

Chapter 6

Water Conservation and Drought Management

Recommendations

Water conservation is defined by Texas Water Code 11.002.8 as the development of water resources and those practices, techniques and technologies that will reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water and increase the recycling and reuse of water to be made available for future or alternative uses. Water conservation plans are long-term, permanent strategies to reduce water use. Drought contingency plans are similar to conservation plans in that they aim to reduce water use, but are only intended for temporary periods during drought conditions.

Some water demand projections incorporate an expected level of conservation to be implemented over the planning period. For municipal use, the assumed reductions in per capita water use are the result of the implementation of the State Water-Efficiency Plumbing Act. On a regional basis, this is about an 8 percent reduction in municipal water use (23,860 ac-ft per year) by year 2060. Additional municipal water savings may be expected as the Federal mandate for low flow clothes washing machines took effect in 2007.

Conservation savings were also included in the steam-electric power demands. Demands for steam-electric power were developed with the assumption that long-term power needs will be met with more water-efficient facilities. The estimated water savings associated with the higher efficiency power plants is nearly 27 percent of the total demands or 57,100 ac-ft per year in the ETRWPA. Reductions in demands due to conservation were not quantified by the TWDB for manufacturing, mining, irrigation and livestock needs.

SB1 requires each region's water plan to address drought management and conservation for both groundwater and surface water supply sources.

The ETRWPA is a water-rich region and water conservation in the region is driven by economics and not by lack of water supply. The ETRWPG believes that water users in the ETRWPA will implement advanced water conservation measures (i.e. savings associated with active conservation measures) as economic conditions dictate to each individual user. Given the general abundance of accessible water supply to the water users in the ETRWPA, the ETRWPG believes the conservation strategies included in this planning period represent an economically achievable level of conservation. Currently, over one fourth of the municipal water users in the ETRWPA have per capita water use less than 100 gallons per person per day and 57 percent are less than the Water Conservation Task Force recommended state average of 140 gallons per person per day. While municipal use represents about 20 percent of the total regional water demands, the potential savings from advanced municipal conservation are relatively small. This opinion may change as economics and water supply conditions change in East Texas.

6.1 Water Conservation Plans

The TCEQ requires water conservation plans for all municipal and industrial water users with surface water rights of 1,000 ac-ft per year or more and irrigation water users with surface water rights of 10,000 ac-ft per year or more. Water conservation plans are also required for all water users applying for a State water right, and may also be required for entities seeking State funding for water supply projects. Legislation passed in 2003 requires all conservation plans to specify quantifiable 5-year and 10-year conservation goals and targets. While these goals are not enforceable, they must be identified. Updated water conservation plans for WUGs in the region were to be submitted to the Executive Director of the TCEQ and to the ETRWPG by May 1, 2009.

In the ETRWPA, 28 entities hold municipal or industrial rights in excess of 1,000 ac-ft per year and three entities have irrigation water rights greater than 10,000 ac-ft per year. A list of the users in the ETRWPG required to submit water conservation plans is

shown in Table 6.1. Others have contracts with regional and wholesale water providers for greater than 1,000 ac-ft per year.

Presently, these water users are not required to develop water conservation plans unless the user is seeking State funding; however, a wholesale water provider may request that its customers prepare a conservation plan to assist in meeting the goals and targets of the wholesale water provider's plan.

To assist entities in the ETRWPA with developing water conservation plans, model plans for municipal water users (wholesale or retail public water suppliers), industrial users and irrigation districts may be found on the TCEQ website at http://www.tceq.state.tx.us/permitting/water_supply/water_rights/conserve.html. Each of these model plans addresses the latest TCEQ requirements and is intended to be modified by each user to best reflect the activities appropriate to the entity.

Water conservation strategies vary by water user and are shown in Table 6.2. This table lists water conservation strategies for individuals who have submitted water conservation plans as of August 25, 2009. The focus of the conservation activities for municipal water users in the ETRWPA are:

- Education and public awareness programs.
- Reduction of unaccounted for water through water audits and maintenance of water systems.
- Water rate structures that discourage water waste.

Industrial water users include large petrochemical industries as well as smaller local manufacturers. Conservation activities associated with industries are very site and industry-specific. Some industries can utilize brackish water supplies or wastewater effluent while others require only potable water. It is important in evaluating conservation strategies for industries to balance the water savings from conservation to economic benefits to the industry and the region.

**Table 6.1 Water Users and Types of Use that are Required to have
Water Conservation Plans**

Municipal/Domestic	Industrial	Mining	Other	Irrigation Water Users
Angelina & Neches River Authority *	Angelina & Neches River Authority*	United States Department of Energy	Jefferson Co. Drainage District No. 6	Sabine River Authority
Athens Municipal Water Authority*	Angelina-Nacogdoches WCID No.1		Texas Parks and Wildlife Department	Joe Broussard
City of Beaumont	Athens Municipal Water Authority		M Half Circle Ranch Company	
City of Center	City of Lufkin			
City of Jacksonville	E I Dupont De Nemours & Co			
City of Lufkin*	Entergy Texas, Inc.			
City of Nacogdoches	Exxon Mobil Oil Company			
Houston Co WCID No. 1	Independent Refining Corp.			
Lower Neches Valley Authority	Luminant Generation Co. LLC			
Panola Co FWSD No. 1	Panola Co FWSD No. 1			
Sabine River Authority*	Premcor Refining Group, Inc.			
City of Tyler*	Sabine River Authority			
Upper Neches River MWD	Temple-Inland Forest Prod Corp			
	Texas Petrochemicals LP			
	City of Tyler			
	Union Oil of California			

* Water users with multiple types of use.

Table 6.2 Primary Water Conservation Strategies Documented in Water Conservation Plans

Water User Group	Primary Water Conservation Strategies								
	Plumbing Fixture Requirements	Reduce Water Loss/Leak Detection	Public Education/Awareness Programs	Pressure Control	Universal Metering or Meter Calibration or Replacement	Rate Structure Not Promoting Excessive use	Retrofit Program/2003 International Plumbing Code	Require/Request retail water suppliers to have conservation plan/conservation strategies	Other
	Passive Strategies	Active Conservation Strategies							
Angelina & Neches River Authority	●	●	●	●	●	●		●	●
Angelina-Nacogdoches WCID No.1		●							
City of Beaumont	●	●	●		●				●
City of Jacksonville	●	●	●	●	●		●	●	●
City of Lufkin	●	●	●		●	●	●	●	●
City of Nacogdoches	●	●	●		●	●			
Entergy Texas, Inc.		●							●
Houston Co WCID No.1		●	●		●			●	●
Luminant Generation Co. LLC		●							
Sabine River Authority		●			●			●	●
United States Dept of Energy		●							●
Upper Neches River MWD	●	●	●		●		●	●	●

In the ETRWPA, where water is readily available, requiring costly changes to processes and equipment may not be practical and beneficial to the region. In light of these considerations, the focus of the conservation activities for industrial users is:

- Evaluation of water saving equipment and processes.
- Water rate structures that discourage water waste.

Most irrigation occurs in the lower parts of the Neches and Sabine Basins. Much of the irrigation water is delivered by canals and is used for rice farming along the coast. Appropriate conservation activities for the large irrigators in the ETRWPA include the following:

- Reduction in operational losses and losses associated with conveyance systems.
- Coordination of irrigation deliveries to maximize efficiencies (tailwater recovery).
- Encourage water saving irrigation equipment and land practices for customers (e.g., land leveling).

6.2 Water Trends

The State of Texas Water Conservation Implementation Task Force (WCITF) has set a recommended goal of an average per capita consumption of 140 gpcd for water suppliers. Based on a study conducted in Phase I Round 3 of Regional Water Planning, water use in the ETRWPA is well below the target value.

Study No. 3, “Study of Municipal Water Uses to Improve Water Conservation Strategies and Projections,” reviewed water production and sales surveys, which were sent to 65 WUGs in the ETRWPA with approximately 1,000 connections or more. Residential and total water production and water use were calculated from the survey responses. Median residential water use and median total water production for all but two of the responding 27 WUGs demonstrated water use below 140 gpcd. Median

residential water use for the region was calculated to be 68 gpcd. Based on total water production, median water use was 86 gpcd.

The City of Tyler and City of Woodville demonstrated median residential water sales above the target value at 177 and 311 gpcd, respectively. The City of Tyler is required to submit a water conservation plan and drought contingency plan to the TCEQ and RWPG. As of August 28, 2009, plans for water conservation and drought contingency were not received. Based on water supply and water demand for the City of Tyler, the city does not demonstrate a need through the end of the planning period and does not require additional water conservation strategies.

It must be recognized that long-term changes to water supplies can be brought on by impacts on water quality or quantity, or by changing economic conditions. Such changes could require additional emphasis on water conservation in the future. The need for additional water conservation will continue to be evaluated in future plans.

6.3 Drought Contingency Plans

Drought management is a temporary strategy to conserve available water supplies during times of drought or emergencies. This strategy is not recommended to meet long-term growth in demands, but rather acts as a means to minimize the adverse impacts of water supply shortages during drought. The TCEQ requires drought contingency plans for wholesale water suppliers and irrigation districts, as well as retail public water suppliers serving 3,300 or more connections. A drought contingency plan may also be required for entities seeking State funding for water projects.

Drought contingency plans typically identify different stages of drought and specific triggers and responses for each stage. In addition, the plan must specify quantifiable targets for water use reductions for each stage, and a means and method for enforcement. As with the water conservation plans, drought contingency plans are to be updated and submitted to the TCEQ and ETRWPG by May 1, 2009.

Model drought contingency plans address the latest regulations and TCEQ requirements for retail and wholesale public water suppliers, irrigation districts, water supply corporations and investor owned utilities. Model plans may be found at http://www.tceq.state.tx.us/permitting/water_supply/water_rights/contingency.html. Each plan identifies three to six drought stages: mild, moderate, severe, critical and emergency. The recommended responses range from notification of drought conditions and voluntary reductions in the “mild” stage to mandatory restrictions during an “emergency” stage. Each entity will select the trigger conditions for the different stages and appropriate response.

The majority of the drought contingency plans in the ETRWPA use trigger conditions based on a combination of water supply and demands placed on the water distribution system. A list of water users that are required by Texas Water Code 12.1272 to submit a drought contingency plan are included in Table 6.3. Table 6.4 lists triggers and drought response stages for individuals who submitted drought contingency plans by August 28, 2009. All plans include water conservation measures which range from voluntary water restrictions in Stage I to mandatory restrictions in the final stage. Some drought contingency plans include an emergency stage not directly related to drought, but as a result of system rupture or failure. In these instances, they are listed as the final trigger stage.

Table 6.3 Water Users Required to Submit Drought Contingency Plans

Athens Municipal Water Authority	City of Orange
Angelina and Neches River Authority	City of Palestine
Angelina-Nacogdoches WCID	City of Port Arthur
City of Athens	City of Port Neches
City of Beaumont	City of Silsbee
City of Bridge City	City of Tyler
City of Carthage	GM WSC
City of Center	Houston County WCID No. 1
City of Crockett	Lumberton MUD
City of Groves	Lower Neches Valley Authority
City of Henderson	Orange County WCID 1
City of Jacksonville	Panola County Fresh Water Supply District No. 1
City of Jasper	Sabine River Authority
City of Lufkin	Southern Utilities Company
City of Nacogdoches	Upper Neches River Municipal Water Authority
City of Nederland	

Table 6.4 Drought Trigger Conditions and Strategies Documented in Drought Contingency Plans

Water User	Drought Contingency Strategies													
	Trigger based on:		Stage I		Stage II		Stage III		Stage IV		Stage V		Stage VI	
	Supply	Demand	Voluntary Measures	Mandatory Measures	Voluntary Measures	Mandatory Measures	Voluntary Measures	Mandatory Measures	Voluntary Measures	Mandatory Measures	Voluntary Measures	Mandatory Measures	Voluntary Measures	Mandatory Measures
Athens Municipal Water Authority*														
Angelina and Neches River Authority	•	•	•		•	•	•	•	•	•	•	•		
Angelina-Nacogdoches WCID	•		•		•	•	•	•	•	•				
City of Beaumont	•	•	•		•	•	•	•	•	•	•	•		
City of Bridge City	•		•		•	•	•	•	•	•	•	•		
City of Carthage	•	•	•		•	•	•	•						
City of Groves	•	•	•		•	•	•	•						
City of Henderson	•	•	•		•	•	•	•						
City of Jacksonville	•	•	•		•	•	•	•						
City of Lufkin	•		•		•	•	•	•						
City of Nacogdoches	•	•	•		•	•	•	•	•	•				
City of Nederland	•	•	•		•	•	•	•						
City of Orange	•	•	•		•	•	•	•						
City of Palestine	•	•	•		•	•	•	•						
City of Port Arthur	•	•	•		•		•	•						
City of Silsbee	•	•	•		•	•	•	•	•	•				
Houston County WCID No. 1	•	•	•		•	•	•	•	•	•				

Table 6.4 Drought Trigger Conditions and Strategies Documented in Drought Contingency Plans (Cont.)

Water User	Drought Contingency Strategies													
	Trigger based on:		Stage I		Stage II		Stage III		Stage IV		Stage V		Stage VI	
	Supply	Demand	Voluntary Measures	Mandatory Measures	Voluntary Measures	Mandatory Measures	Voluntary Measures	Mandatory Measures	Voluntary Measures	Mandatory Measures	Voluntary Measures	Mandatory Measures	Voluntary Measures	Mandatory Measures
Houston County WCID No. 1	●	●	●		●	●	●	●	●	●				
Lumberton MUD	●	●	●		●	●	●	●	●	●	●	●	●	●
Lower Neches Valley Authority	●		●		●	●	●	●						
Orange County WCID 1	●	●	●		●	●	●	●	●	●	●	●	●	●
Sabine River Authority	●		●		●	●	●	●	●	●	●	●		
Southern Utilities Company	●	●	●		●	●	●	●						
Upper Neches River Municipal Water Authority	●	●	●		●	●	●	●	●	●				

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