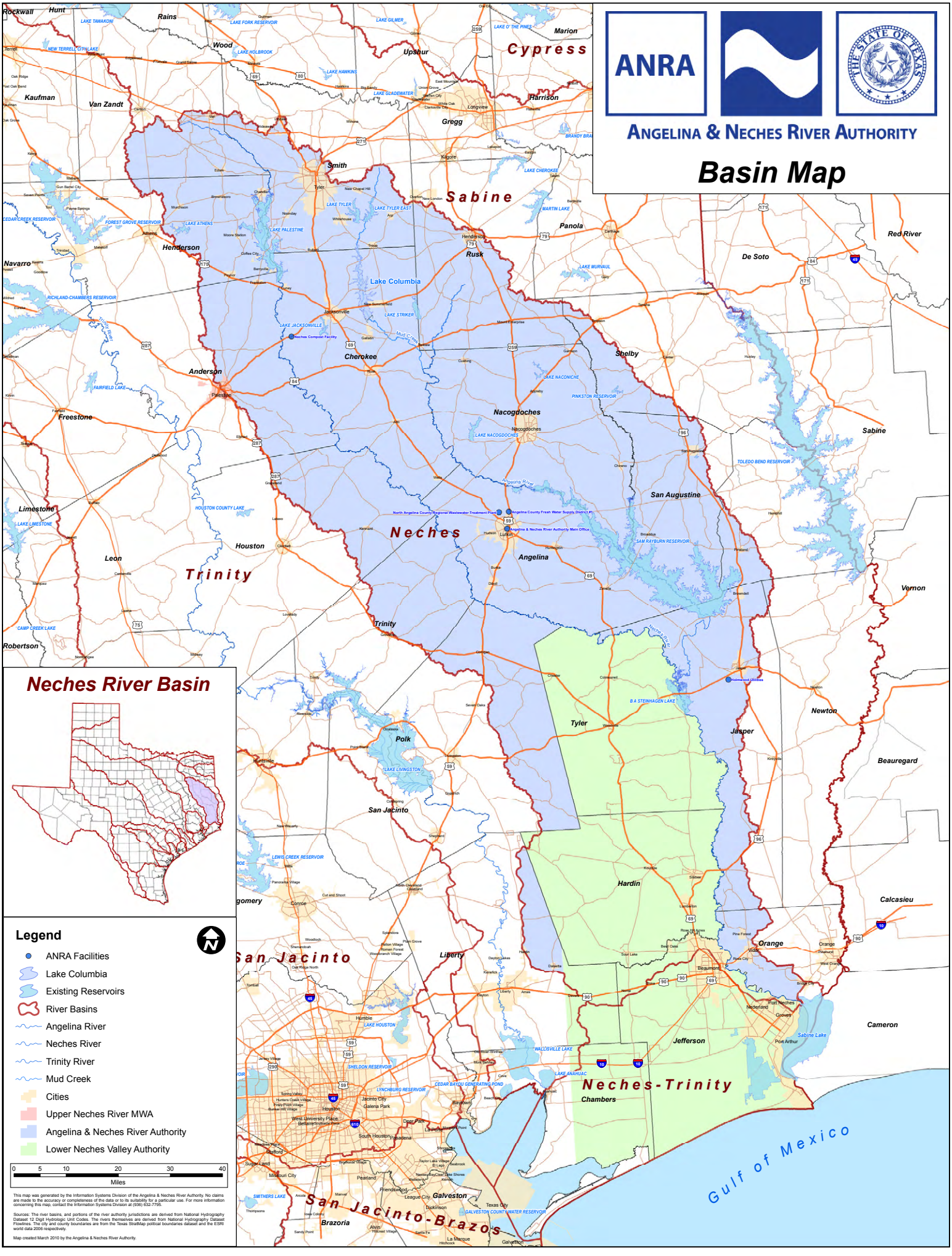
Water Conservation and Drought Contingency Plan

ANRA

Angelina & Neches River Authority



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Sources: The river basins, and portions of the river authority jurisdictions are derived from National Hydrography Dataset 12 Digit Hydrologic Unit Codes. The rivers themselves are derived from National Hydrography Dataset Flowlines. The city and county boundaries are from the Texas StratMap political boundaries dataset and the ESRI world data 2006 respectively.

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1.0 Purpose and Evaluation

This Water Conservation and Drought Contingency Plan sets forth measures currently in place and to be taken by the Angelina & Neches River Authority (ANRA) to ensure compliance with applicable state law and to provide guidance for implementation of a drought contingency plan should a water supply shortage develop.

The plan describes ANRA's approach to promote efficient water use and to effectively manage its water resources. The plan has been developed with the overall goal of increasing the effective and efficient use of water while maintaining an environment acceptable to the citizens of the Neches Basin. The specific objectives are to:

1. Develop a conservation plan to extend the period of time before an additional long-term water supply source will be needed;
2. Develop a drought contingency plan for use during emergencies; and
3. Identify and evaluate supplemental water supply sources.

For ANRA to achieve these goals, it will be necessary that all economically efficient water conservation measures be pursued and reliable cost-effective long and short-term alternative water supply sources be identified. Since ANRA is involved in suppling water on wholesale and retail levels, both types of water treatment and transmission systems must be addressed.

ANRA will employ the use of water meters, leak detection programs, pressure reduction, plumbing fixture requirements, escalating rate structures, education and enforcement activities as part of it's implementation strategy.

The drought contingency plan provides for authorization procedures, a description of prohibited and regulated water uses, provisions for allocation of water, and penalty and enforcement processes. An essential part of a drought management program is to ensure the customers are aware of restrictions, rationing procedures and penalties for violations. It is also essential that a drought condition be described accurately. Exaggerated reporting of a condition can create an unfavorable long-term economic climate for the area. Procedures for working with news media and the public are discussed.

2.0 Water Conservation Goals

Specific, quantified five-year and ten-year targets for water savings have been developed. These include goals for wholesale and retail customers in terms of system losses and in gallons per capita (per person) per day (gpcd). While ANRA maintains direct control over its retail customers, the goals established by ANRA's wholesale customers are not directly enforceable.

Wholesale Water Supply
System Water Loss Goals are:

5 year	10% reduction	Reduce water loss to less than 15% of production
10 year	5% reduction	Reduce water loss to less than 5% of production

Gallons per capita per day (gpcd) goals:

5 year	15% reduction	Reduce consumption to no greater than 15% of the approved Regional Water Plan average per capita consumption
10 year	10% reduction	Reduce consumption to no greater than 10% of the approved Regional Water Plan average per capita consumption

Retail Water Supply
System Water Loss Goals are:

5 year	10% reduction	Reduce water loss to less than 15% of production
10 year	5% reduction	Reduce water loss to less than 5% of production

Gallons per capita per day (gpcd) goals:

5 year	5% reduction	Reduce consumption from 127 gpcd to 121 gpcd
10 year	5% reduction	Reduce consumption from 121 gpcd to 114 gpcd

3.0 Implementation and Monitoring

ANRA will utilize escalating rate structures, public education and awareness programs, leak detection and monitoring programs as well as data reporting to assist in achieving water conservation goals. As part of the ongoing data collection process, ANRA will adhere to the following schedule to achieve the targets and goals expressed for water conservation:

- Calibrations of meters for all treated water deliveries are conducted semi-annually
- Water meters will continue to be monitored for accuracy annually and replaced on a fifteen-year or one million gallon cycle at a minimum
- Water audits are conducted annually
- Real water losses are identified and corrected
- Real water losses are minimized by replacement of deteriorating water mains and appurtenances, as is conducted by ANRA staff on an on-going basis
- ANRA will mail out material developed by the staff, materials obtained from the Texas

Water Development Board, Texas Commission on Environmental Quality or other sources semi-annually (once in the spring and once in the summer) to all customers

ANRA staff will track targets and goals by utilizing the following procedures:

- Logs shall be maintained for meter calibration, meter testing, and meter replacement programs
- Annual water audits shall be documented and kept in the Utility Department files
- Staff shall keep a record of the number of mail-outs distributed semi-annually
- Rates are tracked by means of ordinances adopted
- Logs shall be maintained for the utility's Leak Detection Program, including but not limited to: annual inspections and soundings of all water main fittings and connections, and annual intermittent night-flow measurements

4.0 Universal Metering

ANRA meters all delivery points unless circumstances dictate that delivery not be metered, in such cases, standardized assumptions will be used. All aspects of the water metering program contribute to ANRA's comprehensive water conservation effort.

ANRA measures the raw water diverted to the Water Treatment Plant, pumped by well pumps, depending on the source, and meters all of the raw and treated water produced before it goes into the Distribution System. All water users taking water from the treated water system are metered at their respective point of entry. Metering provides an accurate accounting of water used in the system and is essential for establishing conservation oriented rate structures. ANRA will maintain ownership and control over the water meters.

ANRA maintains a program of replacing water meters on a regular basis. Two-inch through four-inch meters are tested annually and as needed. Master meters and meters which are larger than four inches will be tested at six month intervals. ANRA estimates that regular testing of water meters which are smaller than one and-a-half inches in diameter is uneconomical. However, the accuracy of all water meters is tracked by consumption reports in ANRA's water utility database. If consumption changes significantly, analysis and corrective action will be taken.

ANRA replaces meters as soon as a problem is detected. Meters which are larger than one and-a-half inches are repaired as needed. An acceptable accuracy level for all meters is plus or minus two percent.

5.0 Control Measures

ANRA meters each water connection at the point of entry for each water customer. Each retail water meter is read on a monthly basis at a minimum, with wholesale master meters and

other flow recording devices read on a daily basis. Data from all master meters and flow measuring devices are compiled on an ongoing basis for accounting and audit purposes. Water consumption data is reported to each retail and wholesale customer on a monthly basis. In the case of wholesale and Industrial customers, water consumption data is reported more frequently during periods of water shortages.

6.0 Leak Detection and Reporting

To control the level of Unaccounted-For water, ANRA maintains a constant watch for leaks in the distribution system by maintaining a 24 hour, 365 day dispatching service to assist the general public in reporting any item that pertains to the water system. This type of reporting has been extremely productive in locating leaks that have not risen to the surface or other unaccounted uses of water.

ANRA is staffed to address immediate concerns, i.e. leaks in the system and to initiate permanent solutions to the infrastructure. Repair crews are on call 24 hours per day, seven days a week, to respond to reports of leaks on mains and services. The water transmission and distribution systems are under routine observation for leaks both by ANRA personnel and the public. ANRA requires all new water facilities to be built to strict specifications based upon Local, State, and Federal standards.

7.0 Water Conservation Education

ANRA maintains a public education and information program to promote water conservation to basin residents. Programs target both young and adult audiences. ANRA also maintains a web site through which distribution of educational materials are included. Public awareness is the first step to demand side management.

School programs are the cornerstone of this activity. Education has been provided through the Texas Watch Education Program developed under the sponsorship of the Clean Rivers Program, which ANRA administers for the basin. This program is geared to elementary school students.

ANRA provides written information published by the Texas Water Development Board and others sources concerning water conserving landscaping and other outdoor water saving activities. This information is available to city officials and retail customers.

ANRA also has information available for plumbers and customers to use when purchasing and installing plumbing fixtures, lawn watering equipment, or water using appliances. Information regarding retrofit devices such as low-flow shower heads or toilet dams that reduce water use by replacing or modifying existing fixtures or appliances is also provided.

8.0 Water Rate Structure

In general, each customer is charged for the volume of water used and each customer is billed a minimum monthly rate. The rate increases with the size of the customer's meter and the rates per thousand increase as the volume increases. Wholesale and retail water customer rate structures are cost based and because they are an escalating structure, they promote conservation. For specific rate structures, see Appendices B, C & D.

9.0 Implementation and Enforcement

The adoption of this plan is authorized by ANRA's Board of Directors by Resolution (see Appendix A). The adoption of this plan extends to all wholesale contracts and retail utilities owned by ANRA.

10.0 Regional Planning Group Coordination

ANRA's service area is its 17 county jurisdiction located within the Neches River basin. These counties include all or part of Angelina, Anderson, Cherokee, Henderson, Houston, Jasper, Nacogdoches, Newton, Orange, Polk, Rusk, Sabine, San Augustine, Shelby, Smith, Trinity and Van Zandt counties. These counties reside solely within the boundaries of the East Texas Regional Water Planning Group, Region I. A copy of this water conservation plan has been provided to the Texas Water Development Board and Region I.

11.0 Drought Contingency Plan

The goal of ANRA's drought contingency plan is to balance the competing needs for water and minimize the adverse effects of water shortages during periods of drought. ANRA's drought contingency plan addresses the steps to be taken by ANRA when drought conditions occur and when it appears the existing water supply may not be sufficient to meet all of the existing needs without some type of restrictions.

The General Manager or his/her designee shall monitor water supply and/or demand conditions on a daily basis and, in accordance with the triggering criteria set forth in Appendices B, C & D of this Plan, shall determine that a mild, moderate, severe, critical, emergency or water shortage condition exists and shall implement the following notification procedures:

The General Manager or his/her designee shall notify the public by means of any combination determined most appropriate of the following: publication in a newspaper of general circulation, direct mail to each customer, public service announcements, and/or signs posted in public places.

The General Manager or his/her designee shall notify directly, or cause to be notified directly, the following individuals and entities of affected parties: Mayors of participant Cities, City and/or County Emergency Management Coordinator(s), County Judge & Commissioner(s) and Texas Commission on Environmental Quality.

The following steps will be taken, starting when drought conditions appear to worsen, a trigger condition is met or another emergency demand situation arises. The plan proposes to meet a drought situation through a series of monitored demand levels, water conservation and rationing steps supplemented by increasing supply through alternative water source. ANRA will make a declaration at each demand level and begin implementation of the strategic measures associated with each condition.

Drought Condition - Water Conservation

Condition I: Water Shortage Possibility (water demand at 80% of capacity for 5 days).

1. Daily monitoring of ground water and surface water levels.

2. Check operation of wells, intake structures and pump stations for mechanical or electrical problems. Determine that all infrastructure is operable. Put backup water supply sources in service when needed, to maintain supply.

3. Discuss water conservation and rationing possibility with wholesale customers which have independent supplies.

4. Request voluntary conservation of water by all users.

5. Investigate alternative water sources:
   a. Inventory existing and shut-in wells;
   b. Connection to adjacent sources;
   c. Importation;
   d. Other

Condition II: Water Shortage Watch (water demand at 90% of capacity for 3 days).

1. All strategies listed in Condition I.

2. Mandatory restriction of outdoor water uses such as car washing, landscape irrigation, dust control and other exterior uses. Customers are required to limit exterior water use to Sundays and Thursdays for customers with a street address ending in an even number (0, 2, 4, 6 or 8), and Saturdays and Wednesdays for water customers with a street address ending in an odd number (1, 3, 5, 7 or 9), and to irrigate landscapes only between the hours of 8:00 p.m and 8:00 a.m. on designated watering days.

3. Mandatory restriction of dead end flushing.

3. Restrict use of fire hydrants for any use other than fire fighting.

4. Establish committee of wholesale customers to review policies and provide recommendations.

Condition III: Water Shortage Warning (water demand at 95% of capacity for 1 day).

1. All strategies listed in Conditions I & II.

2. Prohibit new connections to distribution system.

3. Mandatory reduction of normal water use by industrial and commercial customers. Prohibit Outdoor watering of any type. Agricultural exemptions may be granted on a case by case basis. All requests for exemptions must be made in writing prior to use of water.

4. Limit residential customer use without rate penalty. Set new rate schedule to discourage overuse.

5. Install flow restricting devices where applicable.

Condition IV: Water Shortage Emergency (water demand equals capacity).

1. All strategies listed in Conditions I, II, & III.

2. Establish maximum monthly use for residential meters, the amount dependent upon alternative water supply available. Revise rate schedules to discourage unnecessary consumption.

3. Lock all meters (where applicable). Ration water through limited or intermittent pumping schedules in order to maintain sanitary conditions.

4. ANRA to take those actions deemed necessary to meet the conditions resulting from the emergency.

5. Install flow restrictors on all remaining water meters.

Condition V: Water Shortage Crisis (water demand exceeds capacity)

1. All strategies listed in Conditions I, II, III, & IV.

2. Issue Boil Water Notices to all affected customers.

3. Maintain a limited pumping schedule for sanitary purposes.

Drought Condition - Water Supply Enhancement

Temporary Connection to Adequate Surface Water Supply

Where feasible, a temporary connection to an adequate surface water supply to replace the groundwater source is considered a potential water supply enhancement where applicable.

Trucking Fresh Water

The feasibility of trucking potable water to area customers was considered. It was determined this option is viable for immediate emergency relief, but not feasible for extended supply. The advantages of this option are the ability to make available limited quantities of potable water very quickly with minimal construction costs. Distribution would be by container to customers at truck stops located in the areas to be served. Disadvantages are the limited amount of water that could be made available and the cost.

Education and Information

Once trigger conditions and emergency measures have been established, the public must be informed as to what will be expected during a drought or emergency situation. The material should describe trigger conditions and emergency measures and the need to implement the measures. Methods of educating and informing the public include:

1. Radio and television public service announcements and news stories;
2. Newspaper stories;
3. Letters, bill stuffers, and brochures to water customers;
4. Other innovative methods.

Appendix A

Appendix B

Wholesale Customers
Drought Contingency Plan

Total Capacity

Raw Water Based on wholesale contract for each customer

Condition Level Triggers

Condition I: Water Shortage Possibility (water demand at 80% of capacity for 5 days).

Condition II: Water Shortage Watch (water demand at 90% of capacity for 3 days).

Condition III: Water Shortage Warning (water demand at 95% of capacity for 1 day).

Condition IV: Water Shortage Emergency (water demand equals capacity).

Condition V: Water Shortage Crisis (water demand exceeds capacity)

Appendix C

Holmwood Utilities
Drought Contingency Plan

Total Capacity

Raw Water	185 gallons per minute, or 266,400 gallons per day
Ground Storage	66,000 gallons, or maximum retention time of 8.0 hours
Booster Pumps	600 gallons per minute, or 266,400 gallons per day (limited by raw water supply)

Condition Level Triggers

Condition I: Water Shortage Possibility (water demand at 80% of capacity for 5 days).

- Raw Water Capacity- 148 gallons per minute or 213,120 gallons per day
- Ground Storage Tank- 13,200 gallons or 96 minutes of retention time remaining
- Booster Pump- 480 gallons per minute or 213,120 gallons per day (limited by raw water supply)

Condition II: Water Shortage Watch (water demand at 90% of capacity for 3 days).

- Raw Water Capacity- 161 gallons per minute or 239,760 gallons per day
- Ground Storage Tank- 6,600 gallons or 48 minutes of retention time remaining
- Booster Pump- 540 gallons per minute or 239,760 gallons per day (limited by raw water supply)

Condition III: Water Shortage Warning (water demand at 95% of capacity for 1 day).

- Raw Water Capacity- 175 gallons per minute or 253,080 gallons per day
- Ground Storage Tank- 3,300 gallons or 24 minutes of retention time remaining
- Booster Pump- 570 gallons per minute or 253,080 gallons per day (limited by raw water supply)

Condition IV: Water Shortage Emergency (water demand equals capacity).

- Raw Water Capacity- 185 gallons per minute or 266,400 gallons per day
- Ground Storage Tank- 0 gallons or 0 minutes of retention time remaining
- Booster Pump- 600 gallons per minute or 266,400 gallons per day (limited by raw water supply)

Condition V: Water Shortage Crisis (water demand exceeds capacity)

- Raw Water Capacity- 185 gallons per minute or 266,400 gallons per day
- Ground Storage Tank- 0 gallons or 0 minutes of retention time remaining
- Booster Pump- 600 gallons per minute or 266,400 gallons per day (limited by raw water supply)

Holmwood Utilities
Retail Rate Structure

Description	New Rate	
	5/8" x 3/4" water meter	1" water meter
Water		
Fixed Rate with 3,000 gallons	$ 41.41	$46.41
Variable Rate (per 1,000) 3,000 - 10,000 gallons	$ 1.49	$ 1.49
Variable Rate (per 1,000) 10,000 gallons and above	$ 2.50	$ 2.50
Sewer		
Fixed Rate with 3,000 gallons	$ 37.01	$ 42.01
Variable Rate (per 1,000) 3,000 - 7,000 gallons	$ 3.44	$ 3.44
Variable Rate (per 1,000) 7,000 gallons and above	No Charge	No Charge

Appendix D

Angelina County Fresh Water Supply District #1
Drought Contingency Plan

Total Capacity

Wholesale Purchase Contract 500 gallons per minute or 216,000 gallon per day

Condition Level Triggers

Condition I: Water Shortage Possibility (water demand at 80% of capacity for 5 days).

- Wholesale Purchase Contract - 400 gallons per minute or 172,800 gallons per day

Condition II: Water Shortage Watch (water demand at 90% of capacity for 3 days).

- Wholesale Purchase Contract - 450 gallons per minute or 194,400 gallons per day

Condition III: Water Shortage Warning (water demand at 95% of capacity for 1 day).

- Wholesale Purchase Contract - 475 gallons per minute or 205,200 gallons per day

Condition IV: Water Shortage Emergency (water demand equals capacity).

- Wholesale Purchase Contract - 500 gallons per minute or 216,000 gallons per day

Condition V: Water Shortage Crisis (water demand exceeds capacity)

- Wholesale Purchase Contract - 500 gallons per minute or 216,000 gallons per day

Angelina County Fresh Water Supply District #1
Retail Rate Structure

Description	New Rate	
	5/8" x 3/4" water meter	1" water meter
Water		
Fixed Rate with 3,000 gallons	$ 27.83	$32.83
Variable Rate (per 1,000) 3,000 - 10,000 gallons	$ 2.57	$ 2.57
Variable Rate (per 1,000) 10,000 gallons and above		
Sewer		
Flat Rate	$ 47.42	$ 47.42