BASIN 9 LUMBER

BASIN DESCRIPTION

The Lumber Basin runs along the South Carolina border from the Sandhills to the Atlantic Ocean in Brunswick County. The basin is divided into four sub-basins. Despite its name the basin is actually four separate basins, three of which form headwaters of larger basins that are mostly in South Carolina.

Drainage from the Big Shoe Heel Creek sub-basin joins the Little Pee Dee River in Dillon County SC and continues flowing southeast. The Lumber River, which originates in Moore and Montgomery counties, flows southeasterly past Lumberton and turns southwesterly dividing Robeson and Columbus counties. The Lumber flows into South Carolina and merges with the Little Pee Dee east of Mullins, SC. The Little Pee Dee joins the Yadkin River, forming the Great Pee Dee River that later empties into the Atlantic Ocean near Georgetown, SC. The Waccamaw River is a Coastal Plain waterway flowing southwesterly from Columbus and Brunswick counties before merging with the same estuarine system as the Great Pee Dee River system. Streams in the Shallotte River sub-basin flow into the Atlantic Ocean, primarily through the Shallotte River and Lockwood's Folly River drainages.

WATER USE

Factors Affecting Water Demand

This basin has about 4% of the state's residents and contains all or part of 51 municipalities in ten counties. Two of the state's 12 major metropolitan areas depend on this basin for water supply. From 1990 to 1997 year-round population in three counties in this basin grew by 10% or more. Brunswick County (28%) and Hoke County (26%) ranked third and fifth, respectively, in population growth from 1990 to 1997. Most of the water supplying the rapidly growing coastal communities in Brunswick County comes from the Cape Fear River.

Total Water Use in Basin

The U.S. Geological Survey's (USGS) 1995 summary of water use estimated total water use in the basin at 69 million gallons per day (mgd), with slightly less than half coming from surface water sources. USGS estimated total basin population at 277,390. Residential demand was estimated at 19 mgd with about three quarters of this demand being supplied by public water systems. Overall, public water systems supplied 10.7 mgd from surface water and 17.7 mgd from ground water for both residential and non-residential uses. The remaining residential water demand was met by five mgd of self-supplied ground water. In addition, about 35 mgd of self-supplied water were withdrawn for non-residential water uses.



Local Water Supply Plans (LWSPs)

Units of local government that supply or plan to supply water to the public are required to develop a LWSP. The Division of Water Resources (DWR) reviews LWSPs and maintains a database of the LWSP information. This summary is based on data contained in the 1997 LWSPs.

LWSPs were submitted by 37 public water systems using water from this basin. (Raeford has not submitted a 1997 LWSP, so its 1992 LWSP data was used in these summaries.) These systems supplied 32.5 mgd of water to 169,685 persons. The following table summarizes the LWSP population served with water from this basin and its water use for 1997.

1997 LWSP System Water Use from Basin (mgd)							
Sub-basin	LWSP Population	P Residential Non-residential tion Use Use		Total Use*			
Lumber River	129,357	8.43	13.22	25.3			
Big Shoe Heel Cr.	22,506	2.41	1.95	4.8			
Waccamaw River	17,822	1.36	0.63	2.4			
Shallotte River	systems in this basin get water from Cape Fear River						
Total	169,685	12.2	15.8	32.5			
*Total Use also includes unaccounted-for water and system process water							

For these systems non-residential water use accounted for 49% of total use with residential use consuming 37% and 11% was unaccounted-for water.

LWSP systems that use water from this basin expect to supply water to over 254,257 persons by the year 2020, a 50% increase over 1997 levels. Their demand for water is projected to grow 68% to 55 mgd by 2020.

In the 1997 LWSPs, five of the 37 systems using water from this basin reported that their peak demands will exceed their water treatment capacity by 2010.

Water systems should maintain adequate water supplies and manage water demands to ensure that average daily use does not exceed 80% of their available supply. Data for 1997 indicates that four of the 37 LWSP systems addressed in this basin summary had average demand above this threshold. By 2020, 11 systems project demand levels that will exceed 80% of their available supply.

Self-supplied Use

The USGS estimated that self-supplied users, excluding power generating facilities, accounted for 52 mgd of the 169 mgd total of water used from this basin, as shown in the table below. Irrigation use comprised 50% of the self-supplied uses, followed by industrial (21%), livestock (16%), domestic (13%), and commercial (<1%).

1995 USGS Estimated Self-supplied Water Use in mgd								
Sub-basin	Domestic	Livestock	Industrial	Commercial	Irrigation	Total		
Lumber River	2.61	4.39	5.59	0.13	10.64	23.4		
Big Shoe Heel C	1.17	0.94	2.95	0.01	1.14	6.2		
Waccamaw R.	0.70	0.95	0.00	0.14	1.20	3.0		
Shallotte River	0.58	0.06	0.00	0.05	6.98	7.7		
Basin Total	5.1	6.3	8.5	0.3	20.0	40.2		

Registered Water Withdrawals

Anyone withdrawing 1.0 mgd or more of surface or ground water for agricultural uses or 100,000 gallons per day for other uses is required to register that withdrawal with DWR. Registered withdrawals in this basin are summarized in the table below.

Registered Water Withdrawals for 1999								
Sub-basin	Agricultural		Non-agricultural		Total			
	#	mgd	#	mgd	#	mgd		
Lumber River	1	0.676	10	14.914	11	15.59		
Big Shoe Heel Creek	0	0	2	1.082	2	1.082		
Waccamaw River	0	0	0	0	0	0		
Shallotte River	0	0	1	0.614	1	0.614		
Total	1	0.676	13	16.61	14	17.286		

The registered non-agricultural users listed above include eight golf courses, four industrial users, and one private water supply system. The four industrial users averaged nearly 11 mgd of water use in 1997.

WATER AVAILABILITY

LWSPs indicate that two water systems in these subbasins withdraw about 10.9 mgd of surface water from river intakes in 1997. The available supply from these river intake sources, based on information reported in local water supply plans, is about 20 mgd.

There are 30 systems in this basin using ground water. They have an overall supply of 40.35 mgd of ground water based on the 12-hour yields supplied in their LWSPs. Some ground water level declines are occurring in portions of the southern Coastal Plain in response to increased pumping. DWR will continue to monitor this situation, since decreases in ground water availability can occur.

INTERBASIN TRANSFERS OF SURFACE WATER

Across the state many water users and systems move water between sub-basins to meet their needs. Regulatory approval is generally needed for transfers of 2.0 mgd or more. The table below summarizes the identified interbasin transfers in 1997 associated with this basin.

Estimated Interbasin Transfers based on 1997 data							
Sub-basin	Number	mgd OUT	mgd IN				
Lumber River	4	0	0.21				
Big Shoe Heel Creek	2	0	0				
Waccamaw R.	0	0	0				
Shallotte River	6	0	1.89				

Water sales from Brunswick County to Long Beach,

Holden Beach, Sunset Beach, Shallotte, and Carolina Blythe resulted in the transfers into the Shallotte Basin. Wastewater transfers from Carthage and Vass to Moore County account for most of the transfer into the Lumber Basin. Two minor transfers into Big Shoe Heel Creek involving Hamlet and Richmond County were not quantified.

SUMMARY OF INFORMATION FROM 1997 LWSPs

! Total per capita water use for the basin was 192 gallons per day (gpd) in 1997 and is projected to increase to 204 gpd by 2010.

! 16 systems are not connected to another water supply system capable of supplying water in an emergency.

! 23 water systems purchased 8.7 mgd of water from this basin. Eight of these systems had no purchase contract.

! Four systems rely on purchase water as their sole supply.

! The systems used 10.9 mgd from surface water and 21.6 mgd from ground water.

! The reported raw water supply was 20 mgd of surface water and a 12-hour ground water supply of 40.4 mgd.

! There are five county-wide systems and two regional water supply systems, Hoke County RWS and Brunswick County. The Brunswick County water system provides water to ten systems in the Lower Lumber River Basin region. The Robeson County water system has the potential for a regional system with current connections between eight other systems in the county.

! Nine systems were planning additional supplies totaling 13 mgd in the 1997 LWSPs, including 3 systems planning to connect to other systems.

! The systems are projecting significant growth, 50% in population and 76% in water demand, by 2020.

! About 2.1 mgd of additional water supply will be needed by water systems to ensure that water demands in 2010 do not exceed 80% of available supply.

! Systems reporting high Demand-to-Supply Ratios:

	1997	2010
Demand exceeds available supply	1	4
Demand exceeds 80% of available supply	4	5

January 2001 State Water Supply Plan Division of Water Resources, DENR



197 2010 Population and Water Use as reported by LWEP systems using valuer from this basi: Vertree values	LUMBER RIVER BASIN (9)									
Water Systems showing "Demand as % of Supply" show be actively managing demand and pursuing additional supplies Mater Systems Supplier Average table pleared (reg) Average table pleared (reg) <th colspa<="" td=""><td colspan="8">1997 and 2010 Population and Water Use as reported by LWSP systems using water from this basin.</td></th>	<td colspan="8">1997 and 2010 Population and Water Use as reported by LWSP systems using water from this basin.</td>	1997 and 2010 Population and Water Use as reported by LWSP systems using water from this basin.								
Water Systems by County Water Source of Supplier Tear-count Sector Party Aussage Buily Lomated (regin) Aussage Supplier Party Party Party	Water systems showing "Demand as % of Sup	Water systems showing "Demand as % of Supply" above 80% should be actively managing demand and pursuing additional supplies. mgd = million gallons per day								
Water Systems by County Water Source or Supplier 1997 2010 1997 2010 1997 2010 BLADEN Upper Cape Fear Aquifer / ELIZABETHTOWN 4282 6188 0.261 0.51 0.667 55% 75% BLADENOKO Presebre Aquifers 757 772 0.13 0.182 0.378 0.384 0.455 DOUTIN Black Creek Aguifer 204 225 0.0071 0.018 0.18 2.49 29% 29% BULTON Black Creek Aguifers 306 200 0.043 0.0471 0.0383 0.0333 0.333 53% 61% COLUMEUS Black Creek Aguifers 200 2430 0.0474 0.0333 0.0333 53% <th></th> <th></th> <th colspan="2">Year-round Service Population</th> <th>Average Daily</th> <th>Demand (mgd)</th> <th>Available S</th> <th>upply (mgd)</th> <th colspan="2">Demand as % of Supply</th>			Year-round Service Population		Average Daily	Demand (mgd)	Available S	upply (mgd)	Demand as % of Supply	
BLADEN Upper Cape Fair Aquifer / ELIZABETHTOWN 4282 518 0.51 0.667 53% 75% BLADEN COW D- W BLADEN Peedee Aquifers 777 772 0.038 0.261 0.611 0.611 34% 43% CLARKTON Peedee A Blick Creek Aquifers 777 772 0.03 0.067 0.058 <th>Water Systems by County</th> <th>Water Source or Supplier</th> <th>1997</th> <th>2010</th> <th>1997</th> <th>2010</th> <th>1997</th> <th>2010</th> <th>1997</th> <th>2010</th>	Water Systems by County	Water Source or Supplier	1997	2010	1997	2010	1997	2010	1997	2010
BLADEN CO VD - VB LADEN Upper Cape Faar Aquifer (LLZABETHTOWN) 4282 6158 0.057 0.677 0.687 0.578 53% 75% BLADENBORD Peedee Aquifer Aquifers 777 722 0.13 0.162 0.278 0.318 0.438 0.041 0.042 0.144 0.144 0.348 0.378 0.378 0.388 0.378 0.378 0.378 0.378 0.378 0.378 0.378 0.378 0.378 0.378 0.378 0.378 <td>BLADEN</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	BLADEN									
BLADENBORO Péedes Aquifer 1980 2100 0.208 0.201 0.611 0.611 94% 43% CLARKTON Peedes & Black Creek Aquifers 777 782 0.13 0.162 0.378 0.378 0.378 0.378 0.378 0.378 0.378 0.378 0.378 0.378 0.378 0.378 0.378 0.378 0.378 0.378 0.378 0.378 0.41 0.41 0.41 0.41 0.41 0.41 0.44 29% 29% DUILINEUS Back Creek Aquifers 355 500 0.414 0.043 0.047 0.144 0.444 29% 29% DUILINEUS Back Creek Aquifers 3260 200 0.043 0.047 0.144 0.434 24% 23% 25% 0.578 0 0.848 0.6578 0 0.844 0% 67% 10% 10% 10% 10% 10% 10% 10% 10% 10% 10% 10% 10% 10%	BLADEN CO WD - W BLADEN	Upper Cape Fear Aquifer / ELIZABETHTOWN	4282	6158	0.351	0.5	0.667	0.667	53%	75%
CLARKTON Peadee klack Creek Aquifers 777 782 0.13 0.162 0.278 0.378 0.478 43% SDUTH BLADEN WA CLARKTON 554 529 0.069 0.068 0.069 0.1 100% 103% 193% SDUTM Black Creek Aguifer 204 225 0.027 0.0314 0.21 0.21 13% 19% SDUTM Black Creek Aguifers 204 225 0.027 0.0314 0.047 0.18 0.142 29% 29% CALMBUS Black Creek Aguifers 2000 2700 0.499 0.574 0.933 0.333 535 615 CALMBUS OVDIII Unspecified grand water source 0 4463 0 0.578 0.698 0.655 75% 113% CALMBUS OVDIII Unspecified grand water source 0 4403 0.14 0.233 0.139 0.149 0.33 0.555 75% 113% LAKE WACAMAW Peedes & Black Creek Aguifer 2170 <td< td=""><td>BLADENBORO</td><td>Peedee Aquifer</td><td>1980</td><td>2100</td><td>0.208</td><td>0.261</td><td>0.611</td><td>0.611</td><td>34%</td><td>43%</td></td<>	BLADENBORO	Peedee Aquifer	1980	2100	0.208	0.261	0.611	0.611	34%	43%
DUBLIN Upper Cape Fear Aquifer 447 450 0.05 0.05 0.05 100% 103% TAR HELL Black Creek Aquifer 204 225 0.027 0.0314 0.21 0.21 13% 15% BOLTON Black Creek A Surficial Aquifers 306 220 0.041 0.042 0.144 0.144 29% 29% BOLTON Black Creek A Surficial Aquifers 306 220 0.431 0.472 0.14 0.144 29% 29% COLLMBUS CO VD III Unspecified ground water source 0 462 0 0.578 0 0.884 0.88 67% 67% FAR BUFF Peedee & Black Creek Aquifers 1076 1105 0.126 0.131 0.488 0.828 27% 16% LARE WACCAMAW Peedee & Black Creek Aquifers 1770 1440 0.144 0.237 1.19 1.19 1.37 1.37% 1.37% 1.37% 1.35% 2.785 0.85% 0.85% 0.85% 0.85%	CLARKTON	Peedee & Black Creek Aquifers	757	782	0.13	0.162	0.378	0.378	34%	43%
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TAR HELL Bitak Creek Aguifer 204 225 0.021 0.21 0.21 13% 15% BOLTON Bitak Creek & Suricial Aguifers 53 550 0.041 0.042 0.144 0.144 29% 29% 29% BOLTON Bitak Creek & Suricial Aguifers 306 280 0.043 0.047 0.18 0.18 24% 29% 66% 61%	SOUTH BLADEN WA	CLARKTON	554	529	0.069	0.068	0.069	0.1	100%	68%
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BOLTON Black Creek & Surficial Aquifers 553 550 0.041 0.042 0.14 0.144 0.144 29% 29% BRUNSWICK Peedee & Black Creek Aquifers 306 280 0.043 0.047 0.18 0.18 24% 28% COLUMBUS CO WD III Unspecified ground vater source 0 4623 0 0.578 0 0.864 0.864 0.864 0.878 0.255 0.756 113% LAKE WACCAMW Peedee & Black Creek Aquifers 1270 1440 0.194 0.278 1.19 1.19 4.278 31% TABC CITY Peedee & Black Creek Aquifers 7200 2920 1.191 1.055 2.69 80% 91% HOKE CO RWS Black Creek Aquifer 3910 4800 1.225 2.461 2.15 2.69 80% 91% HOKE CO RWS Black Creek Aquifer 3910 4800 0.065 0.058 0.152 0.17 36% 35% HOKE CO RWS Bedrock Wells NC DEPT. OF	COLUMBUS									
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CHADBOURN Black Creek & Peedee Aquifers 2500 2760 0.499 0.574 0.333 0.933 53% 61% COLLIMBUS CO WD III Unspecified ground water source 0 4623 0 0.576 0 0.864	BRUNSWICK	Peedee & Black Creek Aquifers	306	280	0.043	0.047	0.18	0.18	24%	26%
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FAIR BLUFF Peedee & Black Creek Aquifers 1076 1105 0.126 0.131 0.468 0.228 27% 119% LAKE WACCMMW Peedee & Black Creek Aquifers 1270 1440 0.144 0.0373 1.19 1.19 42% 31% WHTEVILLE Peedee & Black Creek Aquifers 7800 9290 1.191 1.805 2.26 2.726 53% 66% HOKE Peedee & Black Creek Aquifers 7800 9290 1.191 1.805 2.26 2.726 53% 66% HOKE Bedrock Wells NO DEPT. OF CORRECTIONS 12700 2300 0.902 2.327 1.857 2.181 49% 107% WOORE Bedrock Wells 3648 6074 0.897 1.278 1.764 1.764 51% 72% FOXFIRE VILLAGE Bedrock Wells SOUTHERN PINES 0 59 0.0 0 0 0 0 0 0 0 0 0.75 0% 0% 0% 0%	COLUMBUS CO WD III	Unspecified ground water source	0	4623	0	0.578	0	0.864	0%	67%
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HOKE Doto Doto <thdoto< th=""> Doto Doto <thd< td=""><td>WHITEVILLE</td><td>Peedee & Black Creek Aquifers</td><td>7800</td><td>9290</td><td>1.191</td><td>1.805</td><td>2.26</td><td>2.726</td><td>53%</td><td>66%</td></thd<></thdoto<>	WHITEVILLE	Peedee & Black Creek Aquifers	7800	9290	1.191	1.805	2.26	2.726	53%	66%
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WOORE Database Database <thdatabase< th=""> Database <th< td=""><td>HOKE CO RWS</td><td>Bedrock Wells/ NC DEPT OF CORRECTIONS</td><td>12700</td><td>23800</td><td>0.902</td><td>2 327</td><td>1 857</td><td>2 181</td><td>49%</td><td>107%</td></th<></thdatabase<>	HOKE CO RWS	Bedrock Wells/ NC DEPT OF CORRECTIONS	12700	23800	0.902	2 327	1 857	2 181	49%	107%
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FOXFIRE VILLAGE Bedrock Wells 403 489 0.055 0.0588 0.152 0.17 36% 35% MOORE CO (ADDOR) SOUTHERN PINES 0 59 0 0.002 0 0.75 0% 0% MOORE CO (THE CAROLINA) SOUTHERN PINES 0 0 0 0 0 0 0 0 0 0 0 0% 0% PINEBLUFF Bedrock Wells / SOUTHERN PINES 979 1400 0.099 0.155 0.592 0.582 17% 27% ROBESON Term PINES Drowning Creek 12175 14456 2.69 4.92 4 8 67% 62% ROBESON FAIRMONT Black Creek Aquifer 2550 2746 0.285 0.644 1.116 1.16 5% 5% FAIRMONT Black Creek Aquifer 2550 2746 0.285 0.644 1.116 1.46 6% 5% 5% 4% 6% 6% 6% 6%	ABERDEEN	Bedrock Wells	3648	6074	0 897	1 278	1 764	1 764	51%	72%
MOORE CO (ADDOR) SOUTHERN PINES 0 0.0 0.002 0 0.75 0% 0% MOORE CO (THE CAROLINA) SOUTHERN PINES 0	FOXFIRE VILLAGE	Bedrock Wells	403	489	0.055	0.0588	0 152	0.17	36%	35%
MOORE C0 (THE CAROLINA) SOUTHERN PINES 0	MOORE CO (ADDOR)	SOUTHERN PINES	0	59	0	0.002	0	0.75	0%	0%
PINEBLUFF Bedrock Wells / SOUTHERN PINES 979 1400 0.099 0.155 0.592 0.582 17% 27% SOUTHERN PINES Drowning Creek 12175 14456 2.69 4.92 4 8 67% 62% ROBESON FAIRMONT Black Creek Aquifer 2550 2746 0.285 0.644 1.116 1.116 2.6% 58% LUMBERTON Lumber River 23112 29898 8.423 12.553 19.6 19.6 43% 64% MAXTON Black Creek Aquifer 3135 3452 0.338 0.457 0.324 0.684 104% 67% PARKTON Black Creek Aquifer / ROBESON CO 531 604 0.205 0.213 0.288 0.688 71% 31% PEMBROKE Black Creek Aquifer / ROBESON CO 531 604 0.205 0.213 0.288 0.688 71% 31% ROBESON CO Black Creek Aquifer / INDERTON / RED SPRING 49700 66200 9.302	MOORE CO (THE CAROLINA)	SOUTHERN PINES	0	0	0	0	0	0	0%	0%
SOUTHERN PINES Drowning Creek 12175 14456 2.69 4.92 4 8 67% 62% ROBESON FAIRMONT Black Creek Aquifer 2550 2746 0.285 0.644 1.116 1.116 26% 58% LUMBERTON Lumber River 23112 29898 8.423 12.553 19.6 19.6 43% 64% MAXTON Black Creek Aquifer 3135 3452 0.338 0.457 0.324 0.684 104% 67% PARKTON Black Creek Aquifer / ROBESON CO 531 604 0.205 0.213 0.288 0.688 71% 31% PEMBROKE Black Creek Aquifer 2660 3906 0.434 0.663 0.792 1.32 77% 71% RODESON CO Black Creek Aquifer MAXTON / ROWLAND / PARKTON / RED SPRING 49700 66200 9.302 10.928 12.5 14 71% 78% MAXTON / ROWLAND / PARKTON / SAINT PAULS MAXTON / ROWLAND / PARKTON / SAINT PAULS 71%	PINEBI LIFE	Bedrock Wells / SOUTHERN PINES	979	1400	0 099	0 155	0 592	0.582	17%	27%
ROBESON Intervent Made	SOUTHERN PINES	Drowning Creek	12175	14456	2.69	4 92	4	8	67%	62%
FAIRMONT Black Creek Aquifer 2550 2746 0.285 0.644 1.116 1.116 1.116 26% 58% LUMBERTON Lumber River 23112 29898 8.423 12.553 19.6 19.6 43% 64% MAXTON Black Creek Aquifer 3135 3452 0.338 0.457 0.228 0.684 104% 67% PARKTON Black Creek Aquifer / ROBESON CO 531 604 0.205 0.213 0.288 0.688 71% 31% PARKTON Black Creek Aquifer / ROBESON CO 531 604 0.205 0.213 0.288 0.688 71% 31% PEMBROKE Black Creek Aquifer 2660 3906 0.434 0.663 0.792 1.36 55% 49% RED SPRINGS Black Creek Aquifer / LUMBERTON / RED SPRING' 49700 6620 9.302 10.928 1.2.5 14 71% 78% ROWLAND Black Creek Aquifer 1180 1400 0.25 0.282 0.576	ROBESON	Browning Grook	12110	11100	2.00	1.02		0	0170	0270
LUMBERTON Lumber River 23112 29898 8.423 12.553 19.6 19.6 43% 64% MAXTON Black Creek Aquifer 3135 3452 0.338 0.457 0.324 0.684 104% 67% PARKTON Black Creek Aquifer / ROBESON CO 531 604 0.205 0.213 0.288 0.688 71% 31% PEMBROKE Black Creek Aquifer / ROBESON CO 531 604 0.205 0.213 0.288 0.688 71% 31% RED SPRINGS Black Creek & Quifer / ROBESC 2660 3906 0.434 0.663 0.792 1.36 55% 49% ROBESON CO Black Creek & Quifer / LUMBERTON / RED SPRING; 49700 66200 9.302 10.928 12.5 14 71% 78% ROWLAND Black Creek Aquifer 1180 1400 0.255 0.282 0.576 0.576 43% 49% SCOTLAND Black Creek & Quifer / ROBESON 2900 3160 0.434 0.4988 </td <td>FAIRMONT</td> <td>Black Creek Aquifer</td> <td>2550</td> <td>2746</td> <td>0 285</td> <td>0 644</td> <td>1 1 1 6</td> <td>1 1 1 6</td> <td>26%</td> <td>58%</td>	FAIRMONT	Black Creek Aquifer	2550	2746	0 285	0 644	1 1 1 6	1 1 1 6	26%	58%
MAXTON Black Creek Aquifer 3135 3432 0.338 0.457 0.324 0.684 10% 67% PARKTON Black Creek Aquifer / ROBESON CO 531 604 0.205 0.213 0.288 0.688 71% 31% PARKTON Black Creek Aquifer / ROBESON CO 531 604 0.205 0.213 0.288 0.688 71% 31% PEMBROKE Black Creek Aquifer / ROBESON CO 531 604 0.205 0.213 0.288 0.688 71% 31% RED SPRINGS Black Creek Aquifer / LUMBERTON / ROBESC 4000 4580 0.783 0.933 1.02 1.32 77% 71% ROBESON CO Black Creek Aquifer / LUMBERTON / RED SPRING 49700 66200 9.302 10.928 12.5 14 71% 78% ROWLAND Black Creek Aquifer 1180 1400 0.25 0.282 0.576 0.576 43% 49% SCOTLAND GIBSON Bedrock Wells 787 820 0.096	LUMBERTON	Lumber River	23112	29898	8 423	12 553	19.6	19.6	43%	64%
Instruction Deck Orece Aquifer Doto Doto <thdoto< th=""> D</thdoto<>	MAXTON	Black Creek Aquifer	3135	3452	0.338	0.457	0 324	0.684	104%	67%
PEMBROKE Black Creek Aquifer 2660 301 0120 <th0120< th=""> 0120</th0120<>	PARKTON	Black Creek Aquifer / ROBESON CO	531	604	0.205	0.213	0.288	0.688	71%	31%
RED SPRINGS Black Creek & Upper Cape Fear Aquifers / ROBESC 4000 4580 0.783 0.933 1.02 1.32 77% 71% ROBESON CO Black Creek & Upper Cape Fear Aquifer / LUMBERTON / RED SPRINGS 49700 66200 9.302 10.928 12.5 14 71% 78% MAXTON / ROWLAND / PARKTON / SAINT PAULS NAXTON / ROWLAND / PARKTON / SAINT PAULS No.433 0.4988 0.576 0.576 43% 49% SCOTLAND Black Creek & Quifer 1180 1400 0.25 0.282 0.576 0.576 43% 49% SCOTLAND Black Creek & Quifer Cape Fear Aquifers 2900 3160 0.434 0.4988 0.818 0.818 53% 61% SCOTLAND Black Creek & Upper Cape Fear Aquifers 2900 3160 0.434 0.4988 0.818 0.818 53% 61% GIBSON Bedrock Wells 787 820 0.096 0.099 0.295 0.295 33% 34% LAURINBURG Bedrock Wells 15907 18104	PEMBROKE	Black Creek Aquifer	2660	3906	0.434	0.663	0 792	1.36	55%	49%
ROBESON CO Black Creek Aquifer LUMBERTON / RED SPRING: 49700 66200 9.302 10.928 1.25 1.4 71% 78% ROBESON CO Black Creek Aquifer 1180 1400 0.25 0.282 0.576 0.576 43% 49% ROWLAND Black Creek Aquifer 1180 1400 0.25 0.282 0.576 0.576 43% 49% SCOTLAND Black Creek Aquifer 1180 1400 0.434 0.4988 0.818 0.818 53% 61% SCOTLAND Bedrock Wells 787 820 0.096 0.099 0.295 0.295 33% 34% LAURINBURG Bedrock Wells 15907 18104 2.841 4.659 3.59 6.19 79% 75% LAURINBURG/MAXTON AIRPORT Bedrock Wells 31 31 31 1.436 2.29 2.03 2.03 72% 113%	RED SPRINGS	Black Creek & Upper Cape Fear Aquifers / ROBESC	4000	4580	0.783	0.933	1.02	1 32	77%	71%
NOLLOGINGO MAXTON / ROWLAND / PARKTON / SAINT PAULS NOC NOC </td <td>ROBESON CO</td> <td>Black Creek Aguifer / LUMBERTON / RED SPRING</td> <td>49700</td> <td>66200</td> <td>9.302</td> <td>10.928</td> <td>12.5</td> <td>14</td> <td>71%</td> <td>78%</td>	ROBESON CO	Black Creek Aguifer / LUMBERTON / RED SPRING	49700	66200	9.302	10.928	12.5	14	71%	78%
ROWLAND Black Creek Aquifer 1180 1400 0.25 0.282 0.576 0.576 43% 49% ST. PAULS Black Creek & Upper Cape Fear Aquifers 2900 3160 0.434 0.4988 0.818 0.818 53% 61% SCOTLAND GIBSON Bedrock Wells 787 820 0.096 0.099 0.295 0.295 33% 34% LAURINBURG Bedrock Wells 15907 18104 2.841 4.659 3.59 6.19 79% 75% LAURINBURG/MAXTON AIRPORT Bedrock Wells 31 31 1.436 2.29 2.03 72% 113% SCOTLAND 0.007 0.034 0.3 0.3 72% 114%		MAXTON / ROWI AND / PARKTON / SAINT PAL	II S	00200	0.002	101020	12.0			10/0
ST. PAULS Black Creek & Upper Cape Fear Aquifers 2900 3160 0.404 0.4988 0.818 0.818 53% 61% SCOTLAND GIBSON Bedrock Wells 787 820 0.096 0.099 0.295 0.295 33% 34% LAURINBURG Bedrock Wells 15907 18104 2.841 4.659 3.59 6.19 79% 75% LAURINBURG/MAXTON AIRPORT Bedrock Wells 31 31 1.436 2.29 2.03 72% 113% SCOTLAND 31 31 0.007 0.034 0.3 0.3 7% 11%	ROWI AND	Black Creek Aquifer	1180	1400	0.25	0.282	0 576	0 576	43%	49%
SCOTLAND Bedrock Wells 787 820 0.096 0.099 0.295 0.295 33% 34% LAURINBURG Bedrock Wells 15907 18104 2.841 4.659 3.59 6.19 79% 75% LAURINBURG/MAXTON AIRPORT Bedrock Wells 31 31 1.436 2.29 2.03 2.03 72% 113% SCOTLAND CO N LAURINBURG / MAXTON AIRPORT Bedrock Wells 31 31 1.436 2.29 2.03 2.03 72% 113%	ST PALIES	Black Creek & Unner Cane Fear Aquifers	2900	3160	0.434	0.4988	0.818	0.818	53%	61%
GIBSON Bedrock Wells 787 820 0.096 0.099 0.295 0.295 33% 34% LAURINBURG Bedrock Wells 15907 18104 2.841 4.659 3.59 6.19 79% 75% LAURINBURG/MAXTON AIRPORT Bedrock Wells 31 31 1.436 2.29 2.03 2.03 72% 113% SCOTLAND CO N LAURINBURG (MAXTON AIRPORT LAURINBURG (MAXTON AIRPORT AUTH 2100 2235 0.007 0.034 0.3 0% 11%	SCOTLAND	Black Oreck & Opper Dape I car Aquiers	2300	5100	0.404	0.4000	0.010	0.010	5570	0170
LAURINBURG Bedrock Wells 1507 18104 2.841 4.659 3.59 6.19 79% 75% LAURINBURG/MAXTON AIRPORT Bedrock Wells 31 31 1.436 2.29 2.03 2.03 72% 113% SCOTLAND CO N LAURINBURG (MAXTON AIRPORT LAURINBURG (MAXTON AIRPORT 2100 2235 0.007 0.034 0.3 0.3 2% 11%	GIBSON	Bedrock Wells	787	820	0.096	0 099	0 295	0 295	33%	34%
LAURINBURG/MAXTON AIRPORT Bedrock Wells 31 31 1.436 2.29 2.03 2.03 72% 113% SCOTI AND CO N LAURINBURG / MAXTON AIRPORT ALITH 2100 2235 0.007 0.034 0.3 0.3 2% 11%	LAURINBURG	Bedrock Wells	15907	18104	2 841	4 659	3 59	6 19	79%	75%
SCOTI AND CO N LAURINBURG / MAXTON AIRPORT AUTH 2100 2235 0.007 0.034 0.3 0.3 2% 11%		Bedrock Wells	31	31	1 436	2 29	2.03	2.03	72%	113%
	SCOTLAND CO N		2100	2235	0.007	0.034	0.3	0.3	2%	11%
SCOTTAND CO S LAURING IN A COLLAR COLLA	SCOTLAND CO S		643	685	0.007	0.034	0.0	0.5	2%	3%
WAGE DAM Badrak Walk 823 053 0.022 0.033 1 1 2% 3%	WACRAM	Bedrock Wells	823	000	0.022	0.033	0.165	0 165	270	5/%
* 1007 IWSP not submitted 1002 data used in analysis	* 1997 I W/SP not submitted -1992 data used in a		023	900	0.07	0.0003	0.105	0.105	4370	54 /0