point of intersection of supply and demand occurs around the year 2033. By the end of the planning period, the maximum day demand exceeds the supply by 18.66 mgd.

The same chart displays the available supply of 69 mgd. The basic policy of the Division of Water Resources is utilized estimating the maximum withdrawal at low flow conditions to 20 percent of the 7Q10. If this policy is in effect, then there will be a surplus of water available to Harnett County at the end of the planning period amounting to 35 mgd and 18 mgd on an average day or maximum day basic respectively. The analysis of this data returns Harnett County to the same position and considerations that were present in their original requests to the Division of Water Resources in the Spring of 1997. That is if a State is going to adopt its basic policy of run of river intakes for non-regulated streams and allow its application on the Cape Fear River, then no allocation from Lake Jordan would be necessary for this planning period. The major issue to be resolved is the use of water quality pool water for drinking water purposes prior to the gauging station at Lillington. It would seem reasonable since the gauging station is so close to the intake at Lillington, that the amount of water withdrawn from the river by Harnett County be counted as a part of the gauged water at

Lillington. The withdrawal can be relayed to the Corps of Engineers to be added to the stream gauge to meet the 600 cfs target goal.

In the absence of a favorable decision in this regard, Harnett County has no option but to request a Level II Allocation from Lake Jordan.

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)	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
(2) Existing Ground Water Supply (Item 3-G)	0	0	0	0	0	0	0	0	0	0	0
(3) Existing Purchase Contracts (Item 3-E)	0	0	0	0	0	0	0	0	0	0	0
(4) Future Supplies (Item 7-E)	0	0	0	0	0	0	0	0	0	0	0
(5) **Total Available Supply** [sum (1) thru (4)]	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
Average Daily Demand, MGD											
(6) Service Area Demand (Item 7-B, Line 7)	6.446	6.376	7.655	8.699	9.885	11.234	12.766	14.507	16.485	18.733	21.288
(7) Existing Sales Contracts (Item 2-H)	0.720	1.03	1.33	1.79	2.22	3.05	3.87	4.85	6.29	7.02	7.74
(8) Future Sales Contracts (Item 7-G)	0.200	0.350	1.430	2.040	2.650	2.950	3.250	3.500	3.750	4.250	4.750
(9) **Total Average Daily Demand** [sum (6) thru (8)]	7.37	8.89	10.41	12.583	14.76	17.32	19.88	23.20	26.52	30.15	33.77
(10) Demand as Percent of Supply [(9) / (5)] x 100	23.03	27.78	32.53	39.31	46.19	54.13	62.13	72.50	82.88	94.22	105.55
(11) **Supply Needed to maintain 80% (5)** **[(9) / 0.8] -**	0	0	0	0	0	0	0	0	0.92	4.55	8.17
Additional Information for Jordan Lake Allocation											

SYSTEM NAME HARNETT COUNTY PUBLIC UTILITIES PWSID 03-43-045

Available Supply, MGD	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
(12) Sales Under Existing Contracts	0.72	1.03	1.33	1.79	2.22	3.05	3.87	4.85	6.29	7.02	7.74
(13) Expected Sales Under Future Contracts	0.20	0.350	1.43	2.04	2.65	2.95	3.25	3.50	3.75	4.25	4.75
(14) Demand in each planning period [(6)+(12)+(13)]	7.37	8.89	10.41	12.583	14.76	17.32	19.88	23.20	26.52	30.15	33.77
(15) Supply minus Demand [(5) - (14)]	24.63	23.11	21.59	19.42	17.24	14.68	12.12	8.80	5.48	1.85	-1.77

8-B. Does Line 10 above indicate that demand will exceed 80% of available supply before the year 2030? ☐ No **X** Yes
If yes, your Jordan Lake Water Supply Storage Allocation Application should include the following items:

(1) Alternatives for obtaining additional water supply to meet future demands. Use the following tables to summarize the various future water supply alternatives available to your system. Attach a detailed description of each water supply project shown in each alternative. 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. A program should include: conducting water audits at least annually 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.

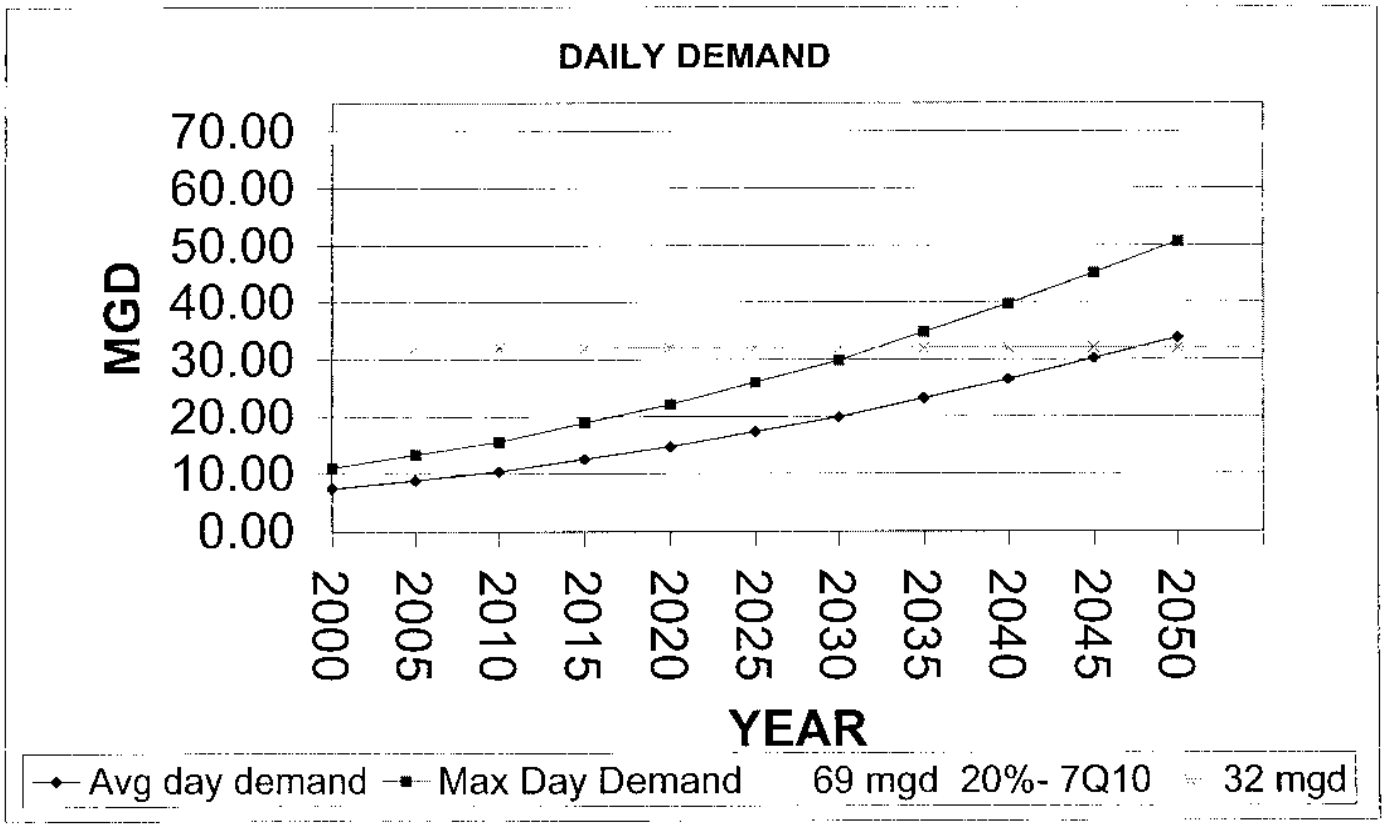
(3) Restrictive measures to control demand if the additional supply is not available when demand exceeds 80% of available supply, such as placing a moratorium on additional water connections until the additional supply is available or amending or developing your water shortage response ordinance to trigger mandatory water conservation as water demand approaches 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"	24.63	23.11	21.59	19.42	17.24	14.68	12.12	8.80	5.48	1.85	-1.77
(2) Available supply from Project 1 (describe)											
Available supply from Project 2 (describe)											
Available supply from Project 3 (describe)											
(3) Supply available for future needs [(1) + (2)]											
(4) Total discharge to Source Basin											

D. AVERAGE DAILY DEMAND, MGD

	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Service Area Demand (item B)	6.446	6.736	7.655	8.699	9.885	11.234	12.766	14.507	16.485	18.733	21.288
Sales Contracts (item C)	0.72	1.03	1.33	1.79	2.22	3.05	3.87	4.85	6.29	7.02	7.74
Future Sales Contracts (item C)	0.20	0.35	1.43	2.04	2.65	2.95	3.25	3.50	3.75	4.25	4.75
Total Average Daily Demand	7.37	8.89	10.41	12.58	14.76	17.32	19.88	23.20	26.52	30.15	33.77
Maximun Day Demand	11.05	13.33	15.61	18.87	22.13	25.98	29.82	34.80	39.78	45.22	50.66



SECTION V. ALTERNATIVE WATER SUPPLIES

Section V. Alternative Water Supplies

Alternative water supply sources have been evaluated in a brainstorming session with The Wooten Company and Harnett County staff. The alternatives considered are listed on the attached evaluation sheet with comments included in each of the attributes as requested in the Lake Jordan Allocation guidelines. Due to the discussion of water supply source as presented in the previous section, a detailed cost evaluation of the alternatives was not completed. Two of the alternatives, however, are worthy of additional consideration if the run of river source is not adequate. The first would be the utilization of quarries for off-stream storage by stream flow augmentation. The other alternative would be the development of a new reservoir up-stream of the Lillington intake.

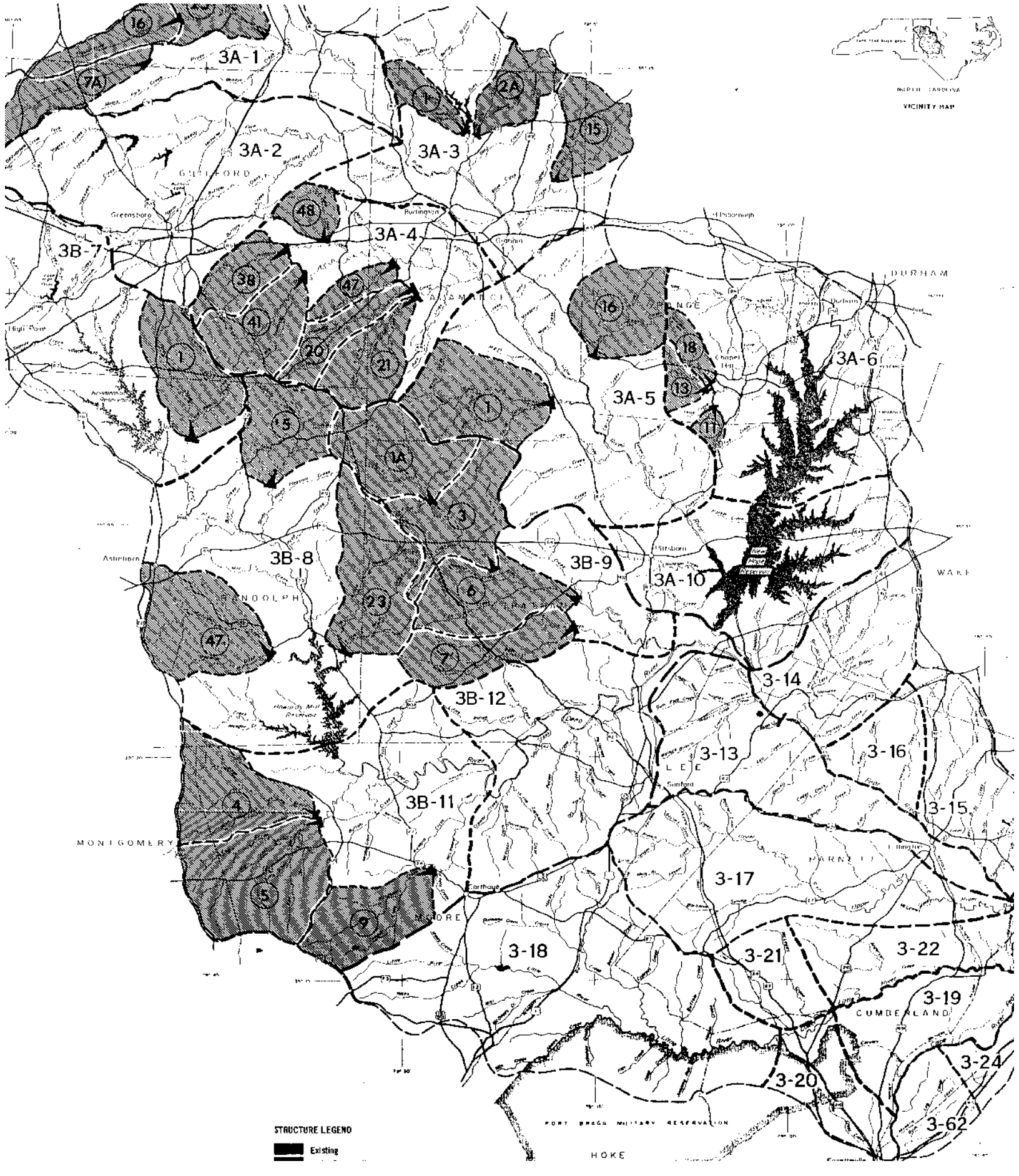
Off-stream storage is considered a viable alternative due to the close proximity of the intensive quarry operations to the water plant. South of Lillington is a major quarry that is still in production. Discussions with the quarry operators indicate that they expect that the quarry will continue to yield economical production for the company forty plus years into the future. Accordingly, as we approach year 2020 to 2025 serious discussions should be underway with the quarry operators to make a determination as to the suitable of this for flow augmentation.

With respect to the construction of a dam on the Cape Fear River, the North Carolina Water Plan Progress Report, Chapter 27 – Cape Fear River Basin, Volume 1 dated January 1972, was reviewed. In that report, the results of the analysis of a number of dam sites on the Deep River were presented. Assuming the worst case scenario of having to develop a safe to yield of 18 mgd and utilizing the detailed design cost data presented in the aforementioned study, we believe that a suitable site would require a drainage area of between 100 and 150 square miles. A combination of dam Sites Four and Five located in western Moore County will have a total drainage area of 129 square miles. Based upon the analysis prepared by the Corps of Engineers on these sites, the dams would impound approximately 16,800 acre feet of storage over approximately 1,300 acre reservoir. The total estimated cost in todays dollars is approximately $15,000,000. Copies of the detailed design data prepared by the Corps is attached herewith.

Round 3 - Lake Jordan Alternatives Evaluation
County of Harnett

	Well Field #3	Acquire Existing Hydro Power Dam	Off Stream Storage	Dam Little River	River Bank Collection Wells
Available Supply	Insufficient	Insufficient	unknown	18 mgd	18 mgd
Environmental Impact	Same	Worse	Better	Worse	Same
Water Quality Classification	None	No Change	WS4	WS4	None
Timeliness	5-7 years	10 years	10/50 years*	25-40 years	8-10 years
Interbasin Transfer	None	None	None	Yes	None
Regional Partnerships	None	Yes	None	Yes	None
Technical Complexity	Complex	Very Complex	Complex	Very Complex	Complex
Institutional Complexity	Complex	Very Complex	Complex	Very Complex	Complex
Political Complexity	Complex	Very Complex	Not Complex	Very Complex	Not Complex
Public Benefits	None	None	Few	Many	None
Consistency with Local Plans	Not Consistent	Not Consistent	Consistent	**	Consistent
Cost			****	$15,000,000 ***	****

*Preliminary discussions with mine officers indicate that the larger, more desirable, mine will not be available to use for 40 years. Some smaller sites are available now.
**Consistent with local plans, but not consistent with regional plans.
*** dam sites 4&5in Moore County
**** Needs further investigation



3A-1
3A-2
3A-3
3A-4
3A-5
3A-6
3B-7
3B-8
3B-9
3A-10
3B-11
3B-12
3-13
3-14
3-15
3-16
3-17
3-18
3-19
3-20
3-21
3-22
3-24
3-62
GUILFORD
DURHAM
WAKE
RANDOLPH
MONTGOMERY
MOORE
LEE
CUMBERLAND
HOKE
Greensboro
Burlington
Durham
Chapel Hill
Pittsboro
Asheboro
Sanford
Carthage
Fort Bragg Military Reservation
VICINITY MAP
STRUCTURE LEGEND
Existing

DETAILED DESIGN/. TABLE NO.3
KEY SITE ATA

TITLE- CAPE FEAR STRUCTURE SITES 3811
TITLE- MOORE CO. SITE-4

STATE - NORTH CAROLINA REGION - NORTH CAROLINA 2I SITE NAME - SITE-4

REMARKS * CLASS B * REMARKS
REMARKS * MULTIPLE PURPOSE STRUCTURE * REMARKS
REMARKS * CAPE FEAR * REMARKS

WATER-IMPOUNDING STRUCTURE DESIGN AND COST TABLE

ELEVATION MSL				HGT DAM FT	STORAGE AC-FT				SURFACE AREA AC.	FILL (1000 YD.)	INSTALLATION COST $1000					UNIT COST $ PER UNIT		
NORM POOL	EMER SPWY CREST	DSGN HIGH WATER	TOP OF DAM	MAX HGT	BEN USE	NORM POOL	TEMP FLOOD	TOTAL EMER SPWY CREST	NORM POOL	DSGN HIGH WTR	VOL	CONST	ENGR ADM	L/R	PROJ	TOTAL	PER AC-FT TOTAL STORE	PER ACRE NORM SURF	PER AC-FT BEN STORE
DRAINAGE AREA - 52.50 SQ.MI. ELEVATION BOTTOM C/L PROFILE - 322.80 MSL																		
SINGLE DEVELOPMENT																		
382	395	398	404	81	2380	6200	9500	18500	590	1090	197	1355	108	500	187	2150	116	3644	347

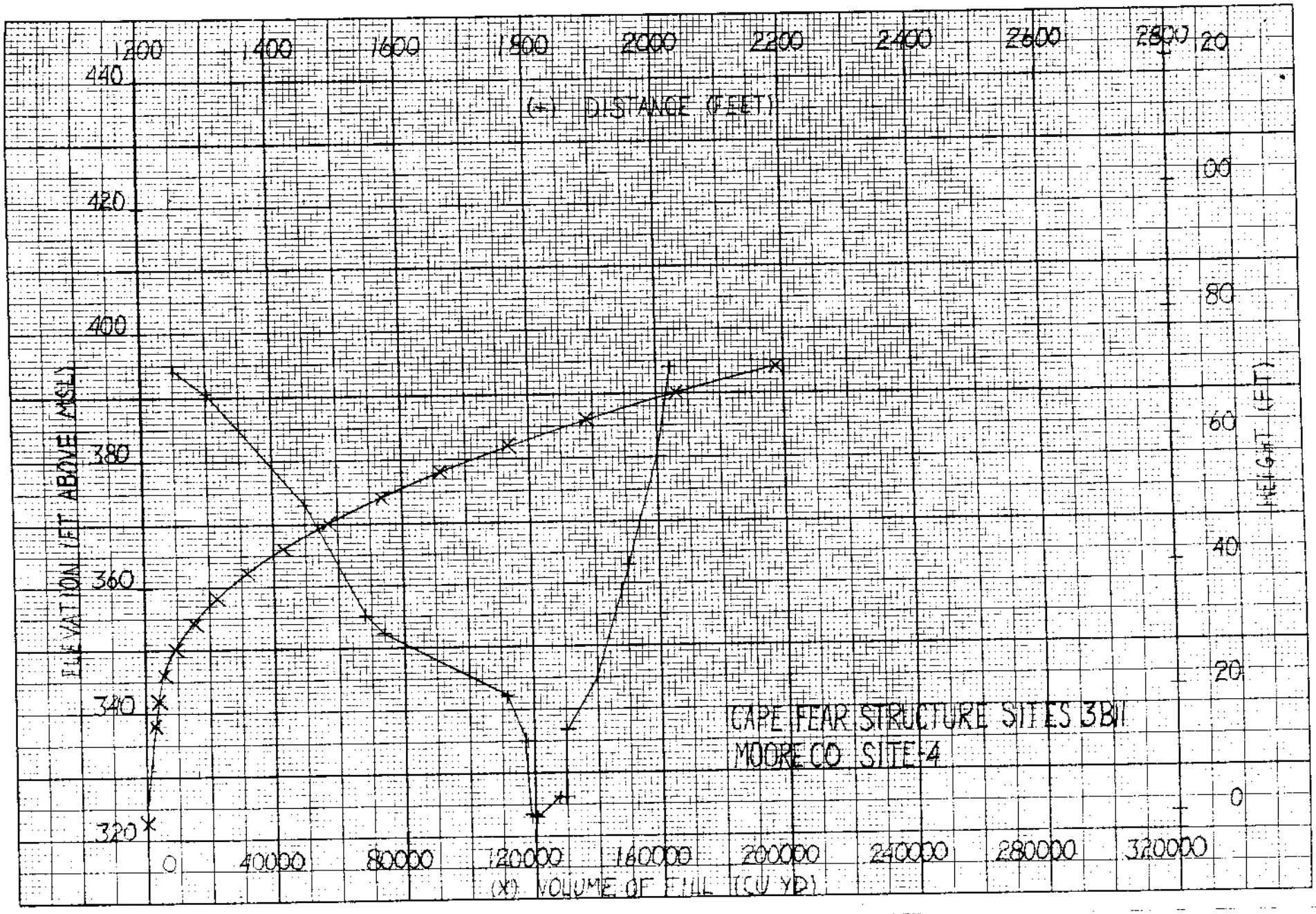
NOTES- (1) TABLE VALUES WERE DEVELOPED TO ASSIST THE ENGINEER TO COMPARE-
(A) ALTERNATE DEVELOPMENTS WITHIN THIS SITE LOCATION
(B) ALTERNATE LOCATIONS THIS SITE
(C) ALTERNATE SITES FOR SIMILAR DEVELOPMENTS
(2) TABLE VALUES ARE NOT MEANT TO BE USED AS A SUBSITUTE FOR FINAL DESIGN. USE THE TABLE FOR THE FINAL SELECTION, THEN MAKE AN INDEPENDENT ANALYSIS TO VERIFY SELECTION.

DETAILED DESIGN/COST TABLE NO. 4
MISC. DESIGN DATA

TITLE- CAPE FEAR STRUCTURE SITES 3B11
TITLE- MOORE CO. SITE-4

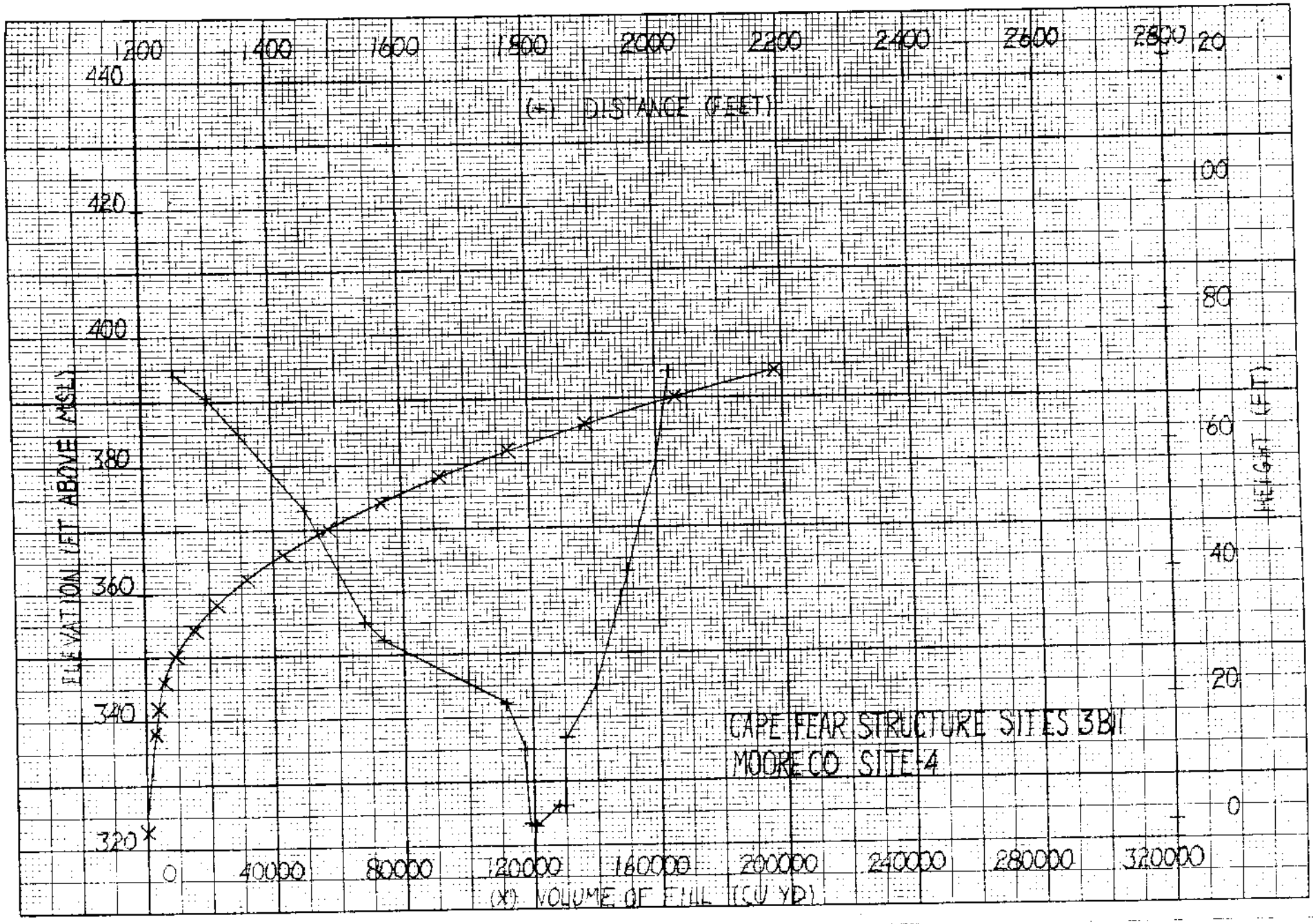
LEVEL OF DEV. AF	GROSS MEAN ANNUAL YIELD - CFS PERCENT CHANCE OF SHORTAGE			
	1.0	2.0	10.0	25
SD 6200	18.257	20.808	28.400	37.442

NO. 340R-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH
EUGENE DIETZGEN CO.
MADE IN U. S. A.



NO. 340R-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH

EUGENE DIETZGEN CO.
MADE IN U. S. A.



DETAILED DESIGN/COST TABLE NO.3
KEY SITE DATA

TITLE- CAPE FEAR STRUCTURE SITES 3811
TITLE- MOORE CO. SITE-5

STATE - NORTH CAROLINA REGION - NORTH CAROLINA 21 SITE NAME - SITE-5

REMARKS * CLASS B * REMARKS
REMARKS * MULTIPLE PURPOSE STRUCTURE * REMARKS
REMARKS * CAPE FEAR * REMARKS

WATER-IMPOUNDING STRUCTURE DESIGN AND COST TABLE

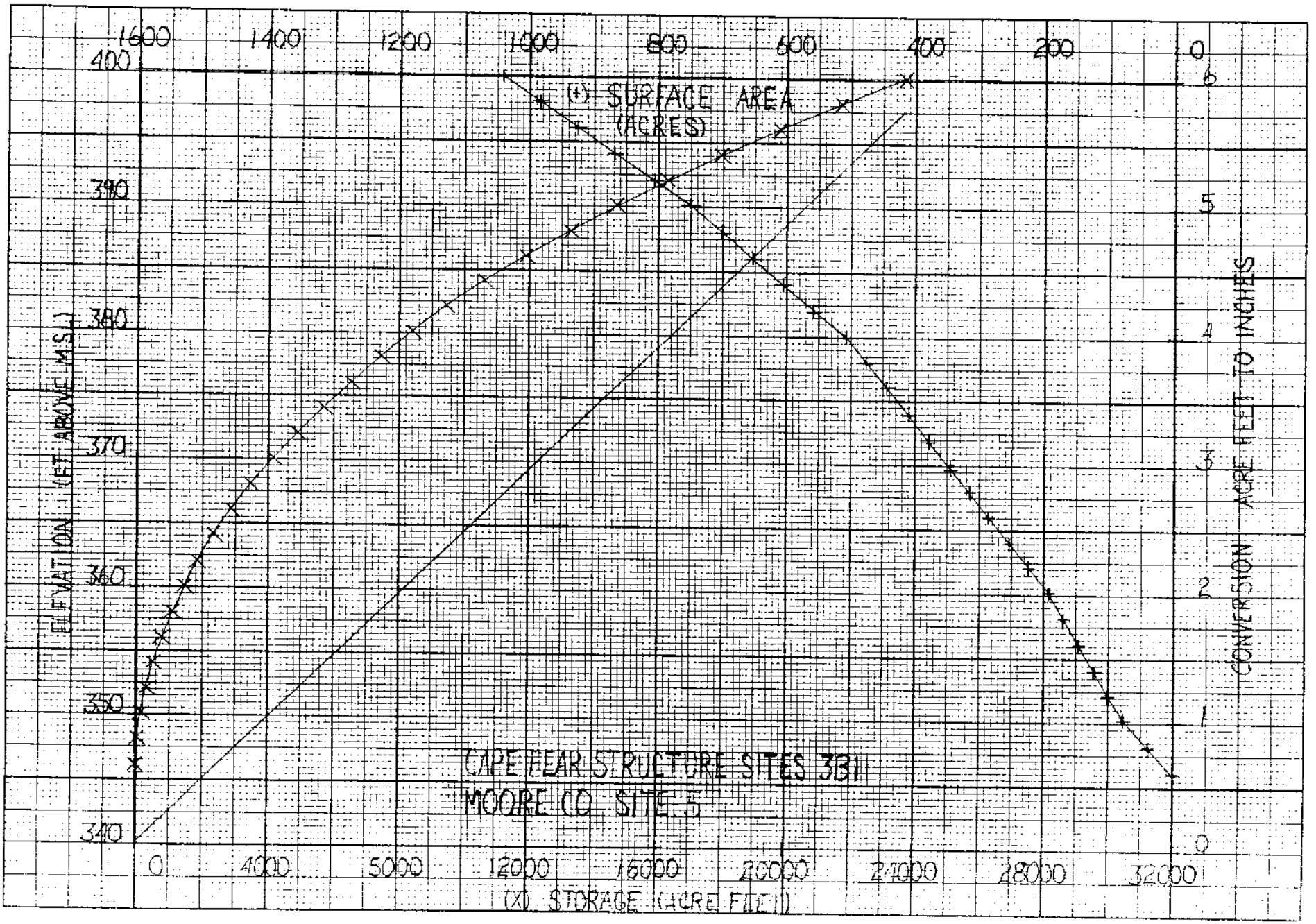
ELEVATION MSL				*HGT *DAM *FT	STORAGE AC-FT				SURFACE AREA AC.	FILL *(1000* YD.)*	INSTALLATION COST $1000				UNIT COST $ PER UNIT		
NORM POOL	EMER SPWY CREST	DSGN HIGH WATER	TOP OF DAM	*MAX HGT	BEN USE	NORM POOL	TEMP FLOOD	TOTAL EMER SPWY CREST	NORM POOL	DSGN HIGH WTR	VOL	CONST	ENGR ADM	L/R	PROJ TOTAL	PER *AC-FT TOTAL STORE	PER ACRE NORM SURF	PER AC-FT BEN STORE
DRAINAGE AREA - 77.10 SQ.MI. ELEVATION BOTTOM C/L PROFILE - 329.50 MSL																	
											SINGLE DEVELOPMENT						
390	390	395	400	60	3494	10590	0	14700	750	880	263	1355	108	500	187	2150	146	2867	203

NOTES- (1) TABLE VALUES WERE DEVELOPED TO ASSIST THE ENGINEER TO COMPARE-
(A) ALTERNATE DEVELOPMENTS WITHIN THIS SITE LOCATION
(B) ALTERNATE LOCATIONS THIS SITE
(C) ALTERNATE SITES FOR SIMILAR DEVELOPMENTS
(2) TABLE VALUES ARE NOT MEANT TO BE USED AS A SUBSTITUTE FOR FINAL DESIGN. USE THE TABLE FOR THE FINAL SELECTION, THEN MAKE AN INDEPENDENT ANALYSIS TO VERIFY SELECTION.

DETAILED DESIGN/COST TABLE NO. 4
MISC. DESIGN DATA

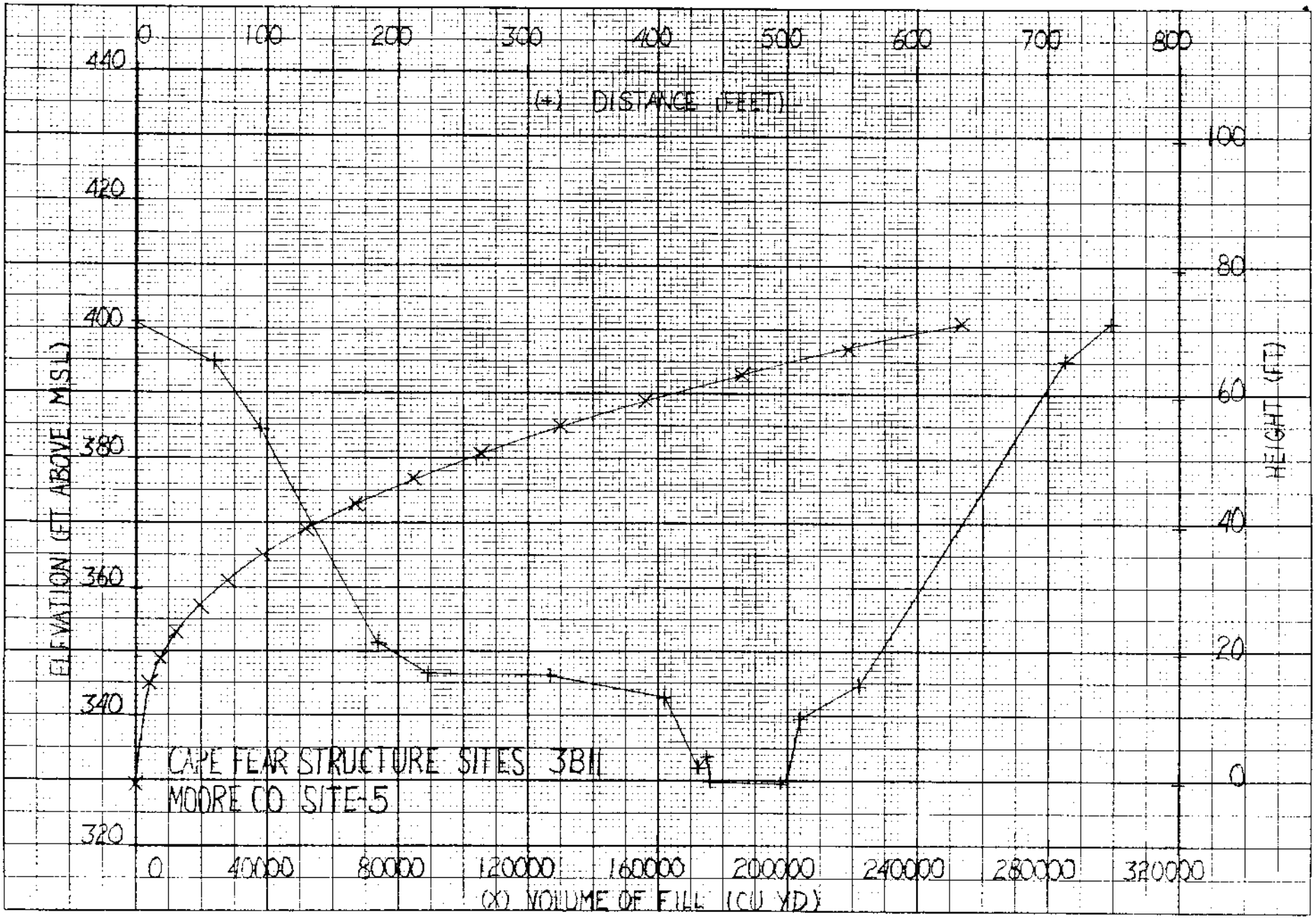
TITLE- CAPE FEAR STRUCTURE SITES 3B11
TITLE- MOORE CO. SITE-5

LEVEL OF DEV. AF	GROSS MEAN ANNUAL YIELD - CFS PERCENT CHANCE OF SHORTAGE 1.0	2.0	10.0	25
SD 10590	29.706	33.622	45.198	59.157


1600
1400
1200
1000
800
600
400
200
0
400
390
380
370
360
350
340
(+) SURFACE AREA (ACRES)
ELEVATION (FT ABOVE M.S.L.)
CONVERSION - ACRE FEET TO INCHES
6
5
4
3
2
1
0
CAPE FEAR STRUCTURE SITES 36 II
MOORE CO. SITE 5
0
4000
8000
12000
16000
20000
24000
28000
32000
(X) STORAGE (ACRE FEET)

NO. 340R-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH

EUGENE DIETZGEN CO.
MADE IN U.S.A.



SECTION VI. PLANS TO USE JORDAN LAKE

Section VI. Plans to Use Lake Jordan

Under current Lake Operational rules, Harnett County will notify the Corps Office of the next day projected water system demand. The Corps would then add this demand to the amount of water needed to maintain the minimum target flow at Lillington and recall the additional water. Harnett County will then pump the released water from the river for treatment.

ATTACHMENTS

Attachment I.	Water Ordinance
Attachment II.	Rate Structure
Attachment III.	Leak Detection and Repair
Attachment IV.	Annual Water Audit
Attachment V.	Public Education
Attachment VI.	2000 Water Supply Plan Water Use Calculations Water Balance Tables

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 **Gary Averitte** Date: **May 24, 2001**

SECTION 1: GENERAL INFORMATION

1-A. Water System: **Harnett County Department of Public Utilities** 1-B. PWS Identification #: **03-43-045**

1-C. River Sub-Basin(s): **Cape Fear 2-3** **Neuse (10-1)**

1-D. County(s): **Harnett, Wake, Cumberland, Johnston, Moore**

1-E. Contact Person: **Gary Averitte** Title: **Water Resources Manager**

1-F. Mailing Address: **PO Box 1119** CITY **Lillington** ZIP **27546**

1-G. Phone: **910-893-7575** 1-H. Fax: **910-893-3246** 1-I. E-mail: **Gaveritte@Harnett.** org

1-J. Type of Ownership (Check One): F Municipality X 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 **66,097**

Seasonal (if applicable) _____ For Months of _____

2-B. Total Water Use for 2000 including all purchased water: **2462.12** Million Gallons (MG)

2-C. Average Annual Daily Water Use in 2000: **7.37** Million Gallons per Day (MGD)

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

LILLINGTON, COATS, ANGIER ARE INCLUDED IN RESIDENTIAL, INDUSTRIAL, INSTITUTIONAL...SEE WORKSHEET

	Metered Connections		Non-Metered Connections		Total
Type of Use	Number	Average Use (MGD)	Number	Estimated Average Use (MGD)	Average Use (MGD)
(1) Residential	25421	4.08			4.08
(2) Commercial	82	0.19			0.19
(3) Industrial					
(4) Institutional	16	0.286			0.286
(5) Sales to other Systems					0.92
(6) System Processes					0.89
(7) Subtotal [sum (1) thru (6)]					6.37
(8) Average Annual Daily Water Use [Item 2-C]					7.37
(9) Unaccounted-for water [(8) - (7)]					1.00

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	5.83	8.00	1.51	May	8.30	11.00	1.33	Sep	6.67	8.35	1.25
Feb	7.17	9.00	1.25	Jun	7.78	10.00	1.25	Oct	9.21	9.70	1.07
Mar	6.63	9.00	1.38	Jul	9.00	9.00	1.00	Nov	6.86	7.50	1.20
Apr	6.24	7.56	1.21	Aug	7.12	8.29	1.16	Dec	6.49	8.00	1.23

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
Fuquay Varina	0.550	Woodlake	0.093
Lillington	0.362	Linden	0.080
Angier	0.315	Riverside	0.040
Holly Springs	0.243		
Coats	0.206		

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*
Water System	PWSID	MGD	# of Days	MGD	Expiration Date	Inches	R or E
Fuquay Varina	03-43-025	0.550	365	1.30		12	R
Lillington	03-92-055	0.362	365	2.00	04-15-2017	16	R
Angier	03-43-015	0.315	365	2.02	Perpetual	16	R
Coats	03-43-020	0.206	365	0.72	Perpetual	12	R
Linden	03-26-045	0.080	365	0.25	Perpetual	6	R
Woodlake	03-63-114	0.093	365	0.14		6	R
Holly Springs	03-92-050	0.243	365	1.00	01-01-2041	12	R
Dunn	03-43-010	0.00	0	2.50	Perpetual	6	E
Erwin	03-43-035	0.00	0	1.00	Perpetual	6	E
Johnston County	03-51-070	0.00	0	N/A	Perpetual	12	E

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

2-H. What is the Total Amount of Sales Contracts for Regular Use? 1.69 MGD

SYSTEM NAME Harnett County Public Utilities PWSID 03-43-045

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		
Cape Fear	3600	Y	Cape Fear (2-3)	7.37	365	12	32	T	12	R	N/A	R
PLAN HIGH RATE												
TO 18MGD SUMMER												
							32	Totals	12			

NOTES Column 7 Supply Qualifiers: **C**=Contract amount, **SY20**=20-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? 12 MGD

3-C. Does this system have off-stream raw water supply storage? F No **X** Yes Useable Capacity 60.7 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*
Water System	PWSID	MGD	# of Days	MGD	Expiration Date	Inches	R or E
Johnston County	03-51-070	3.90	365	N/A	Perpetual	12	E
Dunn	03-43-010	2.00	365	2.5	Perpetual	6	E
Erwin	03-43-035	0.75	365	1.0	Perpetual	6	E
Fuquay Varina	03-92-055	1.30	365	1.3	02-23-2029	12	E
Holly Springs	03-92-050	1.00	365	1.0	01-01-2041	12	E
Smithfield	03-51-010	1.00	365	N/A		12	E
Apex	03-92-045	1.00	365	N/A		12	E
Raleigh	03-92-010	2.00	365	N/A		12	E
Cary	03-92-040	1.00	365	N/A		12	E

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

3-E. What is the Total Amount of Purchase Contracts available for Regular Use? 0.0 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
N/A														

***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? _____ million gallons

3-H. Are ground water levels monitored? F No F Yes How often? _____

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

SYSTEM NAME Harnett County Public Utilities PWSID 03-43-045

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)
Harnett County Regional Water Treatment Facility	12.0	Cape Fear River

3-K. What is the system's finished water storage capacity? **23.80** 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		Average Daily Discharge		Average Daily Discharge		Average Daily Discharge
Jan	0.500	Apr	0.566	Jul	0.411	Oct	0.533
Fe	0.639	May	0.431	Aug	0.522	Nov	0.457
Mar	0.540	Jun	0.396	Sep	0.583	Dec	0.477

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
NC0030091	0.500	0.500	0.499	Cape Fear	Cape Fear (2-3)	0.600
NC0007684	N/A	0.080		Cape Fear	Cape Fear (2-3)	0.600
WQ0002994	0.300	N/A		Spray Irrigation	N/A	N/A
NC0031470	0.400	0.400	0.088	Jumping Run Creek	Cape Fear (2-3)	0.125

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
Bunnlevel-Riverside W/S	N/A	Town of Erwin	NC0064521	0.050	365	0.100

4-D. Number of sewer service connections: **3475**

4-E. Number of water service connections with septic systems: **17000** (Number in Sub-basin 1 ____ Number in Sub-basin 2 ____ Number in Sub-basin 3 ____)

4-F. Are there plans to build or expand wastewater treatment facilities in the next 10 years? F No **X** Yes Please explain. The County is looking at regionalization of the Town of Lillington WWTP in lieu of expansion. The County has purchased (Year 2000) and is operating a 0.400 surface discharge plant from Rolling Hills Water, in Anderson Creek.

SECTION 5: WATER CONSERVATION and DEMAND MANAGEMENT ACTIVITIES

5-A. What is the estimated total miles of distribution system lines? **1875** 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	6-16"		16-20"		2-16"	
Estimated % of lines	1		5		94	

5-C. Were any lines replaced in 2000? **X** No F Yes _____ linear feet

5-D. Were any new water mains added in 2000? F No **X**Yes **27100** linear feet

5-E. Does this system have a program to work or flush hydrants? F No **X**Yes How often? **Daily**

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

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

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

5-I. Does this system have a leak detection program? X No F Yes What type of equipment or methods are used? _____

5-J. Has water use ever been restricted since 1992? F NoX Yes Please explain. Irrigation was restricted. A rotation system was used to limit water use.

5-K. Does this system have a water conservation plan? X No F Yes Please attach a copy.

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

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

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

5-P. Is raw water metered? F No X Yes

5-Q. Is finished water output metered? F No X Yes

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

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

5-T. How old are the oldest meters in the system? 23 years

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

Attach a detailed description of the rate structure to this document.

5-V. Are there meters for outdoor water use, such as irrigation, which are not billed for sewer services? F No F Yes # of meters 93

5-W. Does this system use reclaimed water or plan to use it within the next five years? X No F Yes # of connections _____ ; _____ 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.

4/2001

13-045

2050

237,374

2050

14.717

0.57

1.291

1.766

2.940

21.288

LOCAL WATER SUPPLY PLAN for JORDAN LAKE ALLOCATION APPLICATION 2000-2001
Part 2: Water Supply Planning Report

Completed By: **Gary Averitte** Date: **05/2**

WATER SYSTEM: **Harnett County Department of Public Utilities// Harnett County Regional Water System** PWSID: **03-4**

SECTION 7: WATER DEMAND PROJECTIONS

7-A. Population to be Served

	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045
Year-Round	**66,097**	**75,112**	**85,356**	**96,997**	**110,226**	**125,259**	**142,342**	**161,755**	**183,816**	**208,885**
Seasonal (if applicable)*										

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

***HARNETT CO. POPULATION LESS ERWIN AND DUNN**

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
(1) Residential	4.08	4.657	5.292	6.014	6.834	7.766	8.825	10.029	11.397	12.951
(2) Commercial	0.19	0.18	0.21	0.23	0.27	0.30	0.34	0.39	0.44	0.50
(3) Industrial										
(4) Institutional	0.286	0.408	0.464	0.527	0.599	0.681	0.774	0.880	0.999	1.136
(5) System Processes	0.89	0.559	0.635	0.722	0.820	0.932	1.059	1.203	1.368	1.554
(6) Unaccounted-for water	1.00	0.930	1.06	1.200	1.370	1.550	1.770	2.010	2.280	2.590
(7) Total Service Area Demand [sum (1) thru (6)]	6.446	6.736	7.655	8.699	9.885	11.234	12.766	14.507	16.485	18.733

****DISTRIBUTED ALL CONTRACT SALES WITHIN COUNTY TO SERVICE AREA DEMAND CALCULATIONS**

7-C. Is non-residential water use expected to change significantly through 2050 from current levels of use? F No F Yes
If yes, please explain:___

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
Harnett County Regional WTP		Surface	Cape Fear2-3	II	6	1	2001
Harnett County Regional WTP		Surface	Cape Fear2-3	II	unknown	5	2006

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

7-E. What is the Total Amount of Future Supplies available for Regular Use? ____6_____ 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		
Fuquay Varina	03-92-055	4.70	1989	2029	36	R
Carolina Trace		0.10	2003		6	R
Moore County		2.00	2003		12	R
Spring Lake		0.015	2001		12	R
Wellons		0.50	2001	PERPETUAL	6/12	E

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

7-G. What is the total amount of existing Future Sales Contracts for Regular Use? ____7.45_____ MGD

SYSTEM NAME HARNETT COUNTY PUBLIC UTILITIES PWSID 03-43-045

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)	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
(2) Existing Ground Water Supply (Item 3-G)	0	0	0	0	0	0	0	0	0	0	0
(3) Existing Purchase Contracts (Item 3-E)	0	0	0	0	0	0	0	0	0	0	0
(4) Future Supplies (Item 7-E)	0	0	0	0	0	0	0	0	0	0	0
(5) **Total Available Supply** [sum (1) thru (4)]	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
Average Daily Demand, MGD											
(6) Service Area Demand (Item 7-B, Line 7)	6.446	6.376	7.655	8.699	9.885	11.234	12.766	14.507	16.485	18.733	21.288
(7) Existing Sales Contracts (Item 2-H)	0.720	1.03	1.33	1.79	2.22	3.05	3.87	4.85	6.29	7.02	7.74
(8) Future Sales Contracts (Item 7-G)	0.200	0.350	1.430	2.040	2.650	2.950	3.250	3.500	3.750	4.250	4.750
(9) **Total Average Daily Demand** [sum (6) thru (8)]	7.37	8.89	10.41	12.583	14.76	17.32	19.88	23.20	26.52	30.15	33.77
(10) Demand as Percent of Supply [(9) / (5)] x 100	23.03	27.78	32.53	39.31	46.19	54.13	62.13	72.50	82.88	94.22	105.55
(11) **Supply Needed to maintain 80%** **[(9) / 0.8] - (5)**	0	0	0	0	0	0	0	0	0.92	4.55	8.17
Additional Information for Jordan Lake Allocation											

SYSTEM NAME HARNETT COUNTY PUBLIC UTILITIES PWSID 03-43-045

Available Supply, MGD	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
(12) Sales Under Existing Contracts	0.72	1.03	1.33	1.79	2.22	3.05	3.87	4.85	6.29	7.02	7.74
(13) Expected Sales Under Future Contracts	0.20	0.350	1.43	2.04	2.65	2.95	3.25	3.50	3.75	4.25	4.75
(14) Demand in each planning period [(6)+(12)+(13)]	7.37	8.89	10.41	12.583	14.76	17.32	19.88	23.20	26.52	30.15	33.77
(15) Supply minus Demand [(5) - (14)]	24.63	23.11	21.59	19.42	17.24	14.68	12.12	8.80	5.48	1.85	-1.77

8-B. Does Line 10 above indicate that demand will exceed 80% of available supply before the year 2030? ☐ No **X** Yes
If yes, your Jordan Lake Water Supply Storage Allocation Application should include the following items:

(1) Alternatives for obtaining additional water supply to meet future demands. Use the following tables to summarize the various future water supply alternatives available to your system. Attach a detailed description of each water supply project shown in each alternative. 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. A program should include: conducting water audits at least annually 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, such as placing a moratorium on additional water connections until the additional supply is available or amending or developing your water shortage response ordinance to trigger mandatory water conservation as water demand approaches 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"	24.63	23.11	21.59	19.42	17.24	14.68	12.12	8.80	5.48	1.85	-1.77
(2) Available supply from Project 1 (describe)											
Available supply from Project 2 (describe)											
Available supply from Project 3 - Dam on Deep river								18	18	18	18
(3) Supply available for future needs [(1) + (2)]											
(4) Total discharge to Source Basin											

SYSTEM NAME HARNETT COUNTY PUBLIC UTILITIES PWSID 03-43-045

(#1)		2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
(5)	Consumptive Use in Source Basin											
(6)	Total discharge to Receiving Basin											
(7)	Consumptive Use in Receiving Basin											
(8)	Amount not returned to Source Basin [(6) + (7)]											

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

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"	24.63	23.11	21.59	19.42	17.24	14.68	12.12	8.80	5.48	1.85	-1.77
(2) Available supply from Project 1 (describe)											
Available supply from Project 2 (describe)											
Available supply from Project 3 (describe)											
(3) Supply available for future needs [(1) + (2)]											
(4) Total discharge to Source Basin											
(5) Consumptive Use in Source Basin											
(6) Total discharge to Receiving Basin											
(7) Consumptive Use in Receiving Basin											
(8) Amount not returned to Source Basin [(6) + (7)]											

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

SYSTEM NAME HARNETT COUNTY PUBLIC UTILITIES PWSID 03-43-045

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? ☐ No **X** Yes
If yes, what are your plans for increasing water treatment capacity?

The County is currently working with the State to upgrade the plant filtration rate to 6 gpm/ft2. This filtration rate will increase the plant production capacity to 18 mgd. The County is currently working on the next major upgrade which will occur in 4 to 5 years.

8-D. Does this system have an interconnection with another system capable of providing water in an emergency? ☐ No **X**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? ☐ No **X** Yes Please describe. The County has been active in developing a regional water system. We are currently installing the transmission lines to serve Southern Wake County. The system already serves Harnett County, but areas in five other counties. We currently have interconnections with Erwin, Dunn, Johnston County, Fuquay Varina . The County is also working on agreements with Smithfield and
Raleigh.

F. List the major water supply reports or studies used for planning. Water Supply Plan 1992, 1995, 1996, 1997 and 1998.

SECTION 9: TECHNICAL ASSISTANCE NEEDS

Is technical assistance needed:

9-A. to develop a local water supply plan? X No F Yes

9-B. with a leak detection program? X No F Yes

9-C. with a demand management or water conservation program? X No F Yes

9-D. with a water shortage response plan? X No F Yes

9-E. to identify alternative or future water supply sources? X No F Yes

9-F. with a capacity development plan? X No F Yes

9-G. with a wellhead or source water protection plan? X No F Yes

9-H. with water system compliance or operational problems? X No F Yes

9-I. with Consumer Confidence Reports? X No F 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.

HARNETT COUNTY
WATER USE CALCULATIONS FOR YEAR 2000

A. RESIDENTAL USE

2000 POPULATION = 66,097

4.08 mgd / 66097 population X 1,000,000 / 1 mg = 62.0 gallons per day per person

AVERAGE USE

	population	gpdpc	mgd	
2000	66,097	62.0	4.098	
2005	75,112	62.0	4.657	
2010	85,356	62.0	5.292	population
2015	96,997	62.0	6.014	based on State Planning
2020	110,226	62.0	6.834	information minus
2025	125,259	62.0	7.766	Dunn/Erwin population
2030	142,342	62.0	8.825	increase by 2.59% compound Growth
2035	161,755	62.0	10.029	
2040	183,816	62.0	11.397	
2045	208,885	62.0	12.951	
2050	237,374	62.0	14.717	

PEAK DEMAND

	mgd		peak factor	peak mgd
2000	4.098	X	1.5	6.147
2005	4.657	X	1.5	6.985
2010	5.292	X	1.5	7.938
2015	6.014	X	1.5	9.021
2020	6.834	X	1.5	10.251
2025	7.766	X	1.5	11.649
2030	8.825	X	1.5	13.238
2035	10.029	X	1.5	15.043
2040	11.397	X	1.5	17.095
2045	12.951	X	1.5	19.426
2050	14.717	X	1.5	22.076

B. PROJECTED AVERAGE DAILY COUNTY SERVICE AREA DEMAND (MGD)

Includes County, Angier, Lillington, Coats, and Linden

	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
:sidental	4.080	4.657	5.292	6.014	6.834	7.766	8.825	10.029	11.397	12.951	14.717
Commercial	0.19	0.18	0.21	0.23	0.27	0.30	0.34	0.39	0.44	0.50	0.57
Industrial &											
Institutional	0.206	0.408	0.464	0.527	0.599	0.681	0.774	0.880	0.999	1.136	1.291
Inplant Useage	0.890	0.559	0.635	0.722	0.820	0.932	1.059	1.203	1.368	1.554	1.766
un-acct for water	1.00	0.93	1.06	1.20	1.37	1.55	1.77	2.01	2.28	2.59	2.94
Total Area Demand	6.446	6.736	7.655	8.699	9.885	11.234	12.766	14.507	16.485	18.733	21.288

1. Commerical calculated @ 3.88% residential demand
2. Institutional calculated @ 8.77% of residential demand
3. Backwash and Blowdown water Calculated@ 12.0% of residential demand
4. Unaccounted water calculated @ 20.0% system loss

C. SALES CONTRACTS (PRESENT AND FUTURE)

Present

		Contract Amount (MGD)	(MGD)	R/E	
1	Lillington		2.00	R	Included in County Demand Projections
2	Holly Springs		1.00	R	Has Own Allocation
3	Angier		2.02	R	Included in County Demand Projections
4	Coats		0.72	R	Included in County Demand Projections
5	Fuquay Varina	1.30		R	See Projection
6	Linden	0.25		R	See Projection
7	Woodlake	0.14		R	See Projection
8	Johnston Co.	n/a		E	
9	Dunn		2.5	E	
10	Erwin		1.00	E	
	SALES CONTRACTS	1.69			

DEMAND PROJECTIONS OF (CURRENT) CUSTOMS OUTSIDE COUNTY BOUNDARY

CUSTOMER	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
FUQUAY(TOTAL)	1.05	1.12	2.19	3.43	4.67	5.44	6.22	7.12	8.01	8.90	9.79
FROM HCWTP	0.55	0.83	1.10	1.52	1.92	2.70	3.47	4.62	5.76	6.40	7.04
WOODLAKE	0.09	0.11	0.13	0.15	0.17	0.20	0.23	0.03	0.30	0.36	0.41
LINDEN	0.08	0.09	0.10	0.12	0.13	0.15	0.17	0.20	0.22	0.26	0.29
TOTAL(ITEMC)	0.72	1.03	1.33	1.79	2.22	3.05	3.87	4.85	6.29	7.02	7.74

Future

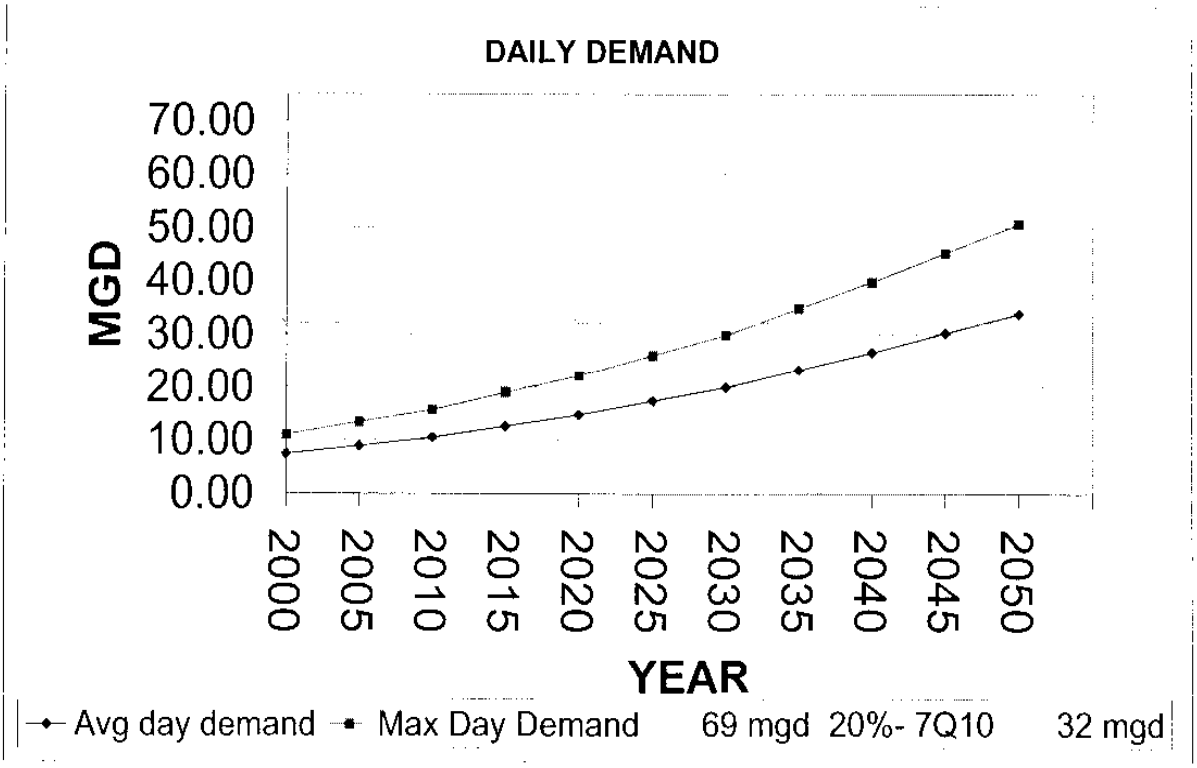
		Contract Amount (MGD)	R/E		
1	Fuquay Varina	4.70		R	See above
2	Holly Springs		8.50	R	Not included due to separate Allocation
3	Carolina Trace	0.10		R	Under negotiations
4	Moore County	2.00		R	Contract 2003
5	Spring Lake	0.15		R	Contract 2001
6	Spring Lake		0.85	E	
7	Wellons	0.50		R	Purchased 2001
	Total	7.45			

DEMAND PROJECTIONS OF (FUTURE) CUSTOMS OUTSIDE COUNTY BOUNDARY

CUSTOMER	2000	2005	2010	2015	2020	2020	2030	2035	2040	2045	2050
Carolina Trace	0.00	0.04	0.08	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Moore County	0.00	0.05	0.90	1.45	2.00	2.25	2.50	2.75	3.00	3.50	4.00
Spring Lake	0.00	0.02	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Wellons	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.50	0.50	0.50	0.50
TOTAL	0.20	0.35	1.43	2.04	2.65	2.95	3.25	3.50	3.75	4.25	4.75

D. AVERAGE DAILY DEMAND, MGD

	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Service Area Demand (item B)	6.446	6.736	7.655	8.699	9.885	11.234	12.766	14.507	16.485	18.733	21.288
Sales Contracts (item C)	0.72	1.03	1.33	1.79	2.22	3.05	3.87	4.85	6.29	7.02	7.74
Future Sales Contracts (item C)	0.20	0.35	1.43	2.04	2.65	2.95	3.25	3.50	3.75	4.25	4.75
Total Average Daily Demand	7.37	8.89	10.41	12.58	14.76	17.32	19.88	23.20	26.52	30.15	33.77
Maximun Day Demand	11.05	13.33	15.61	18.87	22.13	25.98	29.82	34.80	39.78	45.22	50.66



Water System: **Harnett County**
Source Basin: **Cape Fear (2-3)**
Receiving Basin(s): **Cape Fear (2-3)/Neuse(10-1)**

Date:
Prepared By:

PART 3: Water Supply System Report for Calender 2000

Water Balance Table - Average Daily Values

Year	Water Systems Purchasing Water From Harnett Co.	Withdrawal From Cape Fear	Consumptive Loss				Wastewater Discharge				Total Return to				Transfer Cape Fear to (I)=(C)-(H)		
			Cape Fear	Neuse	Lumber	Deep	Cape Fear	Neuse	Lumber	Deep	Cape Fear	Neuse	Lumber	Deep	Neuse	Lumber	Deep
(A)	(B)	(C)	(D)	(E)	(E)	(E)	(F)	(F)	(F)	(F)	(H)= (D)+(F)	(H)	(H)	(H)	(I)	(I)	(I)
1992	FUQUAY VARINA	0.25	0.06				0.89				0.95				-0.70		
1997	FUQUAY VARINA	0.43	0.09				0.63				0.72				-0.29		
2000	FUQUAY VARINA	0.75	0.15				0.65				0.80				-0.05		
	HOLLY SPRINGS	0.25	0.05				0.40				0.45				-0.20		
2010	FUQUAY VARINA	5.00	1.00	0.56			1.20	2.24			2.20	2.80			2.20		
	HOLLY SPRINGS	8.50	1.70				6.80				8.50						
	CHATHAM COUNTY	2.00	0.40				1.60				2.00						
	MOORE COUNTY	2.00	0.40		0.12		1.00		0.48		1.40		0.20	0.40		0.20	0.40
2020	FUQUAY VARINA	6.00	1.20	0.72			1.20	2.88			2.40	3.60			2.40		
	HOLLY SPRINGS	8.50	1.70				6.80				8.50						
	CHATHAM COUNTY	2.00	0.40				1.60				2.00						
	MOORE COUNTY	2.00	0.40		0.12		1.00		0.48		1.40		0.20	0.40		0.20	0.40

1 column (I) for Fuquay 1997 and 2000 reports negative transfer of water. This is due to water from the Neuse being transferred to the south side plant in Fuquay which discharges into Cape Fear (2-3).
2 Discharge records from the south side plant indicated more flow discharged into the Cape Fear basin then is being transferred to Fuquay. Reported no wastewater plant discharge into the Neuse for 1997-2000 in column (G).
3 column (F) for Fuquay year 2010,2020 reports south side plant treatment capacity.
4 column (C) years 2010 and 2020 for Fuquay and Holly Springs reports contracted amount of water usage.
5 Chatham County and Moore County water use is based on contract amount.
6 wastewater discharge from Chatham and Moore could be in the Lumber and Deep River basins.
7 consumptive loss for Chatham and Moore to the Deep or Lumber are assumed to be 20% of the loss to the Cape Fear.
8 Cape Fear consumptive loss is assumed to be 20 %.
9 Fuquay wastewater discharge is based of current plant treatment capacity

Source Basin: ***Cape Fear (2-3)*** *Prepared By*

Receiving Basin(s): ***Cape Fear (2-3)/Neuse(10-1)***

PART 3: Water Supply System Report for Calender 2000

Water Balance Table - Maximum Daily Values

Year	Water Systems Purchasing Water From Harnett Co.	Withdrawal From Cape Fear	Consumptive Loss				Wastewater Discharge				Total Return to				Transfer Cape Fear to (I)=(C)-(H)		
			Cape Fear	Neuse	Lumber	Deep	Cape Fear	Neuse	Lumber	Deep	Cape Fear (H)= (D)+(F)	Neuse	Lumber	Deep	Neuse	Lumber	Deep
(A)	(B)	(C)	(D)	(E)	(E)	(E)	(F)	(F)	(F)	(F)		(H)	(H)	(H)	(I)	(I)	(I)
1992	FUQUAY VARINA	0.38	0.06				0.89				0.97				-0.59		
1997	FUQUAY VARINA	0.65	0.13				0.63				0.76				-0.11		
2000	FUQUAY VARINA	1.13	0.23	0.05			0.65	0.20			0.88	0.25			0.25		
	HOLLY SPRINGS	0.75	0.15				0.00				0.15				0.60		
2010	FUQUAY VARINA	6.00	1.20	0.58			1.20	2.30			2.40	2.88			3.60		
	HOLLY SPRINGS	8.50	1.90				6.60				8.50						
	CHATHAM COUNTY	2.00	0.40				1.60				2.00						
	MOORE COUNTY	2.00	0.40				1.00		0.20	0.40	1.40		0.20	0.40		0.20	0.40
2020	FUQUAY VARINA	6.00	1.20	0.72			1.20	2.88			2.40	3.60			3.60		
	HOLLY SPRINGS	8.50	1.90				6.60				8.50						
	CHATHAM COUNTY	2.00	0.40				1.60				2.00						
	MOORE COUNTY	2.00	0.40				1.00		0.20	0.40	1.40		0.20	0.40		0.20	0.40

1 Maximum values use a peak factor of 1.5

2 Years 2010 and 2020 assume maximum withdrawal to be the purchase contract amount alloted. This includes all entities in the table.