Chapter 7

DROUGHT RESPONSE INFORMATION, ACTIVITIES, AND RECOMMENDATIONS

Drought is a frequent and inevitable factor in the climate of Texas. Therefore, it is vital to plan for the effect that droughts will have on the use, allocation, and conservation of water in the State. Drought management measures have been incorporated as an increasingly important part of water planning at the local, regional and statewide levels. In 2009, the Texas Water Development Board (TWDB) published "Drought Management in the Texas Regional and State Water Planning Process" (http://www.twdb.texas.gov/publications/reports/contracted_reports/doc/0804830819_DroughtMgmt.pdf) which examines the potential benefits and drawbacks of including drought management as a regional water management strategy.

Prolonged drought conditions can have serious impacts on water supplies. Due to the potentially devastating effects of drought on both individuals and the State's economy, it is important that water suppliers and users consider the potential impacts of drought and develop robust plans to address supply or demand management under drought conditions.

Through the regional water planning process, requirements for drought management planning are found in Title 31 of the Texas Administrative Code (TAC), Part 10, Chapter 357, Subchapter D. TAC §357.42 includes requirements regarding drought response information, activities, and recommendations. This chapter examines these specific requirements and identifies significant drought impacts within the Region.

7.1 Drought(s) of Record in the Regional Water Planning Area (RWPA)

7.1.1 Overview

The severity of the recent 2011 drought has significantly impacted the lives of water users, providers and water managers who have been hard-pressed to find solutions to critical supply and demand issues. The severity of the impacts varies, but the overriding sense of urgency to create workable strategies and solutions has been acknowledged and acted upon Statewide. Therefore, it is critical in this and future planning cycles to address the impact that drought may have on the future use, allocation and conservation of water in the State.

There are different types of drought that have been defined in various ways; however, these definitions fall into four primary categories: meteorological, agricultural, hydrological and socioeconomic drought. In the most general sense, drought is a deficiency of precipitation over an extended period of time, resulting in a water shortage for some activity, group or environmental purpose. The State Drought Preparedness Plan provides more specific and detailed definitions and is located at the following link: https://www.dps.texas.gov/dem/CouncilsCommittees/droughtCouncil/droughtPrepPlan.pdf.

Meteorological drought is quantified by how dry it is (for example, a rain deficit) compared to normal conditions as well as the duration of the dry period. This is typically a region-specific metric, since factors affecting meteorological drought can vary so much in different regions.

Agricultural drought considers the effects of meteorological drought in terms of agricultural impacts. For example, evapotranspiration, soil moisture and plant stress are measures of agricultural drought, which account for vulnerability of crops through the various growth stages.

Hydrological drought is measured in terms of effects on surface and subsurface waters, such as reservoir stage and capacity, stream flow or groundwater levels in wells. Hydrological drought is usually defined on a river-basin or watershed scale. Hydrological droughts typically lag behind meteorological and agricultural droughts because it takes more time for the evidence of basin-wide impacts to manifest.

Socioeconomic drought occurs when the demand for an economic product (such as hydroelectric power) exceeds supply due to a weather-related deficit. Typically, demand for a good increases with population growth and per capita consumptions. Supply increases due to efficiency technology and the construction of new water projects. If both are increasing, the rate of change between supply and demand is the key. However, when demand exceeds supply, vulnerability is magnified by water shortages during drought.

Several climatological drought indicators have been formulated in order to quantify drought. The Palmer Drought Severity Index (PDSI) was developed in 1965 and is currently used by many federal and state agencies. The PDSI is a soil moisture index that works best in relatively large regions with uniform topography that don't experience extreme climate shifts. PDSI values can lag oncoming drought by several months. The TWDB uses the PDSI to monitor State drought conditions, which has values ranging between 6.0 (driest) to 6.0 (wettest). "Extreme drought" conditions have a PDSI between 6.0 and 4.0, and "severe drought" conditions have a PDSI between 3.99 and 3.0.

An accumulated area graph of the weekly PDSI categories for East Texas is included as Figure 7.1. The week of September 13, 2011 had the highest percent of the East Texas climate division experiencing exceptional drought (99 percent) for the period of record shown (January 2000 through January 2019). The U.S. Drought Monitor indicates that in September 2011, all of the counties in the North East Texas region experienced at least some periods of severe or extreme drought (see Figure 7.2).

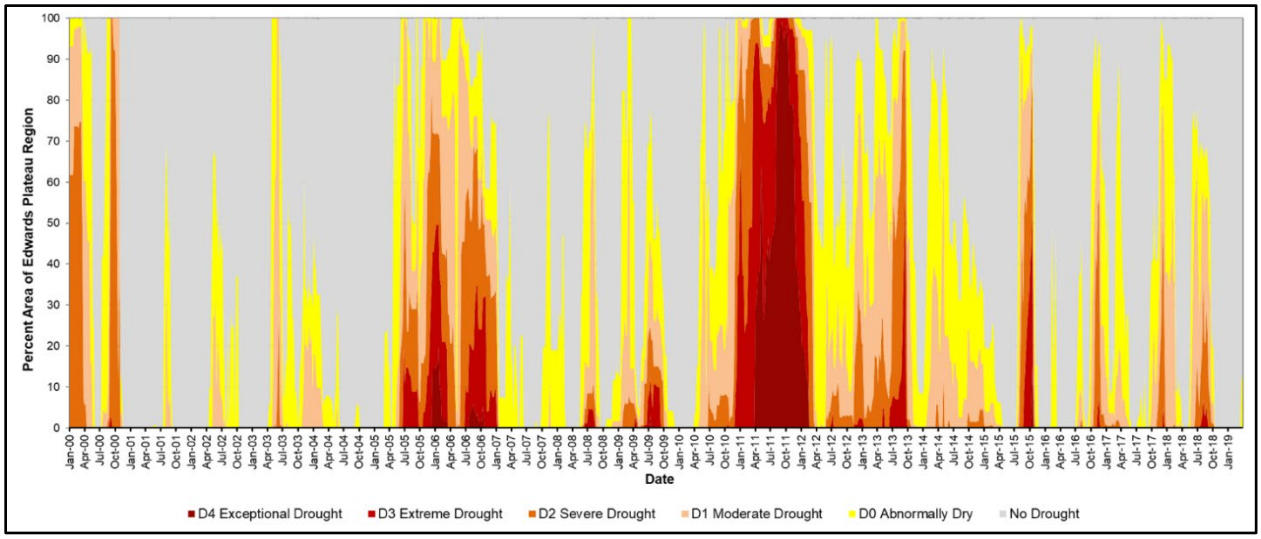

Figure 7.1 Drought in East Texas Climate Division, 2000 – 2019

(Source: U.S. Drought Monitor)

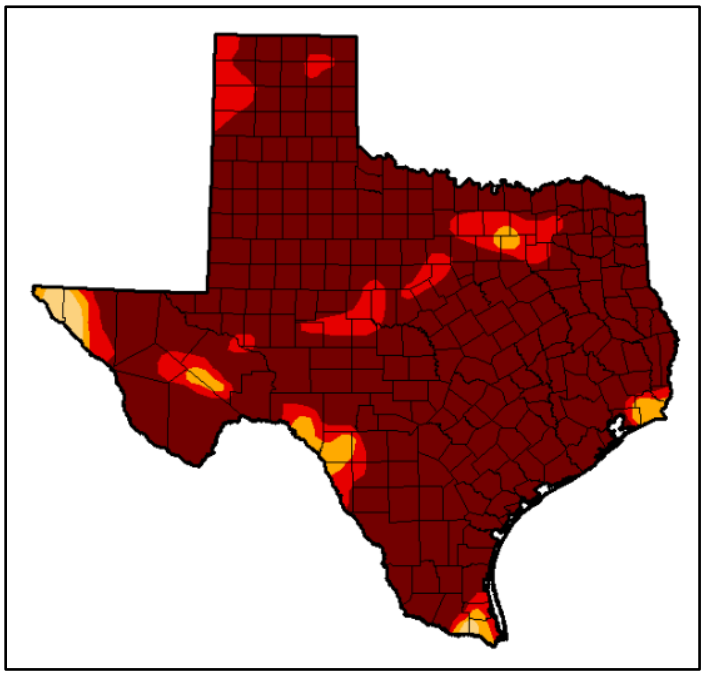

Figure 7.2 Drought in Texas, September 2011

Source: U.S. Drought Monitor

7.1.2 Droughts in the North East Texas Region

North East Texas is within the humid subtropical climate zone and receives the most rainfall of any region of Texas. Comparing the existing 1950's Drought of Record (DOR) and the more recent drought can be done using historic precipitation and the PDSI.

Precipitation data for TWDB defined quadrangles 412, 413, 512 and 513 from 1940 through 2018 are shown in Figure 7.3. These four quadrangles collectively cover the entire RWPA. The average annual rainfall for these quadrangles is 47 inches. These data indicate that the DOR during this period was in the 1950s as indicated by five out of six years of below average rainfall between 1951 and 1956. Note that a recurrence, or continuation, of the drought of the 1950s is also evident between 1962 and 1965.

The recent drought indicates a possible trend toward below average annual rainfall beginning around 1995, but also shows a relatively high-amplitude fluctuation from one year to the next, including the highest rainfall total during this period in the year 2015. The low in 2005 is also more extreme than the 1950s DOR. Years with below average rainfall may have a deficit of about 10 to almost 20 inches for the year. As shown in Figure 7.4, the PDSI values indicate similar patterns as the average annual precipitation data except the years may vary because the PDSI incorporates different factors.

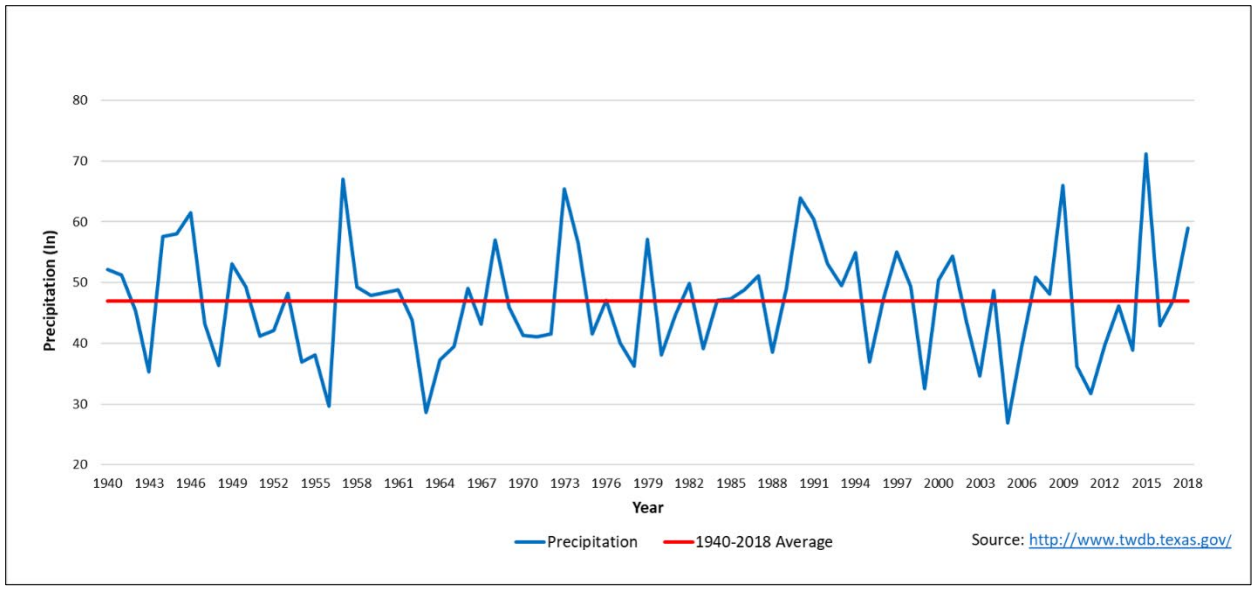

Figure 7.3 Annual Precipitation, 1940 – 2018, TWDB

Source: (https://waterdatafortexas.org/lakeevaporationrainfall)

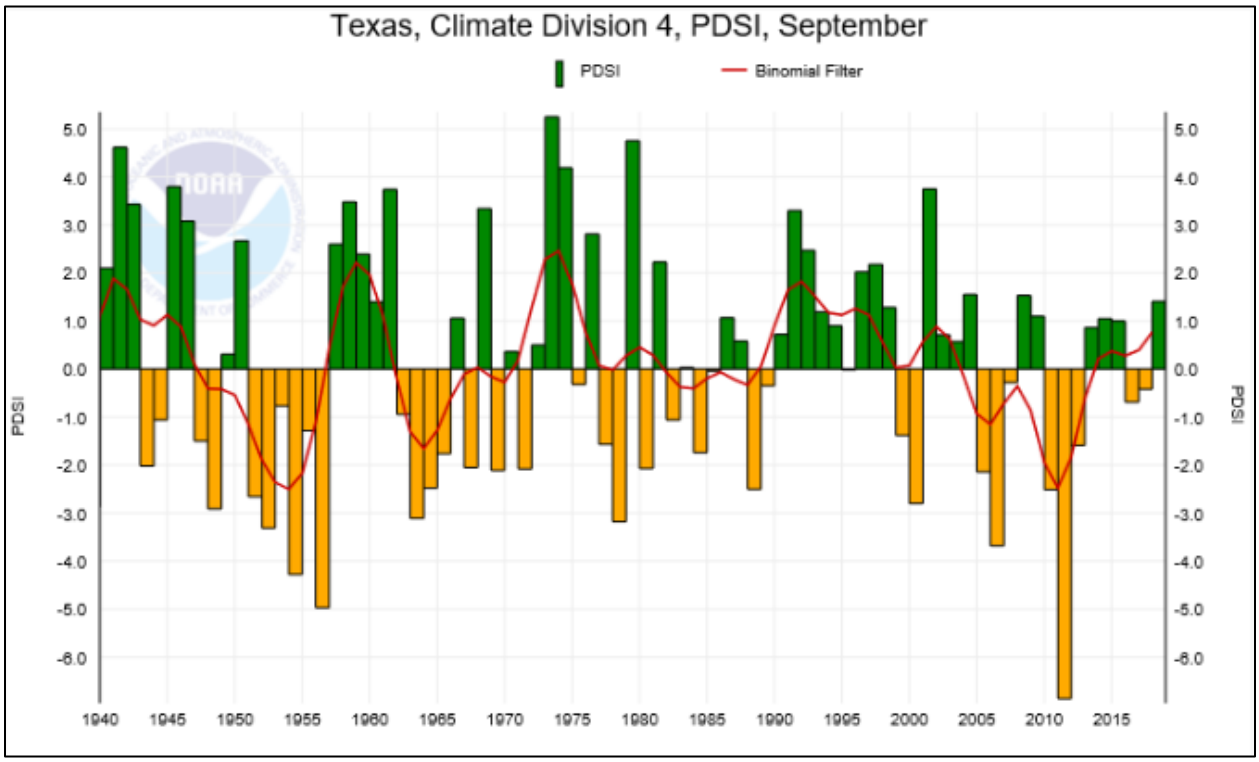

Figure 7.4 PDSI, 1940 – 2018

Source: (https://www.ncdc.noaa.gov/cag/divisional/timeseries)

7.1.3 North East Texas Region Drought of Record

For the purpose of this planning cycle, the drought of the 1950s is declared the DOR. This drought is the key drought period represented and utilized in the official Texas Commission on Environmental Quality (TCEQ) Water Availability Models (WAMs) for the river basins within the RWPA. While subsequent major droughts have occurred in the Region, none have yet displayed the combination of intensity and duration of the 1950's drought. Further, the official WAMs do not yet incorporate more recent hydrology observed since the year 2000, so it is yet unknown whether more recent drought conditions might be a new DOR for watersheds within the Region.

The catalyst for more recent droughts can be attributed primarily to rainfall deficit (meteorological drought). The hydrological drought (impact on surface waters and groundwater) is a result of both meteorological and socioeconomic drought. To reiterate, socioeconomic drought occurs when demand exceeds supply due to a weather-related deficit. Typically, demand for a product increases with population growth and per capita consumptions. Supply increases due to efficiency technology and the construction of new water projects. If both are increasing, the rate of change between supply and demand is the key. However, when demand exceeds supply, vulnerability is magnified by water shortages during drought.

In future planning cycles, it would be useful to attempt to quantify the extent that anthropological factors exacerbate drought severity. Suggested areas of investigation include: base flow studies, sub-watershed scale water balance calculations, and rainfall deficit quantification.

7.2 Current Drought Preparations and Response

As mandated by 31 TAC 357.42(a)&(b), this section of the RWP summarizes and assesses all preparations and drought contingency plans (DCPs) that have been adopted by municipalities and water providers within the North East Texas Region. The summary includes what specific triggers are used to determine the onset of each defined drought stage and the associated response actions that have been developed by local entities to decrease water demand during the drought stage.

Because of the range of conditions that affected the more than 4,000 water utilities throughout the State in 1997, the Texas Legislature directed the TCEQ to adopt rules establishing common drought plan requirements for water suppliers. As a result, TCEQ requires all wholesale public water providers, retail public water suppliers serving 3,300 connections or more, and irrigation districts to submit DCPs to the TCEQ. Wholesale water providers and retail public water suppliers serving less than 3,300 connections are also required to prepare and administer DCPs. Plans are required to be made available for inspection upon request, but do not need to be submitted to the TCEQ.

DCPs are intended to establish criteria to identify when water supplies may be threatened and the actions that should be taken to ensure these potential threats are minimized. The general structure of DCPs allows increasingly stringent drought response measures to be implemented in successive stages as water supply decreases and water demand increases. This measured, or gradual, approach allows for timely and appropriate action as a water shortage develops. The onset and termination of each implementation stage should be defined by specific "triggering" criteria. Triggering criteria are intended to ensure that: 1) timely action is taken in response to a developing situation, and 2) the response is appropriate to the level of severity of the situation. Each water-supply entity is responsible for establishing its own DCP that includes appropriate triggering criteria and responses.

At present, no specific drought response strategies amongst user groups in the Region have been identified as unnecessary or counterproductive by confusing the public or impeding drought response efforts.

DCPs typically emphasize measures of demand management designed to decrease water demand through curtailment of uses. Demand management in this context differs from water conservation, although the terms are frequently interchanged. The objective of water conservation is to achieve long-term reductions in water use through improved water use efficiency, reduced waste, and through reuse. Demand management focuses on temporary reductions in use in response to temporary shortages in water supply or other emergencies (e.g. equipment failures caused by peak water demands being excessive).

7.2.1 Drought Response Triggers

Drought response triggers should be specific to each water supplier and should be based on an assessment of the water user's vulnerability. In some cases, it may be more appropriate to establish triggers based on a supply source volumetric indicator such as a lake surface elevation. Similarly, triggers might be based on supply levels remaining in an elevated or ground storage tank within the water distribution system; this is not a recommended approach, as the warning of supply depletion would be only three to four days. Triggers based on demand levels can also be effective, if the demands are closely monitored. Whichever method is employed, trigger criteria should be defined on well-established relationships between the benchmark and historical experience. If historical observations have not been made, then common sense must prevail until such time that more specific data can be presented.

7.2.2 Surface Water Triggers

Surface water triggers are widely-used in the RWPA, typically in conjunction with other triggers based on system demands. Surface water triggers based on reservoir capacity and/ or stage (water pool elevation) are relatively easy to monitor remotely as several reservoirs in the RWPA are equipped with gages and satellite telemetry with real-time data posted online.

7.2.3 Groundwater Triggers

Groundwater triggers that indicate the onset of drought are not as easily identified as factors related to surface-water systems. This is attributable to: (1) the rapid response of stream discharge and reservoir storage to short-term changes in climatic conditions within a region and watersheds where surface drainage originates, and (2) the typically slower response of groundwater systems to recharge processes. Although climatic conditions over a period of one or two years might have a significant impact on the availability of surface water, aquifers within the same area might not respond as quickly, depending on the location and size of recharge areas in a basin, the distribution of precipitation over recharge areas, the amount of recharge, and the extent to which aquifers are developed and exploited by major users of groundwater. No entities utilize groundwater triggers in the RWPA.

7.2.4 System Capacity Triggers

Because of the above described problems with using water levels as drought-condition indicators, several municipal water-supply entities in the North East Texas Region that rely on groundwater generally establish drought-condition triggers based on levels of demand that exceed a percentage of the systems production capacity. All the entities listed in Table 7.1 use both supply triggers as well as demand triggers with one exception. The Red River Authority bases its' drought triggers on average daily use.

7.2.5 Municipal and Wholesale Water Provider Drought Contingency Plans

The TCEQ requires all retail public water suppliers serving 3,300 connections or more and wholesale public water providers to submit a drought contingency plan to TCEQ. The amended Title 30, TAC, Chapter 288 addresses TCEQ's guidelines and plan requirements. The forms for wholesale public water providers, retail public water suppliers and irrigation districts are available at: https://www.tceq.texas.gov/permitting/water_rights/wr_technicalresources/contingency.html

DCPs for municipal uses by public water suppliers must document coordination with the regional water planning groups to ensure consistency with the regional water plans. The following entities have prepared DCPs. Several of the entities have plans accessible at the specified websites:

- City of Commerce http://commercetx.org
- City of Cooper https://www.cityofcoopertx.municipalimpact.com/waterutilities
- City of Emory https://www.cityofemory.com/
- City of Greenville http://www.ci.greenville.tx.us
- City of Hughes Springs http://www.hughesspringstxusa.com/water.html
- City of Mount Pleasant https://www.mpcity.net/159/Water
- City of Paris http://www.paristexas.gov
- City of Sulphur Springs http://www.sulphurspringstx.org/departments/utilities.php
- Combined Consumers Water Utility http://www.ccsud.com
- Lamar County Water Supply District https://www.lamarcountywater-supply.com/
- North East Texas Municipal Water District http://www.netmwd.com/
- North Texas Municipal Water District https://ntmwd.com
- Red River Authority http://www.rra.texas.gov
- Texarkana Water Utilities http://twu.txkusa.org/

A list of entities, their supply source, specific triggers and actions (highlighted), for each drought stage is provided in Table 7.1.

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Table 7.1 Municipal Mandated Drought Triggers and Actions

Water Supply Entity	Drought Trigger	Drought Stage and Response				
		Mild	Moderate	Severe	Critical	Emergency
BICOUNTY WSC	• Capacity usage.	• Consumption > 80% daily max supply for 3 consecutive days; or • Supply reduced to 20% > consumption of previous month; or • >8 weeks of low rainfall; and • Daily use > 20% above same period of previous year.	• Consumption > 90% available for 3 consecutive days; or • Levels in any storage tanks cannot refill for 3 consecutive days.	• System failure; • Consumption > 95% available 3 days; • Consumption > 100% available; and storage levels drop during 24hour period; • Contamination; • Disaster declaration; • Wholesale supply reduction due to drought conditions; • Imminent health or safety risks to public.	N/A	N/A
		• Schedule restrictions • Reduce flushing operations • Reduce use via education.	• Prohibit outside use unless variance • Public outreach via local media	• Prohibit outside use • Usage restrictions • Enforcement and educational efforts	N/A	N/A
BIG SANDY	• Capacity usage.	• Shortage reaches 85% of capacity per day; or • Supply < 50% capacity.	• Shortage reaches 90% capacity per day; or • Supply < 40% capacity.	• Shortage reaches 95% capacity per day; or • Supply < 25% capacity.	N/A	• System failure; • Supply contamination.
		• Voluntary reduction 10%.	• Prohibit nonessential use except landscape use; • Reduce demand 15%.	• Prohibit nonessential use except landscape use; • Reduce demand 20%.	N/A	• Assess severity of problem; • Identify actions needed, time required to solve.
CENTRAL BOWIE COUNTY	• Daily supply and demand.	• Voluntarily conservation; • Prescribed restrictions on certain use.	• Comply with requirements/ restrictions on certain nonessential use.	• Comply with requirements/ restrictions on certain nonessential use.	• Comply with requirements/ restrictions on certain nonessential use.	• System failure; • Supply contamination.
		• Reduce demand by 10%.	• Reduce demand by 20%.	• Reduce demand by 35%.	• Reduce demand by 50%.	• Reduce demand by 60%.
CITY OF COMMERCE	• Multistage drop in water levels in water supply lakes.	• Levels < 432.5 ft. in Lake Tawakoni; or • PDSI reaches 2 to 3; or • Requested by SRA.	• Production reaches 3.1 MGD for 5 consecutive days; or • Storage not refilled for 3 consecutive days.	• Emergency pump activation; or • Shortages deemed severe by City Manager.	• Production reaches 3.5 MGD for 7 days; or • Storage not completely refilled for 5 days.	• Contamination; or • System failure; or • Unprecedented loss of capability to provide service.
		• Reduce demand 5%.	• Reduce demand 10% or reduce demand by 2.79 MGD.	• Reduce demand to 2.79 MGD.	• Reduce demand 10% or reduce demand to 3.15 MGD.	• Response determined based on conditions.
CITY OF COOPER	• Multistage drop in water levels in water supply lakes.	• Reservoir levels < 455 ft.; or • PDSI at "Moderate;" or • Reservoir recharged 2 times in 1 year; and • Demand is 75% capacity for 3 consecutive days.	• Reservoir levels < 454 ft.; or • PDSI at "Severe;" or • Reservoir recharged 1 time in the past 12 months; and • Demand is 85% capacity for 3 consecutive days.	• Reservoir levels < 453 ft.; or • PDSI at "Extreme;" or • Reservoir does not recharge in the past 12 months; and • Demand is 95% capacity for 3 consecutive days.	N/A	N/A
		• Voluntary usage reduction; • Reduce demand by 70%	• Prohibit unnecessary water use except for landscape use; • Reduce demand by 75%.	• Prohibit all unnecessary water use; • Reduce demand by 85%.	N/A	N/A

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Water Supply Entity	Drought Trigger	Drought Stage and Response				
		Mild	Moderate	Severe	Critical	Emergency
CITY OF DETROIT	• Daily supply and demand.	• 85% peak daily use for 7 days; or • 85% peak daily use in east line is 3.12 and west line is 1.44 MGD; 100% peak daily use for 3 days; or • 100% peak daily use in east line is 3.67 west line is 1.7 MGD; or • Treated reservoir levels fill < 90% overnight; or • “Mild" status implemented.	• 90% peak daily use for 14 days; or • 90% peak daily use in east line is 3.3 and west line is 1.53 MGD; 100% peak daily use for 6 days; or • 100% peak daily use in east line is 3.67 and west line is 1.7 MGD; Treated reservoir levels fill < 80% overnight; or • "Moderate" status implemented.	• 95% peak daily use for 21 days; or • 95% peak daily use in east line is 3.49 and west line is 1.61 MGD; • 100% peak daily use for 9 days; or • 100% peak daily use in east line is 3.67 and west line is 1.7 MGD; • Treated reservoir levels fill < 70% overnight; or • "Severe" status implemented.	• 97% peak daily use for 21 days; or • 97% peak daily use in east line is 3.56 and west line is 1.65 MGD; or • 100% peak daily use for 9 days; or • 100% peak daily use in east line is 3.67 and west line is 1.7 MGD; or • Treated reservoir levels fill < 50% overnight; or • "Critical" status implemented.	• System failure; or • Supply contamination; or • "Emergency status" implemented.
		• Reduce demand 10%.	• Reduce demand 10%.	• Reduce demand 15%.	• Reduce demand 20%.	• Reduce demand 25%.
CITY OF EMORY	• Multistage drop in water levels in water supply lakes.	• Lake Tawakoni volume<728.3K ac-ft.; • Demand > 1.45 MGD for 30 days; or • Demand > 1.7 MGD; • Demand >60% safe capacity 30 days or 75% safe capacity one day.	• Lake Tawakoni volume<705.4K ac-ft.; • Demand >1.7 MGD for 30 days; or • Demand > 1.93 MGD; or • Demand >70% safe capacity 30 days or 80% safe capacity 1 day.	• Lake Tawakoni volume<663.2k ac-ft, • Demand >1.93 MGD 30 days; or • Demand >2.17 MGD; • Demand > 80% safe capacity 30 days, or 85% safe capacity one day; or • Supply < 180 days.	• Lake Tawakoni volume < 632.4K acre-ft.; or • Demand > 2.17 million gallons for 30 days, or • Demand >2.42 MGD; or • Demand > 90% safe capacity for 30 days or 100% safe capacity one day; or • Supply < 120 days.	• System failure; or • System contamination; or • Supply will not last 90 days.
		• Usage reduction 10%.	• Prohibit unnecessary water use except for landscape use; Reduce demand 20%.	• Prohibit unnecessary water use; Limited landscape use at prescribed times. Reduce demand 40%.	• Prohibit unnecessary water use; Limit landscape use; Reduce demand 50%; Alternative pumping devices into Lake Tawakoni.	• Prohibit any and all unnecessary water use; • Reduce demand 70%.
		The City of Emory employs a water allocation stage when the city determines that the water supply in Lake Tawakoni will not last another 60 days. Water will be rationed on number of residence per household basis at a surcharged rate.				
CITY OF FROGNOT	• Capacity usage range; and • Replenishment percentage.	• Voluntarily conservation; Prescribed restrictions on certain uses; • Treated reservoir levels fill < 100% overnight; or • Well may be temporarily out of service; or • Pumping levels continue to decline.	• Restrictions on certain nonessential uses; if • Treated reservoir levels fill < 90% overnight; or Well may be temporarily out of service; or • Pumping levels continue to decline.	• Stage 3 restrictions on certain non-essential water uses; if • Treated reservoir levels fill < 85% overnight; or • Well may be temporarily out of service; or • Pumping levels continue to decline.	• Stage 4 restrictions on certain nonessential uses; if Treated reservoir levels fill < 75% overnight; or • Well may be temporarily out of service; or • Pumping levels continue to decline.	• System damage or failure; or • Supply contamination; or • One or more wells are out of service; or • One or more wells are experiencing significant pumping level declines.
		• Reduce demand 10%.	• Reduce demand 15%.	• Reduce demand 20%.	• Reduce demand 30%.	• Reduce demand 50%.

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Water Supply Entity	Drought Trigger	Drought Stage and Response				
		Mild	Moderate	Severe	Critical	Emergency
CITY OF GREENVILLE	• Reservoir levels; and • Lake Tawakoni levels; and • Palmer Drought Severity Index; and • Reservoir recharge frequency; and • Demand.	• Reservoir levels <532.5 ft.; and • Lake Tawakoni <434 ft and • PDSI at Moderate, and • Reservoir recharged 2 times in the past 12 months; and • Demand is 60% capacity.	• Reservoir levels <531.5 ft.; and • Lake Tawakoni <432 ft.; and • PDSI at Severe and • Reservoir recharged 1 time in the past 12 months; and • Demand is 70% capacity.	• Reservoir levels <531.5 ft.; and • Lake Tawakoni <431 ft.; and • PDSI at Extreme and • Reservoir recharged 0 times in the past 12 months; and • Demand is 80% capacity.	• Four of the triggering criteria in "Severe" Stage met; or • Critical water shortage declaration.	• All five of the triggering criteria in "Severe" Stage are met; or • System failure; or • Supply contamination.
		• Voluntary usage reduction and conservation.	• Reduce demand by 10%; • Restricted use.	• Reduce demand by 20% • Restricted use; • Nonessential use prohibited.	• Reduce demand by 30%; • Restricted use; • Nonessential use prohibited.	• Reduce demand by 40%; • Prohibit all watering; Rationing implemented.
CITY OF GLADEWATER	• Multistage drop in water levels in water supply lakes.	• Mild shortage exists when Lake Gladewater is 4 ft. above lowest intake pipe.	• Moderate shortage exists when Lake Gladewater is 3 ft. above lowest intake pipe.	• Stage 3 nonessential use compliance when the level of Lake Gladewater is 2 ft. above lowest intake pipe.	N/A	• Stage 4 nonessential use compliance when the level of Lake Gladewater is 1 ft. above lowest intake pipe.
		• Reduce demand 5%.	• Reduce demand 10%.	• Reduce demand 15%.	N/A	• Reduce demand 20%.
CITY OF HOOKS	• Capacity usage range; and • Replenishment percentage.	• Consumption > 90% production capacity; or • 90% consumption for 3 days; and Weather conditions considered in drought classification determination.	• Consumption >100% prod. capacity 3 days; Mild drought will exist > 5 days; or • Storage tank taken out of service during mild drought; or • Storage capacity not maintained during period of 100% prod. Existence of preceding conditions listed for 36 hours.	• Consumption > 110% capacity for 24 hrs or • Consumption prevents storage maintained; or • Demand > available pump capacity; or • Two conditions listed during moderate drought occurs in 24 hours; or • Contamination; or • Severe condition or system damage/failure.	N/A	• System failure; or • Supply contamination.
		• Reduce demand 10%.	• Reduce demand 20%.	• Reduce demand 30%.	N/A	• Assess severity; Identify actions and time required to solve.
CITY OF HUGHES SPRINGS	• Capacity usage.	• Shortage reaches 85% of capacity per day; or • Supply < 50% capacity.	• Shortage reaches 90% capacity per day; or • Supply < 40% capacity.	• Shortage reaches 95% capacity per day; or • Supply < 25% capacity.	N/A	• System failure; Supply contamination.
		• Voluntary usage reduction of 10%.	• Prohibit nonessential use except for landscape use; Reduce demand by 15%.	• Prohibit nonessential use except for landscape use; Reduce demand by 20%.	N/A	• Assess the severity of the problem; Identify the actions needed and time required to solve.
CITY OF KILGORE	• Capacity usage.	• Available supply < 70% storage capacity; or • Stage 1 drought initiation notification; or • Specific capacity is < 70% of original specific capacity; or • Other triggering criteria deemed by city.	• Available supply < 60% storage capacity; or • Stage 2 drought initiation notification; or • Specific capacity is < 60% of original specific capacity; or • Other triggering criteria deemed by city.	• Available supply < 50% storage capacity; or • Stage 3 drought initiation notification; or • Specific capacity is < 50% of original specific capacity; or • Other triggering criteria deemed by city.	• Available supply < 40% storage capacity; or • Stage 4 drought initiation notification; or • Specific capacity is < 40% of original specific capacity; or • Other triggering criteria deemed by city.	• System failure; Supply contamination.
		• Voluntary 5% reduction.	• Voluntary 10% reduction.	• Voluntary 15% reduction.	• Voluntary 20% reduction.	• Voluntary 30% reduction.

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Water Supply Entity	Drought Trigger	Drought Stage and Response				
		Mild	Moderate	Severe	Critical	Emergency
CITY OF LONGVIEW	• Capacity usage.	• 90% of 48.8 MGD pumping capacity for 4 consecutive days.	• 93% of 49.4 MGD pumping capacity for 3 consecutive days.	• 95% of 49.4 MGD pumping capacity for 3 consecutive days.	N/A	• System failure; Supply contamination.
		10% usage reduction.	15% usage reduction.	25% usage reduction.	N/A	25% usage reduction.
CITY OF MOUNT PLEASANT	• Based on a percentage of capacity usage rate.	• Daily demand > 85% for 3 consecutive days; or • Levels in Lake Bob Sandlin decline at a rate disruptive to supply.	• Daily demand > 90% for 3 consecutive days; or • Levels in Lake Bob Sandlin decline at a rate causing imminent disruption to supply.	• Daily demand > 90% for 3 consecutive days; or • Pump failure; or • Storage levels no longer achieve full recovery in low demand periods.	• Daily demand > 100% for 1 day; or • Demand > safe limits; • Storage levels cannot maintain fire protection; • Lake Bob Sandlin levels decline to potential pumping failure.	• System failure; or • Supply contamination; or • Storage levels and pressures prevent fire protection.
		• Voluntary usage reduction of 10%; • Nonessential use prohibited.	• Prohibit nonessential use; • Landscape use limited to prescribed times; Reduce demand by 15%.	• Prohibit nonessential use; • Landscape use limited to prescribed times; • Reduce demand by 25%.	• Prohibit nonessential use; • Landscape use limited to prescribed times; • Reduce demand by 30%.	• All use prohibited except for public health and safety; • Reduce demand by 75%; • Implement any available alternative supply sources.
CITY OF PARIS	• Based on a percentage of capacity usage rate.	• Supply < 70% in Pat Mayse Lake and Lake Crook combined; or • Period of high demand; or • Production or distribution limits exist.	• Supply < 60% in Pat Mayse Lake and Lake Crook combined; or • Daily demand > 32 million gallons for 7 days; or • Daily demand > 36 million gallons for 3 days; or • Production or distribution limits exist.	• Supply < 50% in Pat Mayse Lake and Lake Crook combined; or • Daily demand > 34 million gallons for 14 days; or • Daily demand > 36 million gallons for 6 days; or • Production or distribution limits exist.	N/A	• Supply < 40% in Pat Mayse Lake and Lake Crook combined; or • Daily demand > 35 million gallons for 21 days; or • Daily demand > 36 million gallons for 9 days; or • Production or distribution limits exist; or • System failure; or • Supply contamination.
		• Voluntary usage reduction of 10%; • Limited nonessential use.	• Prohibit nonessential use; • Landscape use limited to prescribed times; • Reduce demand by 20%.	• Prohibit nonessential use; • Landscape use limited to prescribed times; • Reduce demand by 30%.	N/A	• Prohibit nonessential use; • Landscape use prohibited; • Reduce demand by 40%; • Prorata curtailment to wholesale customers.
CITY OF SULFUR SPRINGS		• Daily demand > 90%; or • Lake level decline disruptive to supply; or • Supply low enough to cause concern.	• Daily demand > 100%; or • Lake level decline causes serious disruption; or • Storage capacity not maintained.	• Daily demand > 110%; or • Lake levels too low for production equipment; or • Storage capacity prevents fire protection; or • Pumping capacity unable to refill; or • Failure could cause immediate health and safety hazard; or • Supply contamination.	N/A	N/A
CITY OF SULFUR SPRINGS	• Percent capacity usage; Lake capacity; Potential disruption of supply.	• Usage reduction of 10%; • Limited nonessential use.	• Prohibit nonessential use; • Landscape use limited to prescribed times; • Reduce demand by 15%.	• Prohibit nonessential use; • Landscape use limited to prescribed times; • Reduce demand by 20%.	N/A	N/A

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Water Supply Entity	Drought Trigger	Drought Stage and Response				
		Mild	Moderate	Severe	Critical	Emergency
COMBINED CONSUMERS WATER UTILITY	• Percentage of capacity usage; • Lake capacity; • Replenishment percentage.	• Lake Tawakoni < 432 ft.; or • Demand reaches 80% of daily supply for 3 days; or • System not replenished to 80% capacity in 3 days.	• Lake Tawakoni < 430 ft.; • Demand reaches 90% of daily supply for 2 days; or • System not replenished to 90% capacity in 2 days.	• Lake Tawakoni < 428 ft.; or • Demand 100% of daily supply for 1 day; or • Contamination; or • Disaster declaration; • Health or safety concerns; or • System failure.	• Lake Tawakoni < 426 ft.; then • Emergency booster pump installation.	• All previous triggering criteria; or • System failure; or • Supply contamination; then • Deeper water source required.
		• Voluntary usage reduction of 5%; • Voluntary landscape use reduction; • Conservation request.	• Prohibit nonessential use; • Landscape use limited to prescribed times; Reduce demand 15%.	• Prohibit nonessential use; • Landscape use limited to prescribed times; • Reduce demand 20%.	• Prohibit nonessential use; • Landscape use limited to prescribed times; • Reduce demand 30%.	• Prohibit nonessential use; • Landscape use prohibited; • Reduce demand 40%.
		Combined Consumers Water Utility employs a water allocation stage when the utility determines falling treated water levels do not refill above 50% overnight for any of the stages listed above. Water use is allocated on a surface per household basis.				
CITY OF WHITE OAK	• Capacity usage.	• Demand > 85% safe capacity; or • Demand > 2.8 MGD for 3 days; or • Big Sandy Creek levels decline at disruptive supply rate.	• Demand > 90% safe capacity; or • Demand > 2.97 MGD for 3 days; or • Demand causes storage levels to fall daily and recover during low demand periods; or • Big Sandy Creek levels decline rate makes supply problems imminent.	• Demand > 90% safe system capacity; or • Demand > 2.97 MGD for 7 days; or • Pump failure; or • Storage levels no longer achieve recovery in low demand periods; or • Big Sandy Creek levels lower than highest intake tower.	• Demand > 100% safe capacity; or • Demand > 3.3 MGD for 1 day; or • Demand > safe system limits; or • Storage reservoir levels cannot maintain fire protection; or • Big Sandy Creek decline to levels that may cause system failure.	• System failure; or • Supply contamination; or • System cannot maintain fire protection.
CITY OF WHITE OAK		• Voluntary 5% usage reduction.	• Voluntary 10% usage reduction.	• Voluntary 15% usage reduction.	• Voluntary 20% usage reduction.	• Voluntary 25% usage reduction.
HARLETON WSC	• Capacity usage.	• Consumption is 80% of supply for 3 consecutive days; or • Supply is 20% > previous month's consumption; or • >4 weeks of low rainfall and use > 15% more than same period of previous year.	• Consumption is 80% of supply for 3 consecutive days; or • Levels in any storage tanks cannot be refilled for 3 consecutive days.	• Consumption > 95% of supply for 3 consecutive days; or • Disaster declaration; or • Wholesale supply reduction due to drought conditions.	• Consumption > 100% of supply; and • Storage levels drop during one 24hour period.	• System failure; • Supply contamination.
		• Voluntary usage reduction of 5%.	• 10% demand reduction.	• 15% demand reduction.	• 20% demand reduction.	• 30% demand reduction.
LAMAR COUNTY WATER SUPPLY DISTRICT	• Capacity usage rate; • Replenishment percentage.	• Demand reached 85% of peak daily use for 7 days; or • System reaches 100% of peak daily use for 3 days; or • Reservoir levels < 90%.	• Demand reached 90% of peak daily use for 14 days; or • System reaches 100% of peak daily use for 6 days; or • Reservoir levels < 80%.	• Demand reached 95% of peak daily use for 21 days; or • System reaches 100% of peak daily use for 9 days; or • Reservoir levels < 70%.	• Demand reached 97% of peak daily use for 21 days; or • System reaches 100% of peak daily use for 9 days; or • Reservoir levels < 50%.	• System failure; or • Supply contamination.
		• Voluntary usage reduction of 10%; • Voluntary landscape use reduction; • Nonessential water use prohibited.	• Reduce demand by 10%; • Nonessential water use prohibited; • Landscape use limited to prescribed times.	• Reduce demand by 15%; • Nonessential water use prohibited; • Landscape use limited to prescribed times.	• Reduce demand by 20%; • Nonessential water use prohibited; • Landscape use prohibited.	• Reduce demand by 25%; • Nonessential water use prohibited; • Landscape use prohibited.
		Lamar County Water Supply District employs a water allocation stage when emergency conditions are in place.				

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Water Supply Entity	Drought Trigger	Drought Stage and Response				
		Mild	Moderate	Severe	Critical	Emergency
LAKE FORK WSC	• Capacity usage.	• Consumption is 80% of supply for 3 consecutive days; or • Supply is 20% > previous month's consumption; or • > 8 weeks of low rainfall; and Usage > 20% same period of previous year.	• Consumption > 90% available for 3 consecutive days; or • Levels in any storage tanks cannot refill for 3 consecutive days.	• System failure; or • Consumption > 95% supply for 3 days; or • Consumption of 100% available; and • Storage levels drop during 24hour period; Contamination; or • Disaster declaration; Wholesale supply reduction from drought; or • Events of public health or safety risks.	N/A	N/A
		• Schedule restrictions; • Reduce flushing operations. Reduce use via education.	• Prohibit outside use unless variance; Public outreach via local media.	• Prohibit outside use. • Usage restrictions. • Enforcement and educational efforts.	N/A	N/A
		Prorata water allocation triggered when severe water shortage conditions have been met.				
NORTH EAST TEXAS MUNICIPAL WATER DISTRICT	• Capacity usage rate; • Replenishment percentage.	• 48 hours of 85% pumping capacity utilized in a 24hour period; or • Supply volume < 50% capacity.	• 48 hours of 90% pumping capacity utilized in a 24hour period; or • Supply volume < 40% capacity.	• 48 hours of 95% pumping capacity utilized in a 24hour period; or • Supply volume < 25% capacity.	N/A	• System failure; or • Supply contamination.
		• Voluntary usage reduction of 10%; or • Voluntary landscape use reduction.	• Reduce demand by 15%; • Nonessential use prohibited.	• Reduce demand by 20%; • Nonessential use prohibited; • Prorate curtailment for wholesale customers.	N/A	• Assess the severity of the problem; • Identify the actions needed and time required to solve.
		Prorata water allocation triggered when severe water shortage conditions have been met.				
NORTH TEXAS MUNICIPAL WATER DISTRICT	• Multistage drop in water levels in water supply lakes.	• Demand projected as limit; or • Lavon Lake or Jim Chapman Lake < 65% full; or • Sabine River Authority (SRA) indicates "Mild Drought" in Upper Basin supplies; or • Demand > 90% delivered amount for 3 consecutive days; or • Demand approaches delivery capacity; or • Supply contamination; or • System damage.		• Demand projected as limit; or • Lavon Lake or Jim Chapman Lake < 55% full; or • SRA indicates "Mild Drought" in Upper Basin water supplies; or • Demand > 95% of amount delivered for 3 consecutive days; or • Demand approaches delivery capacity; or • Contamination; or • System damage.	• Demand projected above limit; or • Lavon Lake or Jim Chapman Lake < 45% full; or • SRA indicates "Moderate Drought" in Upper Basin water supplies; or • Demand > 98% of amount delivered for 3 consecutive days; or • Demand > delivery capacity; or • Supply contaminated; or • System damage.	• Demand projected as supply limit; or • Lavon Lake or Jim Chapman Lake < 35% full; or • SRA indicates "Severe Drought" in Upper Basin water supply; or • Demand > delivery capacity; or • Supply contamination; or • System damage.
		• Voluntary usage reduction; • Increase public education of water reduction.		• Reduce production 5%; • Further accelerate public education; • Halt nonessential use; • Notify TCEQ.	• Reduce production by 10%; • Initiate use restrictions; • Limit landscape water to once weekly; • Notify TCEQ	• Reduce production; • Impose mandatory restrictions on cities and customers; • Notify TCEQ.

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Water Supply Entity	Drought Trigger	Drought Stage and Response				
		Mild	Moderate	Severe	Critical	Emergency
RED RIVER AUTHORITY	• Daily average use; and • Demand percentage.	• System > 2.5 times daily average for 14 days; and • Wholesale demand vol. reduced by 20%; or • Reduce demand 20%.	• System > 3.5 times daily average for 7 days; and • Wholesale demand vol. reduced by 20% to 50%; and • Demand reduced between 20% & 50%.	• System > 5.5 times daily average 3 days; and • Wholesale demand vol. reduced over 50%; and • Reduce demand > 50%.	N/A	N/A
		• Reduce demand by 20%.	• Reduce demand by 20%; • Prohibit landscape and nonessential use.	• Reduce demand to maintain public health and safety; • Prohibit landscape and nonessential use.	N/A	N/A
RIVERBEND	• Capacity usage range; and Replenishment percentage.	• 72 consecutive hours of 85% pumping capacity; or • Supply volume < 50% capacity.	• 72 consecutive hours of 90% pumping capacity; or • Supply volume < 40% capacity.	• 72 consecutive hours of 95% pumping capacity; or • Supply volume < 25% capacity.	N/A	• System failure; or • Supply contamination.
		• Reduce demand by 10%.	• Reduce demand by 20%.	• Reduce demand by 30%.	N/A	• Assess the severity of the problem; • Identify the actions needed and time required to solve.
SABINE RIVER AUTHORITY IRON BRIDGE AND LAKE FORK DIVISIONS	• Capacity use percentage.	• Lake Tawakoni and Lake Fork capacity < 65% for 2 consecutive months.	• Lake Tawakoni and Lake Fork capacity < 55% for 2 consecutive months.	• Lake Tawakoni and Lake Fork capacity < 45% for 2 consecutive months.	• Lake Tawakoni and Lake Fork capacity < 30% for 2 consecutive months.	• Lake Tawakoni and Lake Fork capacity < 30% for 6 consecutive months.
		• Reduce contract diversion from temporary and short-term contracts; • Notify customers.	• Reduce contract diversion from temporary and short-term contracts; • Reduce diversion to long-term contracts; • Notify customers.	• Reduce contract diversion from temporary and short-term contracts; • Reduce diversion to long-term contracts; • Notify public; • Possible emergency meetings.	• Reduce contract diversion, temporary and short-term contracts; • Reduce diversion to long-term contracts; • Municipal customers to prohibit all outdoor use and limit indoor use; Notify public; • Possible emergency meetings.	• Ration contract diversion amounts; • All nonessential outdoor use prohibited; • Indoor use minimized; • Notify public; • Possible emergency meetings.
		In the event of a major contamination of Lake Tawakoni and Lake Fork; or a failure or breakdown of a major component of the pumps or delivery system, SRA will notify its customers and the media, and prohibit all nonessential water use.				
SABINE RIVER AUTHORITY TOLEDO BEND AND GULF COAST DIVISIONS	• Capacity use percentage.	• Surface elevation in Toledo Bend < 165.1 ft. for 14 consecutive days; or • Sabine River flow < "mild" condition trigger.	• Surface elevation in Toledo Bend < 162.2 ft. for 14 consecutive days; or • Sabine River flow < "moderate" condition trigger.	• Surface elevation in Toledo Bend < 156 ft. for 14 consecutive days; or • Sabine River flow < "severe" condition trigger.	N/A	N/A
SABINE RIVER AUTHORITY TOLEDO BEND AND GULF COAST DIVISIONS		• Inform customers of drought condition; and • Activate system to answer inquiries.	• Inform customers of drought condition; Possible water curtailing; Potentially prohibit nonessential outdoor use.	• Inform public of drought condition; Possible emergency meeting; May curtail water delivery; Potentially prohibit all outdoor use and reduce indoor use.	N/A	N/A
		In the event of a major contamination or drawdown of Toledo Bend for emergency repairs; or a failure or breakdown of a major component of the pumps or delivery system, SRA will notify its customers and the media, and prohibit all nonessential water use.				

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Water Supply Entity	Drought Trigger	Drought Stage and Response				
		Mild	Moderate	Severe	Critical	Emergency
SAND FLAT WSC	• Capacity usage.	• Consumption is 80% of supply for 3 consecutive days; or • Supply is 20% > previous month's consumption; or • > 8 weeks of low rainfall; and Usage > 20% same period of previous year.	• Consumption > 90% available for 3 consecutive days; or • Levels in any storage tanks cannot refill for 3 consecutive days.	• System failure; or • Consumption > 95% available supply for 3 consecutive days; or • Consumption of 100% available; and Storage levels drop during one 24hour period; or • Supply contamination; or • Disaster declaration; or • Wholesale supply reduction due to drought conditions; or • Events which may cause imminent public health or safety risks.	N/A	N/A
		• Schedule restrictions; • Reduce flushing operations. • Reduce use via education.	• Prohibit outside use unless granted variance; • Public outreach via local media.	• Prohibit outside use. • Usage restrictions. • Enforcement and educational efforts.	N/A	N/A
TEXARKANA WATER UTILITIES	• Reservoir conditions; • Demand.	• Wright Patman Reservoir is 220.60 ft.; or • Pump is out of service; or • Demand > 18 MGD.	• Wright Patman Reservoir is 220.60 ft.; and/or; • Supply pump is out of service; and/or; • Demand > 18 MGD.	• Wright Patman Reservoir is 220.60 ft.; and • Supply pumps is out of service; and • Demand > 18 MGD.	N/A	• Unable to produce or provide treated water from both plants simultaneously.
		• Encourage conservation.	• Reduce demand by 30%; • Limit nonessential and landscape use.	• Reduce nonessential demand by 40%; Reduce total demand by 30%; Prohibit outdoor use; Curtail wholesale use.	N/A	• Reduce demand to 8.65 MGD; • Restricted to sanitary use only; • Curtailing wholesale use.
WEST CASS	• Capacity usage.	• Consumption is 80% of supply for 3 consecutive days; or • Supply is 20% > previous month's consumption; or • > 8 weeks of low rainfall; and Usage > 20% same period of previous year.	• Consumption > 90% available for 3 consecutive days; or • Levels in any storage tanks cannot refill for 3 consecutive days.	• System failure; or • Consumption > 95% available supply for 3 consecutive days; or • Consumption of 100% available; and • Storage levels drop during one 24hour period; or • Supply contamination; or • Disaster declaration; or • Wholesale supply reduction due to drought conditions; or • Events which may cause imminent public health or safety risks.	N/A	N/A
		• Schedule restrictions; • Reduce flushing operations. • Reduce use via education.	• Prohibit outside use unless granted variance; • Public outreach via local media.	• Prohibit outside use. Usage restrictions. Enforcement and educational efforts.	N/A	N/A

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Water Supply Entity	Drought Trigger	Drought Stage and Response				
		Mild	Moderate	Severe	Critical	Emergency
WEST GREGG SUD	• Capacity usage.	• Demand > 60% total well capacity for 3 consecutive days; or • Demand causes line pressure below safe levels; or • Other triggering criteria deemed by operator.	• Demand > 70% total well capacity for 3 consecutive days; or • Demand causes line pressure below safe levels; or • Other triggering criteria deemed by operator.	• Demand > 80% total well capacity for 3 consecutive days; or • Demand causes line pressure below safe levels; or • Other triggering criteria deemed by operator.	• Demand > 90% total well capacity for 3 consecutive days; or • Demand causes line pressure below safe levels; or • Other triggering criteria deemed by operator.	• System failure; • Supply contamination.
		• Voluntary usage reduction of 5%.	• 10% demand reduction.	• 15% demand reduction.	• 20% demand reduction.	• 30% demand reduction.

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7.3 Existing and Potential Emergency Interconnects

According to Texas Statute §357.42(d), (e), regional water planning groups are to collect information on existing major water infrastructure facilities that may be used in the event of an emergency shortage of water. Pertinent information includes identifying the potential user(s) of the interconnect, the potential supplier(s), the estimated potential volume of supply that could be provided, and a general description of the facility. Texas Water Code §16.053(c) requires information regarding facility locations to remain confidential. This section provides general information regarding existing and potential emergency interconnects among water user groups within the North East Texas Region.

7.3.1 Existing Emergency Interconnects

Water infrastructure facilities within the North East Texas Region were identified through a survey process in order to better evaluate existing and potentially feasible emergency interconnects. The survey included major water infrastructure facilities like the City of Longview and the City of Marshall, along with smaller systems such as Karnack WSC. Of those surveyed, 50 water supply systems have the ability to receive an emergency supply of water through an existing emergency interconnect. Table 7.2 presents the survey results for the existing emergency interconnects among water users and neighboring systems.

Table 7.2 Existing Emergency Interconnects to Major Water Facilities in the North East Texas Region

Entity *Providing* Supply	Entity *Receiving* Supply
Lamer County Water	410 WSC
Texarkana Water Utilities	Atlanta
City of Reyes City and Cash SUB, BHP WSC	BHP WSC
City of Marshall	Blocker Crossroads WSC
City of Farmersville and City of Greenville	Caddo Basin SUD
Karnack WSC	Caddo Lake WSC
NETMWD	City of Avinger
Caddo Basin Special Utility District	City of Caddo Mills
Texarkana Water Utilities	City of Domino
AlbaGolden	City of Grand Saline
Texarkana and Riverbend	City of Hooks
City of Gladewater	City of Warren City
City of Longview	City of White Oak, Gum Springs WSC #2
Lake Fork WSC	City of Yantis
Cash SUD	Combined Consumer SUD, West Tawakoni
City of Kilgore	Cross Roads SUD
City of Marshall	Cypress Valley WSC Plant 1
City of Marshall	Cypress Valley WSC Plant 2
NETMWD	Daingerfield
NETMWD	Diana SUD
Glenwood WSC	East Mountain Water System

Entity *Providing* Supply	Entity *Receiving* Supply
City of Longview	Elderville WSC
City of Longview	Forest Lake Subdivision
City Of Marshall	Gill WSC
East Mountain	Glenwood WSC
City of Longview	Gum Springs WSC
City of Longview	Hallsville
NETMWD	Harleton WSC
Gill WSC	Holiday Springs Mobile Home Park
Hughes Springs	Holly Springs WSC
NETMWD	Hughes Springs
NETMWD	Jefferson
City of Yantis	Lake Fork WSC
City Of Marshall	Leigh WSC
City of Kilgore	Liberty Danville FWSD 2
NETMWD	Lone Star
NETMWD	Mims WSC
BiCounty WSC	Newsome WSC
NETMWD	Pittsburg
Texarkana Water Utilities	Queen City
City of Winnsboro	Sharon WSC
City of Marshall	Talley WSC
BiCounty WSC	Thunderbird Point Water System
City of Mt. Pleasant	Tri SUD
City of Longview	Tryon Road SUD
Gum Springs WSC #1	West Harrison WSC
City of Longview	White Oak
BiCounty WSC	Woodland Harbor

7.3.2 Potential Emergency Interconnects

Responses to survey questions helped identify other potential emergency interconnects for various WUGs within the North East Texas Region. Table 7.3 presents a list of 163 WUGs potentially receiving and the WUGs supplying the potential emergency interconnects.

Table 7.3 Potential Emergency Interconnects to Major Water Facilities in the North East Texas Region

Entity *Providing* Supply	Entity *Receiving* Supply
Red River County WSC	410 WSC
McBee SUD	Ables Springs WSC
City of Van, R P M WSC, Edom WSC	Ben Wheeler WSC
Caddo Basin SUD, Cash SUD	BHP WSC
TRI SUD, Diana SUD, Sharon WSC, Cypress Springs SUD, Holly Springs WSC, Mims WSC, NETMWD	Bi-County WSC
Pritchett WSC	Big Sandy
Sharon WSC	Big Wood Springs Water System
City of Atlanta	Bloomburg WSC
410 WSC	Blossom
Red River County WSC	Bogata
Shirley WSC, Miller Grove WSC, City of Sulphur Springs, Gafford Chapel WSC	Brashear WSC
South Rains SUD, Golden WSC, Shirley WSC, Miller Grove WSC	Bright StarSalem SUD
North Hopkins WSC, Cypress Springs SUD, Martin Springs WSC, Franklin County WD	Brinker WSC
BiCounty WSC	Brookshires Camp Joy Water System
City of Texarkana, Texas Riverbend WRD	Burns Redbank WSC
City of Greenville, BHP WSC, Frognot WSC, Hickory Creek SUD, North Hunt SUD	Caddo Basin SUD
Karnack WSC	Caddo Lake WSC
Caddo Basin SUD, BHP WSC, Cash SUD	Caddo Mills
Shady Grove WSC	Campbell WSC
Myrtle Springs WSC, MacBee SUD, Fruitvale WSC	Canton
City of Greenville , Shady Grove WSC, Miller Grove WSC, South Rains SUD, Combined Consumers SUD, BHP WSC	Cash SUD
Hickory Creek SUD	Celeste
City of Texarkana, Texas Riverbend WRD Red River County WSC, City of New Boston	Central Bowie County WSC
BiCounty WSC	Cherokee Point Water Company
Fouke WSC	City of Big Sandy

Entity *Providing* Supply	Entity *Receiving* Supply
Western Cass WSC	City Of Douglassville
South Tawakoni	City of Edgewood
Western Cass WSC	City Of Marietta
City of Emory	City of Point
Jones WSC, Fouke WSC	City of Quitman
Cypress Springs SUD	City of Winnsboro
City of Texarkana, Texas Riverbend WRD, Red River County WSC	Clarksville
City of White Oak	Clarksville City
City of Quitman	Clear Lakes
City of Quinlan, City of West Tawakoni, Ables Springs WSC, MacBee SUD, South Tawakoni WSC	Combined Consumers SUD
North Hunt SUD, Gafford Chapel WSC	Commerce
Delta County MUD	Cooper
Cypress Springs SUD, City of Winnsboro, Sharon WSC	Cornersville WSC
Pritchett WSC	Country Club Estates
City of Texarkana, Texas Riverbend WRD, Red River County WSC, Western Cass WSC	County-Other, Bowie
Delta County MUD, Lamar County WSD, North Hunt SUD, NTMWD, Sabine River Authority	County-Other, Delta
North Hopkins WSC, Brinker WSC, City of Sulphur Springs, Gafford Chapel WSC, Cypress Springs SUD, NTMWD, Sabine River Authority	County-Other, Hopkins
Cash SUD, City of Greenville, NTMWD, Hickory Creek SUD, North Hunt SUD, City of Commerce, Sabine River Authority	County-Other, Hunt
Lamar County WSD, City of Paris, 410 WSC	County-Other, Lamar
Cash SUD, Miller Grove WSC, Shirley WSC, Bright Star Salem SUD, South Rains SUD, City of Emory, City of East Tawakoni, NTMWD, Sabine River Authority	County-Other, Rains
Red River County WSC, Lamar County WSD, City of Texarkana, Texas Riverbend WRD	County-Other, Red River
TRI SUD, City of Mount Pleasant, Bi County WSC	County-Other, Titus

Entity *Providing* Supply	Entity *Receiving* Supply
MacBee SUD, South Tawakoni WSC, Fruitvale WSC, Myrtle Springs WSC, City of Canton, Little Hope Moore WSC, Bethel Ash WSC, Ben Wheeler WSC, RPM WSC, City of Van, Carroll WSC, Pruitt Sandflat WSC	County-Other, Van Zandt
Mims WSC	Crestwood Water Company
Myrtle Springs WSC	Crooked Creek WSC
Lindale Rural WSC	Crystal Systems Texas
Cash SUD, Miller Grove WSC, Gafford Chapel WSC, Brashear WSC	Cumby
Franklin County WD, Brinker WSC, North Hopkins WSC, Tri SUD, Bi County WSC, Sharon WSC, Mt Vernon	Cypress Springs SUD
City of Texarkana, Texas Riverbend WRD	De Kalb
City of Cooper, Lamar County WSD, North Hunt SUD, City of Ladonia, North Hopkins WSC, NTMWD, Sabine River Authority	Delta County MUD
Northeast Texas MWD	Diana SUD
Cash SUD, South Rains SUD	East Tawakoni
City of Atlanta	Eastern Cass WSC
South Tawakoni WSC, MacBee SUD	Edgewood
Ben Wheeler WSC, RPM WSC, Leagueville WSC, City of Brownsboro	Edom WSC
Blocker Crossroads	Elysian Fields WSC
City of Jefferson	EMC WSC
South Rains SUD, Bright Star Salem SUD, Miller Grove WSC	Emory
Lindale Rural WSC	Enchanted Lakes Water System
City of Quitman	Fouke WSC
Pritchett WSC	Friendship Water System
South Tawakoni WSC, Golden WSC, South Rains SUD, Bright Star Salem SUD	Fruitvale WSC
City of Cumby, Brashear WSC, City of Sulphur Springs, North Hunt SUD, City of Commerce, North Hopkins WSC	Gafford Chapel WSC
City of Longview	Garden Acres Subdivision
Pritchett WSC	Gilmer
City of Grand Saline, Fruitvale WSC, Bright Star Salem SUD, Ramey WSC, Sabine River Authority	Golden WSC

Entity *Providing* Supply	Entity *Receiving* Supply
Fruitvale WSC, Golden WSC, Pruitt Sandflat WSC	Grand Saline
Shady Grove WSC, Cash SUD, North Hunt SUD, Caddo Basin SUD, Hickory Creek SUD	Greenville
BiCounty WSC	HAB WSC
Pritchett WSC	Harmony ISD
Fouke WSC	Hawkins
City of Celeste, Caddo Basin SUD, Frognot WSC, West Leonard WSC, City of Leonard, Arledge Ridge WSC, City of Wolfe City, North Hunt SUD, NTMWD, Sabine River Authority	Hickory Creek SUD
Mims WSC	Holiday Harbor
Jones WSC	Holiday Villages Of Fork
City of Texarkana, Texas Riverbend WRD	Hooks
Mims WSC	Indian Hills Harbor
West Gregg SUD	Jackson WSC
City of Hawkins	Jarvis Christian College
City of Longview	Johnson Mobile Home Park
Martin Springs WSC, Sharon WSC, Fouke WSC, City of Quitman, Sabine River Authority, NTMWD	Jones WSC
Leigh WSC	Karnack WSC
City of Jefferson	Kellyville Berea WSC
City of Paris, 410 WSC, Red River County WSC, Delta County MUD	Lamar County WSD
City of Kilgore	Liberty City WSC
Lindale Rural WSC	Lindale
City of Tyler	Lindale Rural WSC
NETMWD	Linden
City of Canton, Ben Wheeler WSC	Little Hope Moore WSC
Myrtle Springs WSC, City of Mabank, City of Wills Point, City of Edgewood, South Tawakoni WSC, Combined Consumers SUD, NTMWD, Sabine River Authority	Macbee SUD
City of Texarkana, Texas Riverbend WRD	Macedonia Eylau MUD 1
NETMWD	Marshall
City of Sulphur Springs, Shady Grove No. 2 WSC, Brinker WSC, Jones WSC, Lake Fork WSC	Martin Springs WSC
City of Texarkana, Texas Riverbend WRD	Maud

Entity *Providing* Supply	Entity *Receiving* Supply
Shirley WSC, Cash SUD, City of Cumby, Brashear WSC	Miller Grove WSC
Ramey WSC	Mineola
Tri SUD, NETMWD, Cypress Springs SUD, Bi County WSC	Mount Pleasant
Cypress Springs SUD	Mount Vernon
MacBee SUD, City of Canton, Fruitvale WSC	Myrtle Springs WSC
Tri SUD	Naples
City of Texarkana, Texas Riverbend WRD	Nash
City of Texarkana, Texas Riverbend WRD	New Boston
City of Mineola	New Hope SUD
City of Marshall	North Harrison WSC
North Hunt SUD, Gafford Chapel WSC, City of Sulphur Springs, Brinker WSC, Cypress Springs SUD, Delta County MUD	North Hopkins WSC
City of Wolfe City, Hickory Creek SUD, City of Ladonia, City of Commerce, Gafford Chapel WSC	North Hunt SUD
Elysian Fields WSC	Old Town WSC
Tri SUD	Omaha
NETMWD	Ore City
Lamar County WSD, 410 WSC, Red River County WSC	Paris
Mims WSC	Pine Harbor Subdivision
Carroll WSC, Pruitt Sandflat WSC, Golden WSC, Lindale Rural WSC	Pine Ridge WSC
Cash SUD, Ables Springs WSC, City of Terrell, High Point WSC, RCH WSC, Blackland WSC, NTMWD, Sabine River Authority	Poetry WSC
City of East Tawakoni, Cash SUD, South Rains SUD, South Tawakoni WSC, NTMWD, Sabine River Authority	Point
City of Gilmer	Pritchett WSC
City of Van, Carroll WSC, Pine Ridge WSC, Golden WSC, City of Grand Saline, Fruitvale WSC	Pruitt Sandflat WSC
Combined Consumers SUD, City of West Tawakoni, Cash SUD, NTMWD, Sabine River Authority	Quinlan
Fouke WSC	Quitman
City of Mineola	Ramey WSC

Entity *Providing* Supply	Entity *Receiving* Supply
410 WSC, City of Paris, City of Texarkana, Texas Riverbend WRD Central Bowie County WSC, Lamar County WSD	Red River County WSC
City of Texarkana, Texas Riverbend WRD	Redwater
City of Paris, 410 WSC, Red River County WSC	Reno (Lamar)
City of Texarkana, Arkansas	Riverbend Water Resources District
Pritchett WSC	Rosewood Water System
City of Chandler, Southern Utilities, Ben Wheeler WSC, Edom WSC	RPM WSC
Lindale Rural WSC	Sand Flat WSC
City of Marshall	Scottsville
Leigh WSC	Shadowood Water Co
Brashear WSC, City of Sulphur Springs, Martin Springs WSC	Shady Grove NO. 2 WSC
City of Greenville, Cash SUD	Shady Grove WSC
Diana SUD	Shady Shores Water System
City of Winnsboro	Sharon WSC
Bright Star Salem SUD, Miller Grove WSC, Brashear WSC, Martin Springs WSC, Lake Fork WSC, NTMWD, Sabine River Authority	Shirley WSC
City of Tyler	Smith County MUD 1
City of Point, City of Emory, Bright Star Salem SUD, Fruitvale WSC, South Tawakoni WSC, NTMWD, Sabine River Authority	South Rains SUD
City of Wills Point	South Tawakoni
Combined Consumers SUD, MacBee SUD, South Rains SUD, Fruitvale SUD, City of Edgewood, City of Wills Point, NTMWD, Sabine River Authority	South Tawakoni WSC
City of Winona	Star Mountain WSC
City of Gladewater	Starrville-Friendship WSC
Shady Grove No. 2 WSC, Brashear WSC, Gafford Chapel WSC, North Hopkins WSC, Brinker WSC, Martin Springs WSC	Sulphur Springs
City of Texarkana, Arkansas	Texarkana
North Hunt SUD, Gafford Chapel WSC	Texas A&M University Commerce
Caddo Lake WSC	TPWD Caddo Lake State Park
Sand Flat WSC	TPWD Tyler State Park
City of Mount Pleasant, Cypress Springs SUD, Bi County WSC, Western Cass WSC	TRI SUD

Entity *Providing* Supply	Entity *Receiving* Supply
City of Gladewater	Union Grove WSC
Ben Wheeler WSC, Pruitt Sandflat WSC, Carroll WSC	Van
City of Texarkana, Texas Riverbend WRD	Wake Village
Waskom Rural WSC	Waskom
City of Waskom	Waskom Rural WSC
City of Kilgore	West Gregg SUD
Gum Springs WSC	West Harrison WSC
Combined Consumers SUD, City of Quinlan, NTMWD, Sabine River Authority	West Tawakoni
City of Linden	Western Cass WSC
MacBee SUD, South Tawakoni WSC, NTMWD, Sabine River Authority	Wills Point
Cypress Springs SUD	Winnsboro
Star Mountain WSC	Winona
Arledge Ridge WSC, North Hunt SUD, Hickory Creek SUD	Wolfe City
BiCounty WSC	Woodland Harbor

7.4 Emergency Responses to Local Drought Conditions or Loss of Municipal Supply

Texas Statute §357.42(g) requires regional water planning groups to evaluate potential temporary emergency water supplies for all County-Other WUGs and municipalities with 2020 populations less than 7,500 that rely on a sole source of water. The purpose of this evaluation is to identify potential alternative water sources that may be considered for temporary emergency use in the event that the existing water supply sources become temporarily unavailable due to extreme hydrologic conditions such as emergency water right curtailment, unanticipated loss of reservoir conservation storage, or other localized drought impacts. This section provides potential solutions that should act as a guide for municipal water users that are most vulnerable in the event of a loss of supply. This review was limited and did not require technical analyses or evaluations following in accordance with 31 TAC §357.34.

7.4.1 Emergency Responses to Local Drought Conditions

A survey was conducted to identify and evaluate the municipal water users that are most vulnerable in the event of an emergency water shortage. The analysis included all 'county-other' WUGs and rural cities with a population less than 7,500 and on a sole source of water. Table 7.4 presents temporary responses that may or may not require permanent infrastructure. It was assumed in the analysis that the entities listed would have approximately 180 days or less of remaining water supply. Additionally, entities with existing infrastructure but no contract language that specifically addresses emergency supply have been included in this table.

Table 7.4 Emergency Responses to Local Drought Conditions in the North East Texas Region

Entity				Implementation Requirements									
County	Water User/ Group Name	TCEQ Service Connection (Count)	2020 Demand (AF/year)	Release from upstream reservoir	Curtailment of upstream or downstream water	Local groundwater wells	Brackish groundwater limited treatment	Brackish groundwater desalination	Potential Emergency interconnect	Trucked in water	Type of infrastructure required	Entity providing supply	Emergency agreements already in place
BOWIE	Burns Redbank WSC	718	201	▪	▪	▪			▪	▪			
BOWIE	Central Bowie County WSC	2,765	619	▪	▪	▪			▪	▪			
BOWIE	De Kalb	953	295	▪	▪	▪			▪	▪			
BOWIE	Hooks	1,936	281	▪	▪	▪			▪	▪			
BOWIE	Macedonia Eylau MUD 1	2,791	588	▪	▪	▪			▪	▪			
BOWIE	Maud	735	211	▪	▪	▪			▪	▪			
BOWIE	Nash	660	392	▪	▪	▪			▪	▪			
BOWIE	Wake Village	2,133	699	▪	▪	▪				▪			
CAMP	Pittsburg	1,858	832	▪	▪	▪	▪		▪	▪		BiCounty WSC	
CASS	Atlanta	2,486	1,017	▪	▪	▪			▪	▪		Texarkana	
CASS	Linden	1,001	301			▪			▪	▪			
CASS	MIMS WSC	850	128	▪	▪	▪			▪	▪		NETMWD	
CASS	Hughes Springs	1,917	279	▪	▪	▪			▪	▪		NETMWD	
DELTA	Cooper		446		▪				▪	▪			
FRANKLIN	Mount Vernon	1,279	564			▪			▪	▪		Cypress Springs SUD	

Entity				Implementation Requirements									
County	Water User/ Group Name	TCEQ Service Connection (Count)	2020 Demand (AF/year)	Release from upstream reservoir	Curtailment of upstream or downstream water	Local groundwater wells	Brackish groundwater limited treatment	Brackish groundwater desalination	Potential Emergency interconnect	Trucked in water	Type of infrastructure required	Entity providing supply	Emergency agreements already in place
FRANKLIN	Cypress Springs SUD	5,151	630		▪	▪			▪	▪	piping & meters	Mt. Vernon	
GREGG	Clarksville City	386	100			▪			▪	▪		White Oak	
GREGG	Gladewater	3111	731		▪	▪	▪		▪		well & equip.	Warren City	▪
GREGG	White Oak	2,548	1,347		▪	▪	▪		▪			Longview	▪
GREGG	Liberty City WSC	1,767	487			▪			▪	▪		Kilgore	
GREGG	Tryon Road SUD	3,220	717	▪	▪	▪	▪		▪	▪		Longview	
HARRISON	Blocker Crossroads WSC	534	133			▪			▪	▪		Marshall	
HARRISON	Leigh WSC	1,339	411			▪			▪	▪		Marshall	
HARRISON	Scottsville	480	247	▪	▪	▪			▪	▪		Marshall	
HARRISON	Waskom	1,150	435			▪			▪	▪		Waskom Rural WSC	
HARRISON	Hallsville	1,515	545		▪	▪			▪	▪		Longview	
HARRISON	Gum Springs WSC 1	958	207		▪	▪			▪	▪			
HARRISON	Gum Springs WSC 2	2,368	563		▪	▪			▪			Longview	▪
HOPKINS	Brashear WSC	404	148	▪	▪				▪	▪			
HOPKINS	Cornersville WSC	363	90			▪			▪	▪		Cypress Springs SUD	

Entity				Implementation Requirements									
County	Water User/ Group Name	TCEQ Service Connection (Count)	2020 Demand (AF/year)	Release from upstream reservoir	Curtailment of upstream or downstream water	Local groundwater wells	Brackish groundwater limited treatment	Brackish groundwater desalination	Potential Emergency interconnect	Trucked in water	Type of infrastructure required	Entity providing supply	Emergency agreements already in place
HOPKINS	Cumby	397	133			▪			▪	▪			
HOPKINS	Jones WSC	1,884	407			▪			▪	▪		Quitman	
HOPKINS	North Hopkins WSC	2,401	474		▪	▪	▪		▪	▪	well & equip.		
HUNT	Delta County MUD	1,051	130		▪	▪			▪	▪			
HUNT	Celeste	334	124			▪			▪	▪			
HUNT	Shady Grove SUD	232	139	▪	▪				▪	▪			
HUNT	Texas A&M University Commerce	904	156		▪	▪			▪	▪			
HUNT	West Tawakoni	1,506	276		▪				▪			Cash SUD	▪
HUNT	Combined Consumers SUD	2,854			▪				▪			Cash SUD	▪
LAMAR	Blossom	640	136		▪	▪			▪	▪			
LAMAR	Reno (Lamar)	1,280	548		▪	▪			▪	▪			
MARRION	KellyvilleBerea WSC	372	107			▪			▪			Jefferson	▪
MORRIS	Daingerfield	1,085	465	▪	▪	▪			▪	▪		NETMWD	
MORRIS	Holly Springs WSC	437	58	▪	▪	▪			▪	▪		Hughes Springs	
MORRIS	Lone Star	782	189	▪	▪	▪			▪	▪		NETMWD	

Entity				Implementation Requirements									
County	Water User/ Group Name	TCEQ Service Connection (Count)	2020 Demand (AF/year)	Release from upstream reservoir	Curtailment of upstream or downstream water	Local groundwater wells	Brackish groundwater limited treatment	Brackish groundwater desalination	Potential Emergency interconnect	Trucked in water	Type of infrastructure required	Entity providing supply	Emergency agreements already in place
RAINS	Miller Grove WSC	656	29			▪			▪				▪
RAINS	Golden WSC	1,395	4			▪			▪	▪		Ramey WSC	
RAINS	Point	967	364		▪				▪	▪	well & equip.	Emory	
RED RIVER	410 WSC	802	224		▪				▪	▪			
RED RIVER	Bogata	651	123			▪			▪	▪			
RED RIVER	Clarksville	1,516	620			▪			▪	▪		White Oak	
SMITH	Sand Flat WSC	1,155	243			▪			▪	▪		Lindale Rural WSC	
SMITH	Winona	284	133			▪			▪	▪		Star Mountain WSC	
SMITH	Lindale	2,613	1,317			▪			▪	▪		Lindale Rural WSC	
SMITH	Crystal Systems	2,050	1,356			▪			▪	▪		Lindale Rural WSC	
SMITH	Lindale Rural WSC	4,207	830			▪			▪	▪		Lindale	▪
UPSHUR	Fouke WSC	2,443	10			▪			▪	▪		Quitman	
UPSHUR	Gladewater	3,111	444		▪	▪	▪		▪		well & equip.	Warren City	▪
UPSHUR	Glenwood WSC	1,087	287			▪			▪	▪		East Mountain	

Entity				Implementation Requirements									
County	Water User/ Group Name	TCEQ Service Connection (Count)	2020 Demand (AF/year)	Release from upstream reservoir	Curtailment of upstream or downstream water	Local groundwater wells	Brackish groundwater limited treatment	Brackish groundwater desalination	Potential Emergency interconnect	Trucked in water	Type of infrastructure required	Entity providing supply	Emergency agreements already in place
UPSHUR	Big Sandy	767	224			▪	▪		▪	▪	piping & meters	Pritchett WSC	
UPSHUR	Diana SUD	2,222	422	▪	▪	▪			▪	▪	piping	Northeast Texas MUD	
WOOD	Hawkins	685	362			▪			▪	▪		Fouke WSC	
WOOD	Lake Fork WSC	1,509	218			▪			▪	▪		Yantis	
WOOD	Mineola	2,688	847			▪			▪	▪		Ramey WSC	
WOOD	New Hope SUD	848	329			▪			▪	▪		Mineola	
WOOD	Ramey WSC	1,505	278			▪			▪	▪		Mineola	
WOOD	Bright StarSalem Sud	1,957	151			▪			▪	▪			
WOOD	Quitman	1,252	316		▪	▪			▪	▪	well & equip.	Jones WSC; Fouke WSC	
WOOD	Winnsboro	1,775	548		▪	▪	▪		▪	▪	well & equip.	Cypress Springs SUD	
WOOD	Sharon WSC	2,769	307			▪	▪		▪	▪	piping & valves	Winnsboro	▪
VAN ZANDT	Ben Wheeler WSC	898	214			▪			▪	▪			
VAN ZANDT	Edom WSC	486	130			▪			▪	▪			

Entity				Implementation Requirements									
County	Water User/ Group Name	TCEQ Service Connection (Count)	2020 Demand (AF/year)	Release from upstream reservoir	Curtailment of upstream or downstream water	Local groundwater wells	Brackish groundwater limited treatment	Brackish groundwater desalination	Potential Emergency interconnect	Trucked in water	Type of infrastructure required	Entity providing supply	Emergency agreements already in place
VAN ZANDT	Fruitvale WSC	1,183	305			▪			▪	▪			
VAN ZANDT	Grand Saline	1,346	387			▪			▪	▪			
VAN ZANDT	Little Hope Moore WSC	502	147			▪			▪	▪			
VAN ZANDT	Myrtle Springs WSC	528	118			▪			▪	▪			
VAN ZANDT	Pine Ridge WSC	556	6			▪			▪	▪			
VAN ZANDT	Pruitt Sandflat WSC	485	156			▪			▪	▪			
VAN ZANDT	South Tawakoni WSC	1,439	438		▪				▪	▪		Wills Point	
COUNTY OTHER													
GREGG	Warren City	132			▪	▪	▪		▪	▪	existing infrastructure	Gladewater	▪
HARRISON	Caddo Mills	492		▪		▪				▪		Karnack WSC	▪
HARRISON	Talley WSC	551		▪	▪	▪			▪	▪	piping & valves	Marshall	▪

Entity				Implementation Requirements									
County	Water User/ Group Name	TCEQ Service Connection (Count)	2020 Demand (AF/year)	Release from upstream reservoir	Curtailment of upstream or downstream water	Local groundwater wells	Brackish groundwater limited treatment	Brackish groundwater desalination	Potential Emergency interconnect	Trucked in water	Type of infrastructure required	Entity providing supply	Emergency agreements already in place
HARRISON	North Harrison WSC	505		▪	▪	▪			▪	▪	piping, meters & valves	Leign WSC	
HARRISON	West Harrison WSC	716		▪	▪	▪			▪	▪		Gum Springs WSC #1	▪
HUNT	Campbell WSC	503	49			▪	▪		▪	▪	1 mile of pipeline	Shady Grove WSC	
SMITH	East Texas MUD	858			▪	▪	▪		▪	▪	well & equip.		
SMITH	Star Mountain WSC	588			▪	▪	▪		▪	▪	well & equip.		
VAN ZANDT	Crooked Creek WSC	322			▪	▪			▪	▪	piping, meters & valves	Myrtle Springs WSC	
WOOD	South Rains WSC	1,050		▪	▪	▪			▪	▪		Bright StarSalem WSC	
WOOD	Yantis Water	263			▪	▪			▪	▪		Fork Lake/Reservoir	

7.4.2 Releases from Upstream Reservoirs and Curtailment of Rights

In times of drought and limited supply, the most 'junior' right holder must be the first to discontinue use, under Texas' "prior appropriations system". This temporary source of supply was evaluated as a feasible option during an emergency shortage of water. Of the 90 entities listed on Table 7.4, 49 municipalities might have the option of implementing curtailment of water rights. In addition, release from upstream reservoirs was also evaluated. Table 7.4 presents 25 entities where this approach might be feasible.

7.4.3 Brackish Groundwater

Brackish groundwater was evaluated as a temporary source during an emergency water shortage. Some brackish groundwater is found in certain places in the Carrizo-Wilcox Aquifer, but other brackish groundwater supplies can be obtained from the Nacatoch and Queen City aquifers in the North East Texas Region.

Required infrastructure would include additional groundwater wells, potential treatment facilities and conveyance facilities. Brackish groundwater at lower TDS concentrations may require only limited treatment. Of the entities listed in Table 7.4, ten will be able to potentially use brackish groundwater as a feasible solution to an emergency local drought condition.

7.4.4 Drill Additional Local Groundwater Wells and Trucking in Water

If the existing water supply sources become temporarily unavailable, drilling additional groundwater wells and trucking in water are optimal solutions. Table 7.4 presents this option as viable for most of the entities listed.

7.4.5 TCEQ Emergency Funds for Groundwater Supply Wells

In order to qualify for emergency funds that are earmarked for emergency groundwater supply wells, entities must have a drought plan in place and be currently listed as an entity that is limiting water use to avoid shortages. This list is updated weekly by the TCEQ's Drinking Water Technical Review and Oversight Team and can be found at: https://www.tceq.texas.gov/drinkingwater/trot/exception

Thirty-four entities within the RWPA were identified by the TCEQ as Drought Affected Public Water Systems (PWS) list as of July 2019. The list is presented in Appendix C7-1.

There is some assistance available through the Texas Department of Agriculture (TDA) and the TWDB. There are requirements, deadlines, and a specific application process. Contact the TWDB by email, <Financial_Assistance@twdb.texas.gov>, or call 5124637853. Contact the TDA, Community Development Block Grants, or call 5129367891. Funding is limited.

7.4.6 Other TCEQ Guidance Resources

- Emergency and Temporary Use of Wells for Public Water Supplies (RG485) https://www.tceq.texas.gov/assets/public/comm_exec/pubs/rg/rg485.pdf
- Questions from the TCEQ's Workshops on Drought Emergency Planning: Answers to Help DrinkingWater Systems Prepare for Emergencies https://www.tceq.texas.gov/assets/public/response/drought/workshopquestions071312.pdf

- Video: Workshop on Drought Emergency Planning for PWSs in Texas http://www.youtube.com/watch?v=BdlF9CEcGPI&feature=plcp&context=C34378a7UDOEgsToPDskJNYWXf5I3pKq8tW9pkVqQU

7.5 Region-Specific Drought Response Recommendations and Model Drought Contingency Plans

7.5.1 Drought Response Recommendations

As mandated by TAC 357.42(c)&(j), the RWPGs shall develop drought response recommendations regarding the management of existing groundwater and surface water sources in the RWPA designated in accordance with §357.32. The RWPGs shall make drought preparation and response recommendations regarding the development of, content contained within, and implementation of local DCPs. The RWPGs shall develop region-specific model DCPs that shall be presented in the RWP which shall be consistent with 30 TAC Chapter 288 requirements.

Regional Drought Planning expands the conceptualization and application of drought planning by specific entities to encompass the entire RWPA. The approach utilized in developing a region-specific drought plan considers the following:

1. all regional groundwater and surface water sources;
2. current drought plans that are being utilized by user entities within the region; and
3. current groundwater monitoring wells within the region that have evolved since the previous planning cycle.

The goals of this approach are:

1. to gain a comprehensive view of what resources are being monitored by entities within the region;
2. determine which resources are not being monitored;
3. determine which users do not fall under the umbrella of existing DCPs,
4. identify potential groundwater monitoring stations with publicly accessible real-time data that currently exist;
5. determine how these data can be utilized for the water user groups that are not subject to existing DCPs; and
6. development of a regional model drought contingency plan.

As discussed in Section 7.4, several WUGs and various public supply systems have written drought management plans or DCPs and have provided them for inclusion in the Regional Plan. Drought triggers based on groundwater elevations are not utilized in Region D. Additionally, there is only one real-time monitoring well on TWDB's Water Data for Texas website. State well number 3430907 monitors the confined portion of the Carrizo-Wilcox Aquifer. It is located about four miles north of Tyler State Park in northern Smith County. As a result, it is recommended that the NETRWPG use the U.S. Drought Monitor (USDM) to help assess drought stages for all groundwater users, since there are no Groundwater Conservation Districts within the RWPA. A summary of drought severity classification used by the USDM is shown in Table 7.5.

Drought triggers for surface water are usually related to reservoir levels. A summary of reservoir triggers and actions are included in Table 7.1 and Table 7.6.

Table 7.5 USDM Drought Severity Classification

Category	Description	Possible Impacts	Palmer Drought Index	USGS Weekly streamflow (Percentiles)
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered	1.0 to 1.9	21 to 30
D1	Moderate Drought	Some damage to crops, pastures; Streams, reservoirs, or wells low, some water shortages developing or imminent; Voluntary wateruse restrictions requested	2.0 to 2.9	1120
D2	Severe Drought	Crop or pasture losses likely; Water shortages common; Water restrictions imposed	3.0 to 3.9	610
D3	Extreme Drought	Major crop/pasture losses; Widespread water shortages or restrictions	4.0 to 4.9	35
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; Shortages of water in reservoirs, streams, and wells creating water emergencies	5.0 or less	02

Source: https://droughtmonitor.unl.edu/AboutUSDM/AbouttheData/DroughtClassification.aspx

7.5.2 Region-Specific Model Drought Contingency Plan

The Regional Model DCP summary table (Table 7.6) provides an overview of all regional water sources and recommended drought triggers and actions.

Region-Specific Model DCPs for Wholesale Water Providers and for groundwater users are included in Appendix C7-2. Per the recommendation of the Drought Preparedness Council submitted to the NETRWPG on August 1, 2019, Region-Specific Model DCPs for those water use categories in the region that account for more than 10 percent of water demands in any decade over the 50year planning horizon are included in Appendix C7-3 for municipal, manufacturing, and steam-electric power generation use categories. The Regional Model DCPs will likely change over time in order to address the needs and issues of the Region's users.

A focus of the model plan considers the consistency of existing plans within the Region. Entities that have adopted drought plans will only be assessed to this end; therefore, fine tuning existing triggers of existing municipal drought plans is not a goal of the model plan, beyond an effort toward achieving consistent responses/actions to drought across the Region.

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Table 7.6 Recommended Regional Drought Plan Triggers and Actions

Source Name	Type (SW/GW)	Factor considered	TRIGGERS						ACTIONS					
			Source Manager			Users			Source Manager			Users		
			Mild	Severe	Critical/ Emergency	Mild	Severe	Critical/ Emergency	Mild	Severe	Critical/ Emergency	Mild	Severe	Critical/ Emergency
FORK	SW	Supply capacity	65% combined storage	45% combined storage	duration <30% combined storage	varies by user; see Table 7.1	varies by user; see Table 7.1	varies by user; see Table 7.1	Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies	
TAWAKONI	SW								Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies	
CYPRESS SPRINGS	SW	Supply capacity, demand	demand % of capacity; lake water level declines at disruptive rate				unknown		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies	
BOB SANDLIN	SW													
JIM CHAPMAN	SW	Supply capacity, demand	lake less than 50% capacity; >48 hours x% pumping capacity		loss of capacity, line breaks	voluntary	halt nonessential use	mandatory restrictions	Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies	
MONTICELLO	SW	unknown	unknown				unknown		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies	
LAKE O' THE PINES	SW	unknown	unknown				unknown		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies	
CADDO	SW	unknown	unknown				unknown		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies	
CROOK	SW	Supply capacity	70% combined storage	50% combined storage	40% combined storage	70% combined storage	50% combined storage	40% combined storage	Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies	
PAT MAYSE	SW													
SULPHUR SPRINGS	SW	unknown	unknown				unknown		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies	
WRIGHT PATMAN	SW	unknown	unknown				unknown		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies	
CYPRESS RIVER	SW	Drought Monitor	D1 (Moderate)	D2 (Severe)	D4 (Critical)	D1 (Moderate)	D2 (Severe)	D4 (Critical)	Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies	
SABINE RIVER	SSW	Drought Monitor	D1 (Moderate)	D2 (Severe)	D4 (Critical)	D1 (Moderate)	D2 (Severe)	D4 (Critical)	Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies	
SULPHUR RIVER	SW	Drought Monitor	D1 (Moderate)	D2 (Severe)	D4 (Critical)	D1 (Moderate)	D2 (Severe)	D4 (Critical)	Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies	

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Source Name	Type (SW/GW)	Factor considered	TRIGGERS						ACTIONS					
			Source Manager			Users			Source Manager			Users		
			Mild	Severe	Critical/ Emergency	Mild	Severe	Critical/ Emergency	Mild	Severe	Critical/ Emergency	Mild	Severe	Critical/ Emergency
BLOSSON AQUIFER	GW	Drought Monitor	D1 (Moderate)	D2 (Severe)	D4 (Critical)	D1 (Moderate)	D2 (Severe)	D4 (Critical)	Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies	
CARRIZO-WILCOX AQUIFER	GW	Drought Monitor	D1 (Moderate)	D2 (Severe)	D4 (Critical)	D1 (Moderate)	D2 (Severe)	D4 (Critical)	Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies	
NACATOCH AQUIFER	GW	Drought Monitor	D1 (Moderate)	D2 (Severe)	D4 (Critical)	D1 (Moderate)	D2 (Severe)	D4 (Critical)	Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies	
QUEEN CITY AQUIFER	GW	Drought Monitor	D1 (Moderate)	D2 (Severe)	D4 (Critical)	D1 (Moderate)	D2 (Severe)	D4 (Critical)	Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies	
TRINITY AQUIFER	GW	Drought Monitor	D1 (Moderate)	D2 (Severe)	D4 (Critical)	D1 (Moderate)	D2 (Severe)	D4 (Critical)	Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies	
WOODBINE AQUIFER	GW	Drought Monitor	D1 (Moderate)	D2 (Severe)	D4 (Critical)	D1 (Moderate)	D2 (Severe)	D4 (Critical)	Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies	
OTHER AQUIFER	GW	Drought Monitor	D1 (Moderate)	D2 (Severe)	D4 (Critical)	D1 (Moderate)	D2 (Severe)	D4 (Critical)	Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies		Invoke needed actions from DCP	Invoke needed actions from DCP, evaluate other/emergency supplies	

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7.5.3 WUG Specific Model Drought Contingency Plans

7.5.3.1 Public Water Supplier

Drought contingency plans have previously been adopted by most public suppliers and municipalities in the North East Texas Region, although some suppliers did not provide any adopted plans. Current triggers and response actions for participating entities are summarized in Table 7.1. Recommended changes to existing response actions are detailed in Table 7.6.

7.5.3.2 Irrigation

Irrigation wells located within a municipality are subject to the triggers and response actions designated by the city's drought plan. Nonexempt irrigation wells located outside of a municipality are not regulated as there are no GCDs within the RWPA.

7.5.3.3 Wholesale Water Provider

Wholesale water providers in the North East Texas Region are listed in Table 7.7. Their Drought Contingency Plan, if submitted, is summarized in Table 7.1. Generally, triggers are based upon reservoir capacities falling below a designated elevation or capacity, and when user demand exceeds a designated percent capacity of the supply system.

Table 7.7 Major/Wholesale Water Providers within the North East Texas Region

Name	Entity Type	Wholesale Customers
CASH SUD	WUG/WWP	BHP WSC, City of Greenville, City of Quinlan, City of Lone Oak, Country Wood Estates, Miller Grove WSC, Oak Ridge Estates, Quinlan North Subdivision, Rock Wall East Mini Ranch, Quinlan South Subdivision
CHEROKEE WATER COMPANY	WWP	City of Longview, Southwestern Electric Power Company (SWEPCO)
CITY OF COMMERCE	WWP	Gafford Chapel WSC, Maloy WSC, Manufacturing Hunt County Sulphur Basin North Hunt WSC, West Delta WSC, Texas A&M University
CITY OF EMORY	WUG/WWP	City of Point, City of East Tawakoni, City of South Rains WSC
FRANKLIN COUNTY WD	WWP	Cypress Springs SUD, City of Winnsboro, City of Mt. Vernon, City of Mt. Pleasant
CITY OF GREENVILLE	WUG/WWP	City of Caddo Mills, Jacobia WSC, Shady Grove WSC, Manufacturing, Mining, Cash SUD, Caddo basin SUD
LAMAR COUNTY WSD	WUG/WWP	410 WSC, City of Blossom, City of Deport, City of Detroit, Manufacturing, Pattonville WSC, Red River County WSC, City of Reno, City of Roxton, City of Toco, M J C WSC, Pretty WSC,
CITY OF LONGVIEW	WUG/WWP	Elderville WSC, Gum Springs WSC 1, City of Hallsville, City of White Oak, City of (raw water), Eastman Chemical Company Texas Operation, Forest Lake Subdivision, Gum Springs WSC 2
CITY OF MARSHALL	WUG/WWP	Cypress Valley WSC, Gill WSC, Leigh WSC, Talley WSC, Blocker Crossroads, City of Scottsville
CITY OF MOUNT PLEASANT	WUG/WWP	Tri Water SUD, Lake Bob Sandlin State Park, Manufacturing, City of Winfield

Name	Entity Type	Wholesale Customers
NORTHEAST TEXAS MWD	WWP	City of Avinger, City of Daingerfield, Diana SUD, City of Hughes Springs, City of Jefferson, City of Lone Star, City of Lone Star Steel Longview, City of Luminant Marshall, Mims WSC, City of Pittsburg , City of SWEPCO Tyron Road SUD
CITY OF PARIS	WUG/WWP	Lamar County WSD, Manufacturing, MJC WSC, Steam Electric
SULPHUR RIVER MWD	WWP	City of Commerce, City of Sulphur Springs, City of Cooper
CITY OF SULPHUR SPRINGS	WUG/WWP	Brashear WSC, Brinker WSC, Gafford Chapel WSC, Marting Springs WSC, Livestock, North HopkinWSC, Pleasant Hill WSC, Shady Grove WSC #2, Manufacturing
RIVERBEND WATER RESOURCES DISTRICT / TEXARKANA WATER UTILITIES	WUG/WWP	City of Annona, City of Atlanta, City of Avery, City of Central Bowie WSC, City of DeKalb, City of Domino, City of Hooks, Macedonia Eylau MUD, Manufacturing Cass County, Federal Correctional Institution, Manufacturing Bowie County, City of Maud, City of Nash, City of New Boston, City of Oak Grove WSC, City of Queen City, Red River Water Corp., CIty of Redwater, City of Wake Village, Texarkana Estates, Lone Star Army Ammunition Plant, City of Leary, El Chaparral Mobile Home Park,
TITUS COUNTY FWD #1	WWP	City of Mt. Pleasant, Luminant
SABINE RIVER AUTHORITY	WWP	Ables Springs WSC, Cash SUD, Combined Consumers SUD, City of Commerce, Eastman Chemicals, City of Edgewood, City of Emory, City of Greenville, City of Henderson, City of Bright StarSalem, CIty of Kilgore, City of Longivew, Mac Bee SUD, City of Point, City of Quitman, Release from TXU, South Tawakoni WSC, West Tawakoni, City of Wills Point

7.6 Drought Management Water Management Strategies

31 TAC 357.42(f) states that RWPGs may designate recommended and alternative drought management water management strategies and other recommended drought measures in the RWP. The list of recommended drought strategies and alternative drought strategies must include the associated WUG/ WWP and the triggers that would initiate the strategy. Potentially feasible drought strategies that were considered but not recommended must also be listed, as well as any other recommended measures included the RWP, including any applicable triggers.

The TWDB has required the consideration of a general methodology for estimating economic impacts associated with implementation of drought management as a water management strategy. Water user groups may have some flexibility to focus on discretionary outdoor water use first to reduce water use. Commercial and manufacturing use sectors may find some degrees of drought management to be economically viable and cost-competitive with other water management strategies.

The NETRWPG does not support the provision of drought management measures as an explicit WMS in the 2021 Region D Plan. Drought management measures vary within the Region, and are temporary strategies intended to conserve supply and reduce impacts during drought and emergency times, and are not implemented in the Region to address long-term demands. Little to no firm supply (i.e., yield) is gained from the implementation of these measures, given their application during such specific times, particularly when considered alongside more typical WMS in the planning process. Also, the use of such

measures, and their efficacy, varies greatly between entities within the North East Texas Region, creating additional uncertainty. Although not included as a specific WMS herein, drought management is nevertheless an important component of water supply management. The NETRWPG supports implementation of DCPs under appropriate conditions by water providers in order to enhance the availability of limited supplies during emergency and drought conditions and reduce impacts to water users and local economies. Recognizing that implementation of appropriate water management strategies is a matter of local choice, the NETRWPG supports consideration of economically viable drought management approaches as an interim strategy to meet near-term needs through demand reduction until such time as economically viable long-term water supplies can be developed.

Hence, the economic impacts on WUG reductions associated with increasing 5, 10, 15, 20, 25, and 30 percent drought management scenarios are shown in Table 7.8 for decades 2020 through 2070 for each municipal water user group with projected needs for additional water supply at year 2020.

These impacts were derived using the TWDB's Drought Management Costing Tool, which relies upon estimated foregone consumer surplus (consumer willingness to pay to restore normal water usage) and annual cost and usage surveys performed by the Texas Municipal League (TML). The household size data are for year 2010, and monthly prices and usage are from 2016. WUG-specific TML data were used when available. The costing tool is only applicable to residential outdoor water use. The WUGs with the greatest estimated economic impacts are Greenville, Texarkana, and Cash SUD.

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Table 7.8 Drought Management Strategy Evaluation Summary

Entity Name	Total Annual Water Reduction (Percentage and volume in ac-ft)						Total Annual Cost (in 2018 $)					
	5% 2020	10% 2030	15% 2040	20% 2050	25% 2060	30% 2070	2020	2030	2040	2050	2060	2070
ABLES SPRINGS WSC	5	16	36	69	124	213	1,115	7,140	24,848	67,350	160,693	356,372
B H P WSC	15	38	73	125	207	335	1,923	10,088	30,401	74,032	162,827	339,646
BURNS REDBANK WSC	7	15	22	30	37	44	888	3,852	9,256	17,484	29,139	44,958
CADDO BASIN SUD	33	89	177	318	543	904	3,065	17,154	54,490	138,443	315,104	675,311
CASH SUD	89	213	382	608	908	1,302	8,187	41,279	117,357	264,674	527,103	972,262
CELESTE	4	9	17	29	47	77	421	2,208	6,655	16,214	35,654	74,361
CENTRAL BOWIE COUNTY WSC	37	78	130	192	266	353	3,357	15,129	39,926	83,538	154,224	263,583
CLARKSVILLE	14	28	42	56	71	85	1,713	7,232	17,229	32,545	54,241	83,686
DE KALB	8	16	24	33	41	50	970	4,185	10,090	19,178	32,377	50,617
EAST MOUNTAIN WATER SYSTEM	10	21	34	48	63	79	1,178	5,371	13,625	27,301	47,961	77,533
EDOM WSC	5	11	17	24	32	42	599	2,768	7,050	14,207	25,558	42,505
GREENVILLE	260	597	1,052	1,692	2,631	4,055	19,466	94,403	264,370	602,322	1,248,332	2,474,082
HARLETON WSC	21	45	72	105	144	190	2,599	11,787	30,079	62,123	113,153	192,130
HICKORY CREEK SUD	16	48	102	193	342	585	2,032	12,541	42,673	113,995	269,286	593,229
HOLLY SPRINGS WSC	7	15	23	30	38	45	930	3,955	9,422	17,797	29,661	45,763
HOOKS	13	27	42	55	69	83	911	4,003	9,926	18,750	31,250	48,214
LINDALE	25	60	108	163	243	347	2,136	10,946	31,276	66,860	132,838	244,194
MABANK	1	2	4	6	11	19	133	627	1,647	4,069	9,470	20,364
MACEDONIA EYLAU MUD 1	41	83	126	167	209	251	3,753	16,117	38,599	72,908	121,514	187,479
MAUD	5	12	19	25	32	38	593	2,765	7,211	13,620	22,701	35,024
MILLER GROVE WSC	6	13	21	29	39	49	780	3,539	8,918	17,428	30,681	49,805
NASH	16	37	63	95	118	142	1,451	7,153	19,480	41,402	69,004	106,463
NEW BOSTON	25	52	79	106	132	159	2,268	9,847	23,653	44,678	74,464	114,887

Entity Name	Total Annual Water Reduction (Percentage and volume in ac-ft)						Total Annual Cost (in 2018 $)					
	5% 2020	10% 2030	15% 2040	20% 2050	25% 2060	30% 2070	2020	2030	2040	2050	2060	2070
NORTH HUNT SUD	17	43	85	149	250	411	2,101	11,396	35,290	87,866	196,796	416,546
OVERTON	0	1	1	1	2	3	23	111	306	663	1,268	2,254
POETRY WSC	9	24	45	78	131	211	1,182	6,302	18,931	46,102	103,028	213,957
POINT	7	14	22	29	37	44	834	3,734	9,037	17,241	28,894	44,662
QUITMAN	10	22	33	45	57	70	1,706	7,508	18,172	35,180	59,347	92,256
REDWATER	13	30	51	75	98	117	1,564	7,448	19,759	41,126	71,714	110,644
RIVERBEND WATER RESOURCES DISTRICT	1	3	4	5	6	8	156	677	1,627	3,073	5,121	7,902
ROYSE CITY	1	3	6	10	17	28	159	833	2,508	6,108	13,438	28,053
SCOTTSVILLE	5	10	17	24	33	44	600	2,723	6,948	14,352	26,134	44,353
SOUTH TAWAKONI WSC	20	46	75	109	145	183	2,523	12,111	31,499	64,476	114,338	185,513
STAR MOUNTAIN WSC	7	14	24	35	48	64	811	3,804	9,994	20,837	38,161	64,599
TEXARKANA	168	350	548	763	996	1,247	11,464	50,527	125,649	247,744	431,007	694,132
WAKE VILLAGE	33	73	121	177	240	288	2,855	13,428	35,259	72,776	131,585	203,017
WASKOM	14	29	47	69	94	124	1,711	7,759	19,802	40,883	74,475	126,452
WEST TAWAKONI	12	29	51	84	133	207	2,759	13,614	38,785	89,853	189,150	380,186

7.7 Other Drought-related Considerations and Recommendations

31 TAC 357.42(f), (h)&(i) state that RWPGs shall consider any relevant recommendations from the Drought Preparedness Council. Additionally, RWPGs shall make drought preparation and response recommendations regarding: development of, content contained within, and implementation of local DCPs required by the Commission; current drought management preparations in the RWPA including (drought response triggers, responses to drought conditions); the Drought Preparedness Council and the State Drought Preparedness Plan; and any other general recommendations regarding drought management in the Region or State.

7.7.1 Texas Drought Preparedness Council

The Drought Preparedness Council was authorized and established by the 76th legislature (HB 2660) in 1999, subsequent to the establishment of the Drought Monitoring and Response Committee (75th legislature, SB1). The Council is described in Chapter 16, Section 2, Subchapter C of the Texas Water Code, and was created to carry out the provisions of Sections 16.055 and 16.0551 of the Code. The drought preparedness council is responsible for:

1. the assessment and public reporting of drought monitoring and water supply conditions;
2. advising the governor on significant drought conditions;
3. recommending specific provisions for a defined state response to drought related disasters for inclusion in the state emergency management plan and the state water plan;
4. advising the regional water planning groups on drought-related issues in the regional water plans;
5. ensuring effective coordination among state, local, and federal agencies in drought-response planning; and
6. reporting to the legislature, not later than January 15 of each odd-numbered year, regarding significant drought conditions in the state.

The Drought Preparedness Council has a significant role in Texas with regard to drought monitoring, advising the governor and other groups, and coordinating amongst state and federal agencies. The Council has produced the State Drought Preparedness Plan, establishing a framework for approaching drought in Texas that attempts to minimize the impacts of drought on people and resources.

Per the recommendations of the Texas Drought Preparedness Council provided to the NETRWPG in a August 1, 2019 letter, portions of this chapter have been formulated consistent with the outline template for Chapter 7 provided by the TWDB. Additionally, water supplies developed for the 2021 Region D Plan have been based upon firm yield/100% reliability of existing supply, thus accounting for significant drought conditions experienced historically by North East Texas. Availability determinations have been based upon full utilization of existing, permitted water rights, while demand projections have been based upon per capita usage amounts from the year 2011, a period of significant drought in the region. Each of these factors allow a margin of safety when considering risks associated with droughts more significant than the DOR, in an effort to address and plan for responses to extreme drought conditions.

The NETRWPG supports the Texas Drought Preparedness Council, and recommends that water providers and others regularly review the Council's Situation Reports as part of their drought monitoring efforts. These reports can be found at:

https://www.dps.texas.gov/dem/sitrep/default.aspx

7.7.2 Development and Implementation of DCPs

The NETRWPG recognizes that DCPs developed by water providers within the RWPA are the best available approach for drought management, and makes the following recommendations:

- In addition to monitoring procedures within the DCP, consider regular monitoring of information from TCEQ, TWDB, the Texas Drought Preparedness Council, and the U.S. Drought Monitor.
- Coordination with water providers regarding the identification of drought conditions and implementation of the DCP, particularly during times of drought.
- Communication with water customers during times of drought to ensure adequate implementation of drought management measures.
- Regular consideration of updating the DCP to reflect recent changes in the status of demand, water sources, infrastructure, or service area.

Presented in Table 7.9 is a list of wholesale water providers and/or retail entities within Region D that have reported to the TCEQ their implementation of drought contingency measures since 2015.

Table 7.9 Region D Retail and Wholesale Water Providers Reporting Implementation of Drought Contingency Measures since 2015

Date	Name	County	Source	Condition	Implementation Status
1/6/2015	CITY OF HALLSVILLE	Harrison	SWP from City of Longview (Sabine River, Lake Cherokee, and Lake O The Pines) and 2 Carrizo Sand wells	Not experiencing any drought problems at this time.	Not implementing a stage of drought contingency plan.
1/15/2015	CITY OF WEST TAWAKONI	Hunt	Lake Tawakoni	Having drought related issues. Lake Tawakoni is 12.5 ft low. There is 3.5 to 4 feet of water above current back-up intake line.	Currently implementing Voluntary Stage of Drought Contingency Plan (DCP). The system is adopting a new DCP and once it is passed the watering restrictions will become stricter. Working to secure funds for extension of current back-up system or a new intake structure.

Date	Name	County	Source	Condition	Implementation Status
2/11/2015	COMBINED CONSUMERS SUD	Hunt	Lake Tawakoni	Low lake levels at Lake Tawakoni. Six feet of water above surface water intake.	Implementing PWS Stage 3, which allows outdoor watering using a hose-end sprinkler or automatic irrigation system twice a week based on address from midnight to 10am and 8pm to midnight.
3/2/2015	CITY OF WEST TAWAKONI	Hunt	Lake Tawakoni	Low lake levels near surface water intake on Lake Tawakoni.	Implementing PWS Stage 5 watering restrictions, which prohibits all outdoor watering.
3/6/2015	COMBINED CONSUMERS SUD	Hunt	Lake Tawakoni	Lake Tawakoni levels have risen from recent precipitation events.	Implementing PWS Stage 2, which allows outdoor watering twice a week based on address between midnight to 10am and 8pm to midnight on designated days.
3/18/2015	COMBINED CONSUMERS SUD	Hunt	Lake Tawakoni	Lake Tawakoni's water level has risen from recent rains.	Implementing PWS Stage 2, which requests customers to voluntarily limit irrigation of landscaped areas to twice a week based on physical address between midnight and 10am and 8pm to midnight.
4/8/2015	CITY OF MARSHALL	Harrison	Big Cypress Bayou	Mechanical problem. Water line to water plant broke. Treatment plant shut down until repair is made.	Contractor on sight. Repair to be finished soon. Stage 4 of DCP enacted at 4 p.m. on April 8, 2015.
4/9/2015	CITY OF MARSHALL	Harrison	Big Cypress Bayou	Mechanical problem resolved. Water line to plant repaired at 8 pm on April 8, 2015. Began treating water at water plant and filling clearwell reserves.	PWS Stage 4 watering restrictions rescinded.
4/27/2015	COMBINED CONSUMER SUD	Hunt	Lake Tawakoni	Precipitation and available supply meet our needs.	We are lifting our drought restrictions.

Date	Name	County	Source	Condition	Implementation Status
5/5/2015	CITY OF WEST TAWAKONI	Hunt	Lake Tawakoni	Lake Tawakoni's water level is four feet below the conservation level.	We are asking customers to voluntarily limit water usage. There are no other restrictions.
5/27/2015	CITY OF EMORY	Rains	Lake Tawakoni	Lake Tawakoni is at 100% capacity.	No remedial action required. The City is not implementing a stage of their DCP.
6/18/2015	WEST HARRISON WSC	Harrison	3 Carrizo Sand and 1 Wilcox Aquifer	Implementing Stage 1 of the DCP	There are no outdoor watering restrictions. Asking customers to voluntarily conserve outdoor watering
7/6/2015	WEST HARRISON WSC	Harrison	3 Carrizo Sand wells and 1 Wilcox well	Relaxed outdoor watering restrictions and now implementing the Voluntary stage of the DCP	Asking customers to voluntarily conserve water. No mandatory outdoor watering restrictions
9/14/2015	CASH SUD	Hunt	SWP from North Texas MWD Wylie WTP (Lavon Lake) and Lake Tawakoni	Implementing the voluntary stage of the DCP	Asking customers to restrict watering to once every five days based on address
9/14/2015	MACBEE SUD	Van Zandt	Lake Tawakoni	Not implementing any stage of the DCP	No outdoor watering restrictions
9/14/2015	LINDALE RURAL WSC	Smith	4 Wilcox Aquifer wells and 2 Carrizo Sand wells	Not implementing any stage of the DCP	No outdoor watering restrictions
9/14/2015	LINDALE RURAL WSC DC	Smith	3 Wilcox Aquifer wells	Not implementing any stage of the DCP	No outdoor watering restrictions
9/14/2015	SAND FLAT WSC	Smith	4 Carrizo Sand wells	Not implementing any stage of the DCP	No outdoor watering restrictions
9/14/2015	BEN WHEELER WSC	Van Zandt	3 Wilcox Aquifer wells and 1 Carrizo-Wilcox well	Not implementing any stage of the DCP	No outdoor watering restrictions

Date	Name	County	Source	Condition	Implementation Status
8/2/2016	PINE TRAIL SHORES	Smith	1 Queen City well	The system has implemented stage 1 of their DCP due to excessive water use.	Outdoor watering is limited to twice weekly between the hours of either 12am - 4am, 7am -10am or 8pm -11:59pm dependent on address. Hand watering is allowed any day between 12am-10am and 7pm - 11:59pm.
10/5/2017	RIVERBEND WATER RESOURCES DISTRICT	Bowie	Lake Wright Patman and Lake Millwood	NA	NA
10/17/2018	CITY OF HALLSVILLE	Harrison	SWP from City of Longview (Sabine River, Lake Cherokee, and Lake O The Pines) and 2 Carrizo Sand wells	No drought related problems or mechanical issues at this time.	Voluntary water conservation at this time.
2/28/2019	CITY OF YANTIS	Wood	Carisso-Wilcox Aquifer	NA	NA
4/16/2019	CADDO LAKE WSC	Harrison	4 Wilcox wells	NA	NA
4/24/2019	CITY OF AVERY	Red River	SWP from City of Texarkana	NA	NA
11/19/2019	PINE TRAIL SHORES	Smith	1 Queen City well	No longer experiencing any drought related issues.	The system is implementing a voluntary water conservation stage of their DCP.

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Appendix C7 – Chapter 7:

DROUGHT RESPONSE INFORMATION, ACTIVITIES, AND RECOMMENDATIONS

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APPENDIX C7

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Region D 2021 - North East Texas Regional Water Plan
TCEQ Listed Drought-Affected Entities as of July 2019

PWS ID	PWS Name	County	Priority	TCEQ Stage	Population	Connections	Date Notified
190021	RIVERBEND WATER RESOURCES DISTRICT	BOWIE	W	V	5180	3363	10/5/2017
600001	CITY OF COOPER	DELTA	W	2	2146	1060	8/19/2013
920028	SUN ACRES MOBILE HOME PARK	GREGG	W	2	183	61	9/4/2013
920006	CITY OF WHITE OAK	GREGG	W	2	7119	2991	8/26/2013
1020004	CITY OF HALLSVILLE	HARRISON	W	V	3577	1400	10/17/2018
1020078	WEST HARRISON WSC	HARRISON	W	V	1437	479	7/6/2015
1120011	BRINKER WSC	HOPKINS	W	V	2508	836	9/13/2013
1120018	PICKTON WSC	HOPKINS	W	V	654	218	9/13/2013
1120013	CORNERSVILLE WSC	HOPKINS	W	V	1089	363	8/13/2013
1120015	MARTIN SPRINGS WSC	HOPKINS	W	V	3549	1183	7/19/2013
1120001	CITY OF CUMBY	HOPKINS	W	1	777	451	7/18/2013
1160018	CASH SUD	HUNT	W	V	16542	5908	9/14/2015
1160012	CITY OF WEST TAWAKONI	HUNT	W	V	3600	1250	5/5/2015
1160004	CITY OF GREENVILLE	HUNT	W	V	25557	9506	10/29/2013
1160006	CITY OF LONE OAK	HUNT	W	V	598	286	8/26/2013
1160031	JACOBIA WSC	HUNT	W	2	972	324	8/21/2013
1160029	CADDO BASIN SUD	HUNT	W	1	10419	3473	8/19/2013
1160042	SHADY GROVE SUD	HUNT	W	1	1374	458	7/16/2013
1160007	CITY OF QUINLAN	HUNT	W	1	2448	816	7/15/2013
1160005	CITY OF WOLFE CITY	HUNT	W	1	1412	620	7/25/2012
1160028	HOLIDAY ESTATES WATER	HUNT	W	V	216	72	4/23/2012
1160017	CAMPBELL WSC	HUNT	W	V	1482	494	3/19/2012
1390012	PETTY WSC	LAMAR	W	V	132	44	11/20/2011
1390001	CITY OF DEPORT	LAMAR	W	1	927	309	9/30/2011
1900011	CITY OF EAST TAWAKONI	RAINS	W	1	1959	945	5/1/2014
1900009	SOUTH RAINS SUD	RAINS	W	2	2847	949	3/31/2014
1940002	CITY OF CLARKSVILLE	RED RIVER	W	V	3237	1610	9/9/2013
2120005	EAST TEXAS MUD OF SMITH COUNTY	SMITH	W	1	2343	781	9/30/2011
2300002	CITY OF GILMER	UPSHUR	W	1	5243	2844	9/12/2011
2300008	UNION GROVE WSC	UPSHUR	W	V	2793	931	8/26/2011
2340009	EDOM WSC	VAN ZANDT	W	V	1443	481	5/2/2013
2340007	CALLENDER LAKE	VAN ZANDT	W	1	1842	614	3/26/2012
2500007	JONES WSC	WOOD	W	V	5352	1784	8/25/2013
2500015	BRIGHT STAR-SALEM SUD	WOOD	W	1	5871	1957	8/10/2011

Priority of Water Use

Priority	Description
O - Outage	Water service interrupted.
E - Emergency	Could be out of water in 45 days or less.
P - Priority	Could be out of water in 90 days or less.
C - Concern	Could be out of water in 180 days or less.
W - Watch	Has greater than a 180-day supply of water remaining.
R - Resolved	No longer experiencing water capacity problems.

TCEQ Drought Response Stages

TCEQ Stage	Description
V - Voluntary	Customers requested to voluntarily limit water use.
1 - Mild restrictions	Use of water for non-essential uses is restricted (i.e. outdoor watering limited to no more than twice or once a week)
2 - Moderate restrictions	All outdoor water usage is prohibited except by hand-held hoses with manual on/off nozzles. Water usage for livestock is exempt from this restriction.
3 - Severe restrictions	All outdoor water usage is prohibited; livestock watering may be exempted by the utility. All consumption may also be limited to each customer in specific ways.
Date Notified	The "date notified" is the most recent date that the Public Water System notified TCEQ of changes to their drought response stage.

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7.2MODEL DROUGHT CONTINGENCY PLAN – WHOLESALE WATER PROVIDERS

General Information

Introduction

Drought is a very real natural disaster that occurs in Texas, even in the verdant bottomlands, green pastures, and piney woods of northeast Texas. As recently as 2008, drought strained water systems in the northeast Texas region. In addition to natural drought, there are also water supply emergencies that occur from time to time in which water supply becomes contaminated. A good example of this is the MTBE spill into Lake Tawakoni in May 2000, which contaminated supply for several Hunt County water systems for multiple days.

In an effort to better respond to drought conditions than we've been able to in the past, the North East Texas Regional Water Planning Group (NETRWPG) has prepared this document, with the idea that if water providers study their water supply system before a drought or emergency occurs, then they will be better prepared to respond. In preparing this document, several references were used, including Chapters 288 and 363 of the Texas Administrative Code, the Texas Commission on Environmental Quality's (TCEQ) 'Handbook for Drought Contingency Planning for Retail Public Water Suppliers,' Texas Water Code § 11.1272, and the TCEQ and TWDB websites. All of these resources are available to you if you need further information or clarification. You may also contact the TCEQ at 512-239-4691 with questions or for information. Example wording for your plan will be found throughout in bold italics.

According to the requirements set forth in the amended Chapter 288, Subchapter C of the Texas Administrative Code, retail public water suppliers providing water service to 3,300 or more connections must submit revisions to existing drought contingency plans to the executive director not later than May 1, 2009, and every five years after that date to coincide with the regional water planning group. Any new or revised plans must be submitted to the executive director within 90 days of adoption by the community water system. Any new retail public water suppliers providing water service to 3,300 or more connections shall prepare and adopt a drought contingency plan within 180 days of commencement of operation, and submit the plan to the executive director within 90 days of adoption. If you are a retail supplier, but serve less than 3,300 connections, you are still required to develop and implement a plan, but you do not need to submit the plan unless specifically requested by TCEQ. If you provide retail supply in addition to wholesale supply, you will also need to develop a retail drought contingency plan. Please see the Northeast Texas Region's guidance for retail drought contingency plans.

The _____(water provider) understands that water conservation is a viable strategy for protecting water resources both now and in the future, and that adequate planning for times of drought or emergency is a necessary part of conservation. The purpose of this plan is to prepare for the possibility of a drought or emergency situation where water is in short supply. This plan will help to ensure that _____(water supplier) and its wholesale customers use water wisely and efficiently during periods of drought.

Though not specifically required by rule, it is helpful to the reader if you summarize your water supply and distribution systems in the introduction. This will familiarize users of the Plan with your system, and help them to make sense of the actions that you intend to take. In addition, discussing your water system here will assist those who update the plan in five years, because they will know exactly what the system looked like when the plan was created.

The _____(water supplier) utilizes groundwater /surface water from _____(source). Supply is secured by a (water right, water supply contract, etc.) through the year _____. Our customers include _____, and their current contracted amounts are _____. Our storage and distribution systems consist of _____.

Coordination with the North East Texas Regional Water Planning Group

The drought contingency plan must document coordination with the regional water planning groups for the service area of the wholesale public water supplier to ensure consistency with the appropriate approved regional water plans. – 30 TAC Chapter 288

A copy of this adopted plan will be submitted to the NETRWPG via its administrator, Mr. Walt Sears, Northeast Texas Municipal Water District, P. O. Box 955, Hughes Springs, Texas 75656. Proof of submittal is attached hereto as Figure ___.

Informing the Public/Requesting Input

According to 30 TAC Chapter 288, Subchapter B.a.1, "Preparation of the plan shall include provisions to actively inform the public and to affirmatively provide opportunity for user input in the preparation of the plan and for informing wholesale customers about the plan. Such acts may include, but are not limited to, having a public meeting at a time and location convenient to the public and providing written notice to the public concerning the proposed plan and meeting."

The _____(water supplier) gave the public and its wholesale customers an opportunity to provide input into this plan by _____(public notice, public hearing, letter requesting comments, etc.). Public comments included _____.

Efforts to inform wholesale customers and the public about each stage of the plan, and when stages are implemented or rescinded, will be through _____ (certified letter, newspaper articles, radio announcements, website announcements, etc.).

Authorization/Applicability

The _____ (mayor, president, city administrator, etc.) is hereby authorized to monitor weather conditions as well as water supply and demand conditions and to implement the Drought Contingency Plan as appropriate.

The _____(City Council, Board of Directors, etc.) authorizes the Plan by a _____(resolution, ordinance), which has been included in this Plan.

Coordination with the Texas Commission on Environmental Quality

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According to 30 TAC Chapter 288, Subchapter C, "Wholesale public water suppliers shall submit a drought contingency plan meeting the requirements of Subchapter B of this chapter to the executive director not later than May 1, 2005, after adoption of the drought contingency plan by the governing body of the water supplier. Thereafter, the wholesale public water suppliers shall submit the next revision of the plan not later than May 1, 2009, and every five years after that date to coincide with the regional water planning group. Any new or revised plans must be submitted to the executive director within 90 days of adoption by the governing body of the wholesale public water supplier."

This plan was submitted to the executive director of the Texas Commission of Environmental Quality on _____(date).

Send your plan to the following address: TCEQ, Resource Protection Team, Mail Code 160, P.O. Box 13087, Austin, TX 78711-3087 for regular and certified mail, or 12100 Park 35 Circle, Austin, TX 78753 for express carrier deliveries (U.S. Post Office Express Mail, FedEx, UPS, etc.).

For questions to the TCEQ, see the website at www.tceq.state.tx.us, or call: 512/239-4691.

Coordination with Wholesale Water Supplier

This section only applies if you purchase supply from a wholesale provider. If you have a contract or agreement with a water provider, then complete this section. If you have your own water rights or otherwise own your supply, this section does not apply.

This plan has been created with our water provider, _____'s drought contingency plan in mind. We have included _____'s (water provider) requirements within our plan and have created this plan to compliment _____'s (water provider) plan. _____(water provider) has been provided a copy of this plan.

Plan Definitions

For the purposes of this Plan**,** the following definitions, taken from TCEQ guidance, shall apply:

Aesthetic water use: water use for ornamental or decorative purposes such as fountains, reflecting pools, and water gardens.

Commercial and institutional water use: water use which is integral to the operations of commercial and non-profit establishments and governmental entities such as retail establishments, hotels and motels, restaurants, and office buildings.

Conservation: those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water or increase the recycling and reuse of water so that a supply is conserved and made available for future or alternative uses.

Customer: any person, company, or organization using water supplied by _____ (name of water supplier).

Domestic water use: water use for personal needs or for household or sanitary purposes such as drinking, bathing, heating, cooking, sanitation, or for cleaning a residence, business, industry, or institution.

Even number address: street addresses, box numbers, or rural postal route numbers ending in 0, 2, 4, 6, or 8 and locations without addresses.

Industrial water use: the use of water in processes designed to convert materials of lower value into forms having greater usability and value.

Landscape irrigation use: water used for the irrigation and maintenance of landscaped areas, whether publicly or privately owned, including residential and commercial lawns, gardens, golf courses, parks, rights-of-way and medians.

Non-essential water use: water uses that are not essential nor required for the protection of public, health, safety, and welfare, including:

(a) irrigation of landscape areas, including parks, athletic fields, and golf courses, except otherwise provided under this Plan;
(b) use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle;
(c) use of water to wash down any sidewalks, walkways, driveways, parking lots, tennis courts, or other hard-surfaced areas;
(d) use of water to wash down buildings or structures for purposes other than immediate fire protection;
(e) flushing gutters or permitting water to run or accumulate in any gutter or street;

(f) use of water to fill, refill, or add to any indoor or outdoor swimming pools or jacuzzi-type pools;
(g) use of water in a fountain or pond for aesthetic or scenic purposes except where necessary to support aquatic life;
(h) failure to repair a controllable leak(s) within a reasonable period after having been given notice directing the repair of such leak(s); and
(i) use of water from hydrants for construction purposes or any other purposes other than fire fighting.

Odd numbered address: street addresses, box numbers, or rural postal route numbers ending in 1, 3, 5, 7, or 9.

RESPONSE TO A DROUGHT EVENT

In this portion of the plan, it will need to be determined whether a water constraint will more likely be caused by a shortage in water supply or by constraints in the storage and distribution system. Associated goals and water management measures should correspond to the type of constraint expected. For example, if insufficient storage is determined to be the most likely cause of water shortage during a drought, then an emergency back-up supply source would not solve the problem; reduced use during peak hours (banning lawn watering, etc.) would more likely solve the problem by giving storage tanks a better opportunity to refill.

The drought contingency plan should be designed for a drought condition at least as severe as the drought of record according to TCEQ rules. Since the drought of record in Texas occurred in the 1950's, few systems will have water use records still available to plan by. Therefore, the NETRWPG suggests using the most recent drought for the State, which occurred in 1996. If your system does not have records for 1996, use the time period in your records when your system was the most strained by dry weather conditions.

The drought contingency plan must include a minimum of three drought or emergency response stages providing for the implementation of measures in response to water supply conditions during a repeat of the drought-of-record. – 30 TAC Chapter 288

The drought contingency plan must include specific, quantified targets for water use reductions to be achieved during periods of water shortage and drought. The entity preparing the plan shall establish the targets. The goals established by the entity under this paragraph are not enforceable. – 30 TAC Chapter 288

A minimum of three drought stages is required in this plan. During each stage, it will need to be determined what will trigger initiation, what the water use reduction target goal is, what water management strategies will be put into place, and, finally, what will terminate the stage. Keep in mind that a supplier who is also a customer of its wholesale provider must comply with its provider's Drought Contingency Plan. Do not develop stages or management strategies that are in conflict with your water provider's DCP. Also note that the NETRWPG has developed water

management strategies for all providers who are projected to have a water shortage within the planning period (50 years). You should review the latest version of the Regional Water Plan to determine if you have had strategies prepared for you.

Include an opening paragraph in this section that describes what information should be monitored in order to initiate the stages, and a rationale of why you chose the triggering criteria that you chose.

The drought contingency plan must include a provision in every wholesale water contract entered into or renewed after adoption of the plan, including contract extensions, that in case of a shortage of water resulting from drought, the water to be distributed shall be divided in accordance with Texas Water Code, §11.039. – 30 TAC Chapter 288

Texas Water Code, §11.039 states, "DISTRIBUTION OF WATER DURING SHORTAGE. (a) If a shortage of water in a water supply not covered by a water conservation plan prepared in compliance with Texas Natural Resource Conservation Commission or Texas Water Development Board rules results from drought, accident, or other cause, the water to be distributed shall be divided among all customers pro rata, according to the amount each may be entitled to, so that preference is given to no one and everyone suffers alike. (b) If a shortage of water in a water supply covered by a water conservation plan prepared in compliance with Texas Natural Resource Conservation Commission or Texas Water Development Board rules results from drought, accident, or other cause, the person, association of persons, or corporation owning or controlling the water shall divide the water to be distributed among all customers pro rata, according to: (1) the amount of water to which each customer may be entitled; or (2) the amount of water to which each customer may be entitled, less the amount of water the customer would have saved if the customer had operated its water system in compliance with the water conservation plan.(c) Nothing in Subsection (a) or (b) precludes the person, association of persons, or corporation owning or controlling the water from supplying water to a person who has a prior vested right to the water under the laws of this state.

Stage 1 – Mild Water Shortage

Initiation: The _____(name of water supplier) will consider that a mild water shortage exists when_____ (i.e. water levels in the reservoir reach_____; average daily water use reaches ___% of capacity for three consecutive days; water level in elevated storage tank is at or below ____ for more than 12 hours, etc.)***, or when requested by*** _____ (entity's water provider) if applicable**.**

Target Goal: When a mild water shortage exists, the _____(water supplier) will implement water management strategies in an attempt to reduce daily water use to _____ (i.e. 2 MGD; ___% of average daily water use, etc.) Please note that this goal must be quantifiable. Goals established in this section are not enforceable.

Termination: Stage 1 shall be rescinded when _____ (i.e. water levels in the reservoir rise above ___ for 7 consecutive days; average daily water use falls below ___% of capacity for three consecutive days; storage facilities return to normal levels for 24 consecutive hours, etc.)***, or when Stage I is rescinded by*** _____ (entity's water provider) if applicable***.***

Water Management Strategies: During Stage 1, we will take the following steps to reduce water use:_____.

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive. When determining strategies, remember the type of constraint you expect on your system and plan accordingly.

The drought contingency plan must include the specific water supply or water demand management measures to be implemented during each stage of the plan including, but not limited to, the following: (A) pro rata curtailment of water deliveries to or diversions by wholesale water customers as provided in Texas Water Code, §11.039; and (B) utilization of alternative water sources with the prior approval of the executive director as appropriate, e.g. interconnection with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.). – 30 TAC Chapter 288

- Request voluntary water conservation from all customers
- Recommend that customers initiate Stage 1 of their Drought Contingency Plans
- Reduce operating procedures that use water (i.e. flushing of mains) as appropriate

<u>Stage 2 – Moderate Water Shortage</u>

Initiation: The _____(water supplier) will consider that a moderate water shortage exists when_____(i.e. water levels in the reservoir reach_____; average daily water use reaches ___% of capacity for three consecutive days; water level in elevated storage tank is at or below ____ for more than 12 hours, etc.)***, or when requested by _____ (entity's water provider)*** if applicable.

Target Goal: When a moderate water shortage exists, the _____(water supplier) will implement water management strategies in an attempt to reduce daily water use to _____ (i.e. 2 MGD; ___% of average daily water use, etc.) Please note that this goal must be quantifiable. Goals established in this section are not enforceable.

Termination: Stage 2 shall be rescinded when _____ (i.e. water levels in the reservoir rise above ___ for 7 consecutive days; average daily water use falls below ___% of capacity for three consecutive days; storage facilities return to normal levels for 24 consecutive hours, etc.)***, or when Stage 2 is rescinded by***

_____ (entity's water provider) if applicable. ***Upon termination of Stage 2, Stage 1 becomes operative.***

Water Management Strategies: During Stage 2, we will take the following steps to reduce water use:_____.

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive. When determining strategies, remember the type of constraint you expect on your system and plan accordingly.

The drought contingency plan must include the specific water supply or water demand management measures to be implemented during each stage of the plan including, but not limited to, the following: (A) pro rata curtailment of water deliveries to or diversions by wholesale water customers as provided in Texas Water Code, §11.039; and (B) utilization of alternative water sources with the prior approval of the executive director as appropriate, e.g. interconnection with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.). – 30 TAC Chapter 288

- Recommend that customers initiate Stage 2 of their Drought Contingency Plans, which should, at a minimum, contain lawn watering restrictions
- Modify reservoir operations if applicable
- Initiate strong public awareness campaign in service area to warn of impending shortages

<u>Stage 3 – Severe Water Shortage</u>

Initiation: The _____(water supplier) will consider that a severe water shortage exists when_____(i.e. water levels in the reservoir reach_____; average daily water use reaches ___% of capacity for three consecutive days; water level in elevated storage tank is at or below ____ for more than 12 hours, etc.)***, or when requested by _____*** (entity's water provider) if applicable***.***

Target Goal: When a severe water shortage exists, the _____(water supplier) will implement water management strategies in an attempt to reduce daily water use to _____ (i.e. 2 MGD; ___% of average daily water use, etc.) Please note that this goal must be quantifiable. Goals established in this section are not enforceable.

Termination: Stage 3 shall be rescinded when _____ (i.e. water levels in the reservoir rise above ___ for 7 consecutive days; average daily water use falls below ___% of capacity for three consecutive days; storage facilities return to normal levels for 24 consecutive hours, etc.)***, or when Stage 3 is rescinded by*** _____ (entity's water provider) if applicable***. Upon termination of Stage 3, Stage 2 becomes operative.***

Water Management Strategies: During Stage 3, we will take the following steps to reduce water use:_____.

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive. When determining strategies, remember the type of constraint you expect on your system and plan accordingly.

The drought contingency plan must include the specific water supply or water demand management measures to be implemented during each stage of the plan including, but not limited to, the following: (A) pro rata curtailment of water deliveries to or diversions by wholesale water customers as provided in Texas Water Code, §11.039; and (B) utilization of alternative water sources with the prior approval of the executive director as appropriate, e.g. interconnection with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.). – 30 TAC Chapter 288

- Recommend that customers initiate Stage 3 of their Drought Contingency Plans, which, at a minimum, must include a ban on lawn watering
- Begin pro rata water allocation (Pro rata curtailment of water deliveries to or diversions by wholesale water customers must be considered in a wholesale DCP according to 30 TAC Chapter 288, Subchapter B. Rules for pro rata curtailment are provided in Texas Water Code, §11.039.)
- Implement water rate surcharges (i.e. a set charge for any use above average monthly use)
- Implement price adjustments (i.e. increase the price per 1,000 gallons of water used above the average monthly use)
- Utilize alternate or emergency water sources

Stage 4 – Emergency Water Shortage

This Stage could apply in the instance of a major water line break, a contamination of the water supply source, or other urgent water system conditions. Most likely, this stage would be initiated by decision of the authorized plan implementer (Mayor, President, Manager, etc.)

Initiation: The _____(water supplier) will consider that an emergency water shortage exists when_____ (i.e. the water main at the water treatment plant bursts or is otherwise significantly damaged; the reservoir is contaminated by oil spill; etc.,)***, or when requested by _____*** (entity's water provider) if applicable.

Target Goal: When an emergency water shortage exists, the _____(water supplier) will implement water management strategies in an attempt to reduce daily water use to _____ (i.e. 2 MGD; ___% of average daily water use, etc.) Please note that this goal must be quantifiable. Goals established in this section are not enforceable.

Termination: Stage 4 shall be rescinded when _____ (i.e. the main at the water treatment plant is restored and storage tanks have been allowed to refill; analysis of the source water indicates that supply is safe to use; etc.), ***or when Stage 4 is rescinded by*** _____(entity's water provider) if applicable.

Water Management Strategies: During Stage 4, we will take the following steps to reduce water use:_____.

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive. When determining strategies, remember the type of constraint you expect on your system and plan accordingly.

The drought contingency plan must include the specific water supply or water demand management measures to be implemented during each stage of the plan including, but not limited to, the following: (A) pro rata curtailment of water deliveries to or diversions by wholesale water customers as provided in Texas Water Code, §11.039; and (B) utilization of alternative water sources with the prior approval of the executive director as appropriate, e.g. interconnection with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.). – 30 TAC Chapter 288

- Utilize alternative or emergency water supplies (i.e. tying into a neighboring water system, etc. This may require approval by the TCEQ Executive Director)
- Modify reservoir operations
- Strategies listed in Stage 3

PLAN EXECUTION

Public Involvement

This section should discuss the ways in which the supplier will inform its wholesale customers about the initiation and termination of drought stages, as well as management strategies that customers are expected to follow. Public involvement can be in the form of special public hearings, articles and notices in the local newspaper, radio announcements, announcements on local television stations, notices in billing statements, etc.

The _____ (water provider) will keep its customers apprised of initiation of the drought contingency plan, and changes in stages, by means of _____.

Enforcement

The _____ (Mayor, City Manager, President, etc.), or his/her designee, is responsible for monitoring weather conditions and water supplies, and determining when to initiate and terminate stages of the DCP.

The drought contingency plan must include procedures for the enforcement of any mandatory water use restrictions including specification of penalties (e.g., liquidated damages, water rate surcharges, discontinuation of service) for violations of such restrictions. – 30 TAC Chapter 288, Subchapter B.a.10.

The _____ (governing body) has adopted this plan through _____ (ordinance, resolution), and has made it an official _____ (city, Corporation, etc.) policy. The _____ (ordinance, resolution, etc.) is attached hereto as Figure ___.

Provision for responding to wholesale provider restrictions

Any water supplier that receives all or a portion of its water supply from another water supplier shall consult with that supplier and shall include in the drought contingency plan appropriate provisions for responding to reductions in that water supply. – 30 TAC Chapter 288

If you have a wholesale provider, then add this section. If you own your own supply, please skip this section.

As stated in each water shortage stage, we intend to comply with all requirements of our wholesale provider's drought contingency plan. This plan is as stringent as our provider's plan, and in some cases may be more so.

Notification of TCEQ on mandatory provisions

A wholesale or retail water supplier shall notify the executive director within five business days of the implementation of any mandatory provisions of the drought contingency plan. – 30 TAC Chapter 288

The Executive Director at TCEQ shall be notified with 5 business days if any mandatory provisions of this plan are implemented. The Executive Director can be reached at 512-239-3900.

Variance procedures

The drought contingency plan must include procedures for granting variances to the plan. – 30 TAC Chapter 288

The _____ (authorized representative) may, in writing, grant temporary variance for existing water uses otherwise prohibited under this Plan if it is determined that failure to grant such variance would cause an emergency condition adversely affecting the health, sanitation, or fire protection for the public or the customer requesting such variance and if one or more of the following conditions are met:

(a) Compliance with this Plan cannot be technically accomplished during the duration of the water supply shortage or other condition for which the Plan is in effect.

(b) Alternative methods can be implemented which will achieve the same level of reduction in water use.

Customers requesting an exemption from the provisions of this Plan shall file a petition for variance with the _____ (water supplier) within 5 days after the Plan or a particular drought response stage has been invoked. All petitions for variances shall be reviewed by the _____ (authorized representative), and shall include the following:

(a) Name and address of the petitioner(s).
(b) Purpose of water use.
(c) Specific provision(s) of the Plan from which the petitioner is requesting relief.
(d) Detailed statement as to how the specific provision of the Plan adversely affects the petitioner or what damage or harm will occur to the petitioner or others if petitioner complies with this Ordinance.
(e) Description of the relief requested.
(f) Period of time for which the variance is sought.
(g) Alternative water use restrictions or other measures the petitioner is taking or proposes to take to meet the intent of this Plan and the compliance date.
(h) Other pertinent information.

Variances granted by the _____ (water supplier) shall be subject to the following conditions, unless waived or modified:

(a) Variances granted shall include a timetable for compliance.
(b) Variances granted shall expire when the Plan is no longer in effect, unless the petitioner has failed to meet specified requirements.

No variance shall be retroactive or otherwise justify any violation of this Plan occurring prior to the issuance of the variance.

5-year updates

The retail public water supplier shall review and update, as appropriate, the drought contingency plan, at least every five years, based on new or updated information, such as the adoption or revision of the regional water plan. – 30 TAC Chapter 288

This plan shall be re-evaluated and updated every five years based on updated information; especially the latest adopted NETRWPG Regional Water Plan.

7.2 MODEL DROUGHT CONTINGENCY PLAN –GROUNDWATER USER

Plan Definitions

For the purposes of this Plan**,** the following definitions, taken from TCEQ guidance, are provided for reference:

Aesthetic water use: water use for ornamental or decorative purposes such as fountains, reflecting pools, and water gardens.

Conservation: those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water or increase the recycling and reuse of water so that a supply is conserved and made available for future or alternative uses.

Domestic water use: water use for personal needs or for household or sanitary purposes such as drinking, bathing, heating, cooking, sanitation, or for cleaning a residence, business, industry, or institution.

Landscape irrigation use: water used for the irrigation and maintenance of landscaped areas, whether publicly or privately owned, including residential and commercial lawns, gardens, golf courses, parks, rights-of-way and medians.

Non-essential water use: water uses that are not essential nor required for the protection of public, health, safety, and welfare, including:

(j) irrigation of landscape areas, including parks, athletic fields, and golf courses, except otherwise provided under this Plan;
(k) use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle;
(l) use of water to wash down any sidewalks, walkways, driveways, parking lots, tennis courts, or other hard-surfaced areas;
(m) use of water to wash down buildings or structures for purposes other than immediate fire protection;
(n) flushing gutters or permitting water to run or accumulate in any gutter or street;
(o) use of water to fill, refill, or add to any indoor or outdoor swimming pools or jacuzzi-type pools;
(p) use of water in a fountain or pond for aesthetic or scenic purposes except where necessary to support aquatic life;
(q) failure to repair a controllable leak(s) within a reasonable period after having been given notice directing the repair of such leak(s); and
(r) use of water from hydrants for construction purposes or any other purposes other than fire fighting.

RESPONSE TO A DROUGHT EVENT

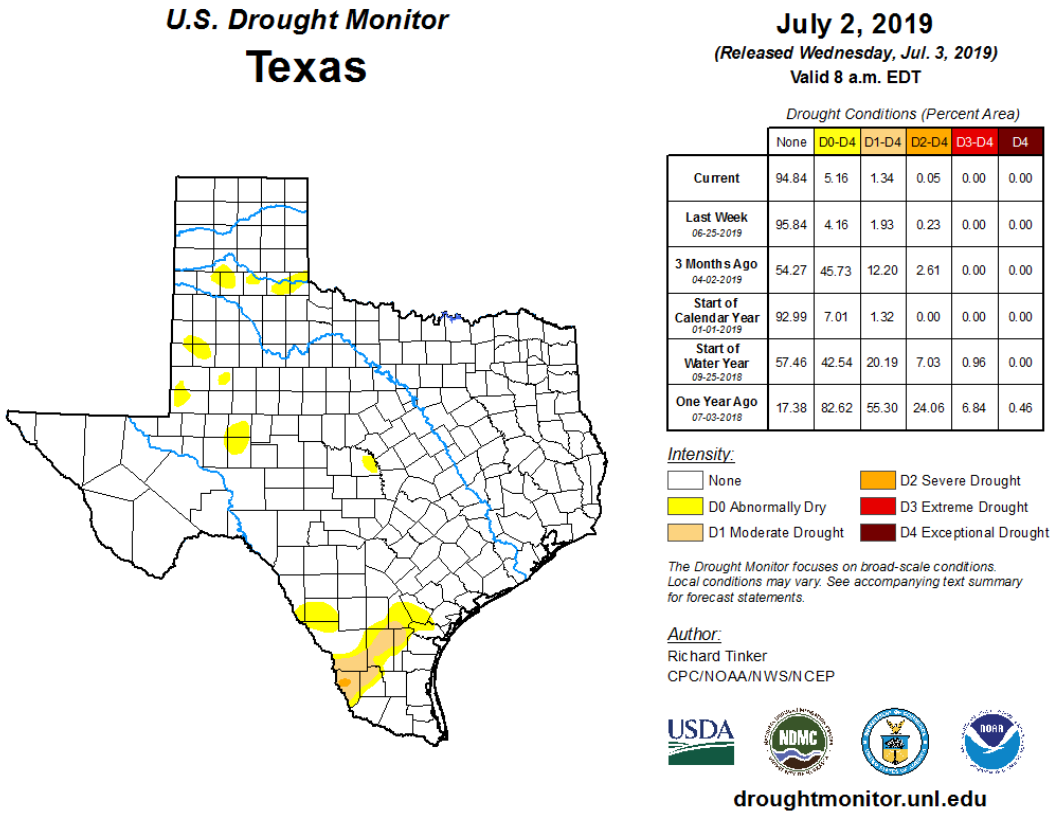
The drought contingency plan must include a minimum of three drought or emergency response stages providing for the implementation of measures in response to water supply conditions during a repeat of the drought-of-record. – 30 TAC Chapter 288

The drought contingency plan must include specific, quantified targets for water use reductions to be achieved during periods of water shortage and drought. The entity preparing the plan shall establish the targets. The goals established by the entity under this paragraph are not enforceable. – 30 TAC Chapter 288

This model DCP is intended to follow the regional recommendations for groundwater users. This recommendation is to monitor drought intensity using the U.S. Drought Monitor website. Drought intensity is updated weekly with a map of Texas shaded with the applicable drought condition.

Category	Description	Possible Impacts	Palmer Drought Index	USGS Weekly Streamflow (Percentiles)
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered	-1.0 to -1.9	21-30
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested	-2.0 to -2.9	11-20
D2	Severe Drought	Crop or pasture losses likely; water shortages common; water restrictions imposed	-3.0 to -3.9	6-10
D3	Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions	-4.0 to -4.9	3-5
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies	-5.0 or less	0-2

Go to https://droughtmonitor.unl.edu/Maps/MapArchive.aspx
Select “current” “state” and “Texas” from the drop-down menus.



Once the specific drought intensity is determined using the map, the groundwater user is encouraged to voluntarily follow the drought responses recommended by the nearest public water supplier(s) to the groundwater user.

Stage 1 – Mild Water Shortage

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive.

- Request voluntary water conservation from all customers

Stage 2 – Moderate Water Shortage

Initiation: The groundwater user will consider that a moderate water shortage exists when the local drought stage shown on the weekly Texas map is category D1 - moderate drought.

Termination: Stage 2 shall be rescinded when the local weekly drought category is D0 - abnormally dry.

Water Management Strategies: During Stage 2, we will follow the drought restrictions of local public water supplier(s).

The following are examples of strategies that are commonly used during this stage.

- Lawn watering restrictions

Stage 3 – Severe Water Shortage

Initiation: The groundwater user will consider that a moderate water shortage exists when the local drought stage shown on the weekly Texas map is category D2 - severe drought.

Termination: Stage 3 shall be rescinded when the local weekly drought category is D1 – moderate drought.

Water Management Strategies: During Stage 3, we will follow the drought restrictions of local public water supplier(s).

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive. When determining strategies, remember the type of constraint you expect on your system and plan accordingly.

- A ban on lawn watering and all other non-essential water use
- Utilize alternate or emergency water sources

Stage 4 – Emergency Water Shortage

Initiation: The groundwater user will consider that a moderate water shortage exists when the local drought stage shown on the weekly Texas map is category D3 - extreme drought.

Termination: Stage 4 shall be rescinded when the local weekly drought category is D2 – severe drought.

Water Management Strategies: During Stage 4, we will follow the drought restrictions of local public water supplier(s).

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive.

- Utilize alternative or emergency water supplies (i.e. tying into a neighboring water system, etc.
- Strategies listed in Stage 3

1.1 MODEL DROUGHT CONTINGENCY PLAN – MUNICPAL USER

General Information

Introduction

Drought is a very real natural disaster that occurs in Texas, even in the verdant bottomlands, green pastures, and piney woods of northeast Texas. As recently as 2011, drought strained water systems in the northeast Texas region. In addition to natural drought, there are also water supply emergencies that occur from time to time in which water supply becomes contaminated. A good example of this is the MTBE spill into Lake Tawakoni in May 2000, which contaminated supply for several Hunt County water systems for multiple days.

In an effort to better respond to drought conditions than we've been able to in the past, the North East Texas Regional Water Planning Group (NETRWPG) has prepared this document, with the idea that if water providers study their water supply system before a drought or emergency occurs, then they will be better prepared to respond. In preparing this document, several references were used, including Chapters 288 and 363 of the Texas Administrative Code, the Texas Commission on Environmental Quality's (TCEQ) 'Handbook for Drought Contingency Planning for Retail Public Water Suppliers,' Texas Water Code § 11.1272, and the TCEQ and TWDB websites. All of these resources are available to you if you need further information or clarification. You may also contact the TCEQ at 512-239-4691 with questions or for information. Example wording for your plan will be found throughout in bold italics.

According to the requirements set forth in the amended Chapter 288, Subchapter C of the Texas Administrative Code, retail public water suppliers providing water service to 3,300 or more connections must submit revisions to existing drought contingency plans to the executive director not later than May 1, 2009, and every five years after that date to coincide with the regional water planning group. Any new or revised plans must be submitted to the executive director within 90 days of adoption by the community water system. Any new retail public water suppliers providing water service to 3,300 or more connections shall prepare and adopt a drought contingency plan within 180 days of commencement of operation, and submit the plan to the executive director within 90 days of adoption. If you are a retail supplier, but serve less than 3,300 connections, you are still required to develop and implement a plan, but you do not need to submit the plan unless specifically requested by TCEQ. If you provide retail supply in addition to wholesale supply, you will also need to develop a retail drought contingency plan. Please see the Northeast Texas Region's guidance for retail drought contingency plans.

The _____(water provider) understands that water conservation is a viable strategy for protecting water resources both now and in the future, and that adequate planning for times of drought or emergency is a necessary part of conservation. The purpose of this plan is to prepare for the possibility of a drought or emergency situation where water is in short supply. This plan will help to ensure that _____(water supplier) and its wholesale customers use water wisely and efficiently during periods of drought.

Though not specifically required by rule, it is helpful to the reader if you summarize your water supply and distribution systems in the introduction. This will familiarize users of the Plan with your system, and help them to make sense of the actions that you intend to take. In addition, discussing your water system here will assist those who update the plan in five years, because they will know exactly what the system looked like when the plan was created.

The _____(water supplier) utilizes groundwater /surface water from _____(source). Supply is secured by a (water right, water supply contract, etc.) through the year _____. Our customers include _____, and their current contracted amounts are _____. Our storage and distribution systems consist of _____.

Coordination with the North East Texas Regional Water Planning Group

The drought contingency plan must document coordination with the regional water planning groups for the service area of the wholesale public water supplier to ensure consistency with the appropriate approved regional water plans. – 30 TAC Chapter 288

A copy of this adopted plan will be submitted to the NETRWPG via its administrator, Mr. Walt Sears, Northeast Texas Municipal Water District, P. O. Box 955, Hughes Springs, Texas 75656. Proof of submittal is attached hereto as Figure ___.

Informing the Public/Requesting Input

According to 30 TAC Chapter 288, Subchapter B.a.1, "Preparation of the plan shall include provisions to actively inform the public and to affirmatively provide opportunity for user input in the preparation of the plan and for informing wholesale customers about the plan. Such acts may include, but are not limited to, having a public meeting at a time and location convenient to the public and providing written notice to the public concerning the proposed plan and meeting."

The _____(water supplier) gave the public and its wholesale customers an opportunity to provide input into this plan by _____(public notice, public hearing, letter requesting comments, etc.). Public comments included _____.

Efforts to inform wholesale customers and the public about each stage of the plan, and when stages are implemented or rescinded, will be through _____ (certified letter, newspaper articles, radio announcements, website announcements, etc.).

Authorization/Applicability

The _____ (mayor, president, city administrator, etc.) is hereby authorized to monitor weather conditions as well as water supply and demand conditions and to implement the Drought Contingency Plan as appropriate.

The _____(City Council, Board of Directors, etc.) authorizes the Plan by a _____(resolution, ordinance), which has been included in this Plan.

Coordination with the Texas Commission on Environmental Quality

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According to 30 TAC Chapter 288, Subchapter C, "Wholesale public water suppliers shall submit a drought contingency plan meeting the requirements of Subchapter B of this chapter to the executive director not later than May 1, 2005, after adoption of the drought contingency plan by the governing body of the water supplier. Thereafter, the wholesale public water suppliers shall submit the next revision of the plan not later than May 1, 2009, and every five years after that date to coincide with the regional water planning group. Any new or revised plans must be submitted to the executive director within 90 days of adoption by the governing body of the wholesale public water supplier."

This plan was submitted to the executive director of the Texas Commission of Environmental Quality on _____(date).

Send your plan to the following address: TCEQ, Resource Protection Team, Mail Code 160, P.O. Box 13087, Austin, TX 78711-3087 for regular and certified mail, or 12100 Park 35 Circle, Austin, TX 78753 for express carrier deliveries (U.S. Post Office Express Mail, FedEx, UPS, etc.).

For questions to the TCEQ, see the website at www.tceq.state.tx.us, or call: 512/239-4691.

Coordination with Wholesale Water Supplier

This section only applies if you purchase supply from a wholesale provider. If you have a contract or agreement with a water provider, then complete this section. If you have your own water rights or otherwise own your supply, this section does not apply.

This plan has been created with our water provider, _____'s drought contingency plan in mind. We have included _____'s (water provider) requirements within our plan and have created this plan to compliment _____'s (water provider) plan. _____(water provider) has been provided a copy of this plan.

Plan Definitions

For the purposes of this Plan**,** the following definitions, taken from TCEQ guidance, shall apply:

Aesthetic water use: water use for ornamental or decorative purposes such as fountains, reflecting pools, and water gardens.

Commercial and institutional water use: water use which is integral to the operations of commercial and non-profit establishments and governmental entities such as retail establishments, hotels and motels, restaurants, and office buildings.

Conservation: those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water or increase the recycling and reuse of water so that a supply is conserved and made available for future or alternative uses.

Customer: any person, company, or organization using water supplied by _____ (name of water supplier).

Domestic water use: water use for personal needs or for household or sanitary purposes such as drinking, bathing, heating, cooking, sanitation, or for cleaning a residence, business, industry, or institution.

Even number address: street addresses, box numbers, or rural postal route numbers ending in 0, 2, 4, 6, or 8 and locations without addresses.

Industrial water use: the use of water in processes designed to convert materials of lower value into forms having greater usability and value.

Landscape irrigation use: water used for the irrigation and maintenance of landscaped areas, whether publicly or privately owned, including residential and commercial lawns, gardens, golf courses, parks, rights-of-way and medians.

Non-essential water use: water uses that are not essential nor required for the protection of public, health, safety, and welfare, including:

(a) irrigation of landscape areas, including parks, athletic fields, and golf courses, except otherwise provided under this Plan;
(b) use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle;
(c) use of water to wash down any sidewalks, walkways, driveways, parking lots, tennis courts, or other hard-surfaced areas;
(d) use of water to wash down buildings or structures for purposes other than immediate fire protection;
(e) flushing gutters or permitting water to run or accumulate in any gutter or street;

(f) use of water to fill, refill, or add to any indoor or outdoor swimming pools or jacuzzi-type pools;
(g) use of water in a fountain or pond for aesthetic or scenic purposes except where necessary to support aquatic life;
(h) failure to repair a controllable leak(s) within a reasonable period after having been given notice directing the repair of such leak(s); and
(i) use of water from hydrants for construction purposes or any other purposes other than fire fighting.

Odd numbered address: street addresses, box numbers, or rural postal route numbers ending in 1, 3, 5, 7, or 9.

RESPONSE TO A DROUGHT EVENT

In this portion of the plan, it will need to be determined whether a water constraint will more likely be caused by a shortage in water supply or by constraints in the storage and distribution system. Associated goals and water management measures should correspond to the type of constraint expected. For example, if insufficient storage is determined to be the most likely cause of water shortage during a drought, then an emergency back-up supply source would not solve the problem; reduced use during peak hours (banning lawn watering, etc.) would more likely solve the problem by giving storage tanks a better opportunity to refill.

The drought contingency plan should be designed for a drought condition at least as severe as the drought of record according to TCEQ rules. Since the drought of record in Texas occurred in the 1950's, few systems will have water use records still available to plan by. Therefore, the NETRWPG suggests using the most recent drought for the State, which occurred in 2011. If your system does not have records for 2011, use the time period in your records when your system was the most strained by dry weather conditions.

The drought contingency plan must include a minimum of three drought or emergency response stages providing for the implementation of measures in response to water supply conditions during a repeat of the drought-of-record. – 30 TAC Chapter 288

The drought contingency plan must include specific, quantified targets for water use reductions to be achieved during periods of water shortage and drought. The entity preparing the plan shall establish the targets. The goals established by the entity under this paragraph are not enforceable. – 30 TAC Chapter 288

A minimum of three drought stages is required in this plan. During each stage, it will need to be determined what will trigger initiation, what the water use reduction target goal is, what water management strategies will be put into place, and, finally, what will terminate the stage. Keep in mind that a supplier who is also a customer of its wholesale provider must comply with its provider's Drought Contingency Plan. Do not develop stages or management strategies that are in conflict with your water provider's DCP. Also note that the NETRWPG has developed water

management strategies for all providers who are projected to have a water shortage within the planning period (50 years). You should review the latest version of the Regional Water Plan to determine if you have had strategies prepared for you.

Include an opening paragraph in this section that describes what information should be monitored in order to initiate the stages, and a rationale of why you chose the triggering criteria that you chose.

The drought contingency plan must include a provision in every wholesale water contract entered into or renewed after adoption of the plan, including contract extensions, that in case of a shortage of water resulting from drought, the water to be distributed shall be divided in accordance with Texas Water Code, §11.039. – 30 TAC Chapter 288

Texas Water Code, §11.039 states, "DISTRIBUTION OF WATER DURING SHORTAGE. (a) If a shortage of water in a water supply not covered by a water conservation plan prepared in compliance with Texas Natural Resource Conservation Commission or Texas Water Development Board rules results from drought, accident, or other cause, the water to be distributed shall be divided among all customers pro rata, according to the amount each may be entitled to, so that preference is given to no one and everyone suffers alike. (b) If a shortage of water in a water supply covered by a water conservation plan prepared in compliance with Texas Natural Resource Conservation Commission or Texas Water Development Board rules results from drought, accident, or other cause, the person, association of persons, or corporation owning or controlling the water shall divide the water to be distributed among all customers pro rata, according to: (1) the amount of water to which each customer may be entitled; or (2) the amount of water to which each customer may be entitled, less the amount of water the customer would have saved if the customer had operated its water system in compliance with the water conservation plan.(c) Nothing in Subsection (a) or (b) precludes the person, association of persons, or corporation owning or controlling the water from supplying water to a person who has a prior vested right to the water under the laws of this state.

Stage 1 – Mild Water Shortage

Initiation: The _____(name of water supplier) will consider that a mild water shortage exists when_____ (i.e. water levels in the reservoir reach_____; average daily water use reaches ___% of capacity for three consecutive days; water level in elevated storage tank is at or below ____ for more than 12 hours, etc.)***, or when requested by _____*** (entity's water provider) if applicable**.**

Target Goal: When a mild water shortage exists, the _____(water supplier) will implement water management strategies in an attempt to reduce daily water use to _____ (i.e. 2 MGD; ___% of average daily water use, etc.) Please note that this goal must be quantifiable. Goals established in this section are not enforceable.

Termination: Stage 1 shall be rescinded when _____ (i.e. water levels in the reservoir rise above ___ for 7 consecutive days; average daily water use falls below ___% of capacity for three consecutive days; storage facilities return to normal levels for 24 consecutive hours, etc.)***, or when Stage I is rescinded by _____*** (entity's water provider) if applicable***.***

Water Management Strategies: During Stage 1, we will take the following steps to reduce water use:_____.

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive. When determining strategies, remember the type of constraint you expect on your system and plan accordingly.

The drought contingency plan must include the specific water supply or water demand management measures to be implemented during each stage of the plan including, but not limited to, the following: (A) pro rata curtailment of water deliveries to or diversions by wholesale water customers as provided in Texas Water Code, §11.039; and (B) utilization of alternative water sources with the prior approval of the executive director as appropriate, e.g. interconnection with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.). – 30 TAC Chapter 288

- Request voluntary water conservation from all customers
- Recommend that customers initiate Stage 1 of their Drought Contingency Plans
- Reduce operating procedures that use water (i.e. flushing of mains) as appropriate

<u>Stage 2 – Moderate Water Shortage</u>

Initiation: The _____(water supplier) will consider that a moderate water shortage exists when_____(i.e. water levels in the reservoir reach_____; average daily water use reaches ___% of capacity for three consecutive days; water level in elevated storage tank is at or below ____ for more than 12 hours, etc.)***, or when requested by _____ (entity's water provider)*** if applicable.

Target Goal: When a moderate water shortage exists, the _____(water supplier) will implement water management strategies in an attempt to reduce daily water use to _____ (i.e. 2 MGD; ___% of average daily water use, etc.) Please note that this goal must be quantifiable. Goals established in this section are not enforceable.

Termination: Stage 2 shall be rescinded when _____ (i.e. water levels in the reservoir rise above ___ for 7 consecutive days; average daily water use falls below ___% of capacity for three consecutive days; storage facilities return to normal levels for 24 consecutive hours, etc.)***, or when Stage 2 is rescinded by***

_____ (entity's water provider) if applicable. ***Upon termination of Stage 2, Stage 1 becomes operative.***

Water Management Strategies: During Stage 2, we will take the following steps to reduce water use:_____.

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive. When determining strategies, remember the type of constraint you expect on your system and plan accordingly.

The drought contingency plan must include the specific water supply or water demand management measures to be implemented during each stage of the plan including, but not limited to, the following: (A) pro rata curtailment of water deliveries to or diversions by wholesale water customers as provided in Texas Water Code, §11.039; and (B) utilization of alternative water sources with the prior approval of the executive director as appropriate, e.g. interconnection with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.). – 30 TAC Chapter 288

- Recommend that customers initiate Stage 2 of their Drought Contingency Plans, which should, at a minimum, contain lawn watering restrictions
- Modify reservoir operations if applicable
- Initiate strong public awareness campaign in service area to warn of impending shortages

Stage 3 – Severe Water Shortage

Initiation: The _____(water supplier) will consider that a severe water shortage exists when_____(i.e. water levels in the reservoir reach_____; average daily water use reaches ___% of capacity for three consecutive days; water level in elevated storage tank is at or below ____ for more than 12 hours, etc.)***, or when requested by _____*** (entity's water provider) if applicable**.**

Target Goal: When a severe water shortage exists, the _____(water supplier) will implement water management strategies in an attempt to reduce daily water use to _____ (i.e. 2 MGD; ___% of average daily water use, etc.) Please note that this goal must be quantifiable. Goals established in this section are not enforceable.

Termination: Stage 3 shall be rescinded when _____ (i.e. water levels in the reservoir rise above ___ for 7 consecutive days; average daily water use falls below ___% of capacity for three consecutive days; storage facilities return to normal levels for 24 consecutive hours, etc.)***, or when Stage 3 is rescinded by _____*** (entity's water provider) if applicable**. Upon termination of Stage 3, Stage 2 becomes operative.***

Water Management Strategies: During Stage 3, we will take the following steps to reduce water use:_____.

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive. When determining strategies, remember the type of constraint you expect on your system and plan accordingly.

The drought contingency plan must include the specific water supply or water demand management measures to be implemented during each stage of the plan including, but not limited to, the following: (A) pro rata curtailment of water deliveries to or diversions by wholesale water customers as provided in Texas Water Code, §11.039; and (B) utilization of alternative water sources with the prior approval of the executive director as appropriate, e.g. interconnection with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.). – 30 TAC Chapter 288

- Recommend that customers initiate Stage 3 of their Drought Contingency Plans, which, at a minimum, must include a ban on lawn watering
- Begin pro rata water allocation (Pro rata curtailment of water deliveries to or diversions by wholesale water customers must be considered in a wholesale DCP according to 30 TAC Chapter 288, Subchapter B. Rules for pro rata curtailment are provided in Texas Water Code, §11.039.)
- Implement water rate surcharges (i.e. a set charge for any use above average monthly use)
- Implement price adjustments (i.e. increase the price per 1,000 gallons of water used above the average monthly use)
- Utilize alternate or emergency water sources

Stage 4 – Emergency Water Shortage

This Stage could apply in the instance of a major water line break, a contamination of the water supply source, or other urgent water system conditions. Most likely, this stage would be initiated by decision of the authorized plan implementer (Mayor, President, Manager, etc.)

Initiation: The _____(water supplier) will consider that an emergency water shortage exists when_____ (i.e. the water main at the water treatment plant bursts or is otherwise significantly damaged; the reservoir is contaminated by oil spill; etc.,)***, or when requested by _____*** (entity's water provider) if applicable.

Target Goal: When an emergency water shortage exists, the _____(water supplier) will implement water management strategies in an attempt to reduce daily water use to _____ (i.e. 2 MGD; ___% of average daily water use, etc.) Please note that this goal must be quantifiable. Goals established in this section are not enforceable.

Termination: Stage 4 shall be rescinded when _____ (i.e. the main at the water treatment plant is restored and storage tanks have been allowed to refill; analysis of the source water indicates that supply is safe to use; etc.), ***or when Stage 4 is rescinded by _____***(entity's water provider) if applicable.

Water Management Strategies: During Stage 4, we will take the following steps to reduce water use:_____.

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive. When determining strategies, remember the type of constraint you expect on your system and plan accordingly.

The drought contingency plan must include the specific water supply or water demand management measures to be implemented during each stage of the plan including, but not limited to, the following: (A) pro rata curtailment of water deliveries to or diversions by wholesale water customers as provided in Texas Water Code, §11.039; and (B) utilization of alternative water sources with the prior approval of the executive director as appropriate, e.g. interconnection with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.). – 30 TAC Chapter 288

- Utilize alternative or emergency water supplies (i.e. tying into a neighboring water system, etc. This may require approval by the TCEQ Executive Director)
- Modify reservoir operations
- Strategies listed in Stage 3

PLAN EXECUTION

Public Involvement

This section should discuss the ways in which the supplier will inform its wholesale customers about the initiation and termination of drought stages, as well as management strategies that customers are expected to follow. Public involvement can be in the form of special public hearings, articles and notices in the local newspaper, radio announcements, announcements on local television stations, notices in billing statements, etc.

The _____ (water provider) will keep its customers apprised of initiation of the drought contingency plan, and changes in stages, by means of _____.

Enforcement

The _____ (Mayor, City Manager, President, etc.), or his/her designee, is responsible for monitoring weather conditions and water supplies, and determining when to initiate and terminate stages of the DCP.

The drought contingency plan must include procedures for the enforcement of any mandatory water use restrictions including specification of penalties (e.g., liquidated damages, water rate surcharges, discontinuation of service) for violations of such restrictions. – 30 TAC Chapter 288, Subchapter B.a.10.

The _____ (governing body) has adopted this plan through _____ (ordinance, resolution), and has made it an official _____ (city, Corporation, etc.) policy. The _____ (ordinance, resolution, etc.) is attached hereto as Figure ___.

Provision for responding to wholesale provider restrictions

Any water supplier that receives all or a portion of its water supply from another water supplier shall consult with that supplier and shall include in the drought contingency plan appropriate provisions for responding to reductions in that water supply. – 30 TAC Chapter 288

If you have a wholesale provider, then add this section. If you own your own supply, please skip this section.

As stated in each water shortage stage, we intend to comply with all requirements of our wholesale provider's drought contingency plan. This plan is as stringent as our provider's plan, and in some cases may be more so.

Notification of TCEQ on mandatory provisions

A wholesale or retail water supplier shall notify the executive director within five business days of the implementation of any mandatory provisions of the drought contingency plan. – 30 TAC Chapter 288

The Executive Director at TCEQ shall be notified with 5 business days if any mandatory provisions of this plan are implemented. The Executive Director can be reached at 512-239-3900.

Variance procedures

The drought contingency plan must include procedures for granting variances to the plan. – 30 TAC Chapter 288

The _____ (authorized representative) may, in writing, grant temporary variance for existing water uses otherwise prohibited under this Plan if it is determined that failure to grant such variance would cause an emergency condition adversely affecting the health, sanitation, or fire protection for the public or the customer requesting such variance and if one or more of the following conditions are met:

(a) Compliance with this Plan cannot be technically accomplished during the duration of the water supply shortage or other condition for which the Plan is in effect.

(b) Alternative methods can be implemented which will achieve the same level of reduction in water use.

Customers requesting an exemption from the provisions of this Plan shall file a petition for variance with the _____ (water supplier) within 5 days after the Plan or a particular drought response stage has been invoked. All petitions for variances shall be reviewed by the _____ (authorized representative), and shall include the following:

(a) Name and address of the petitioner(s).
(b) Purpose of water use.
(c) Specific provision(s) of the Plan from which the petitioner is requesting relief.
(d) Detailed statement as to how the specific provision of the Plan adversely affects the petitioner or what damage or harm will occur to the petitioner or others if petitioner complies with this Ordinance.
(e) Description of the relief requested.
(f) Period of time for which the variance is sought.
(g) Alternative water use restrictions or other measures the petitioner is taking or proposes to take to meet the intent of this Plan and the compliance date.
(h) Other pertinent information.

Variances granted by the _____ (water supplier) shall be subject to the following conditions, unless waived or modified:

(a) Variances granted shall include a timetable for compliance.
(b) Variances granted shall expire when the Plan is no longer in effect, unless the petitioner has failed to meet specified requirements.

No variance shall be retroactive or otherwise justify any violation of this Plan occurring prior to the issuance of the variance.

5-year updates

The retail public water supplier shall review and update, as appropriate, the drought contingency plan, at least every five years, based on new or updated information, such as the adoption or revision of the regional water plan. – 30 TAC Chapter 288

This plan shall be re-evaluated and updated every five years based on updated information; especially the latest adopted NETRWPG Regional Water Plan.

1.2 MODEL DROUGHT CONTINGENCY PLAN – INDUSTRIAL USER (MANUFACTURING AND STEAM ELECTRIC POWER)

RESPONSE TO A DROUGHT EVENT

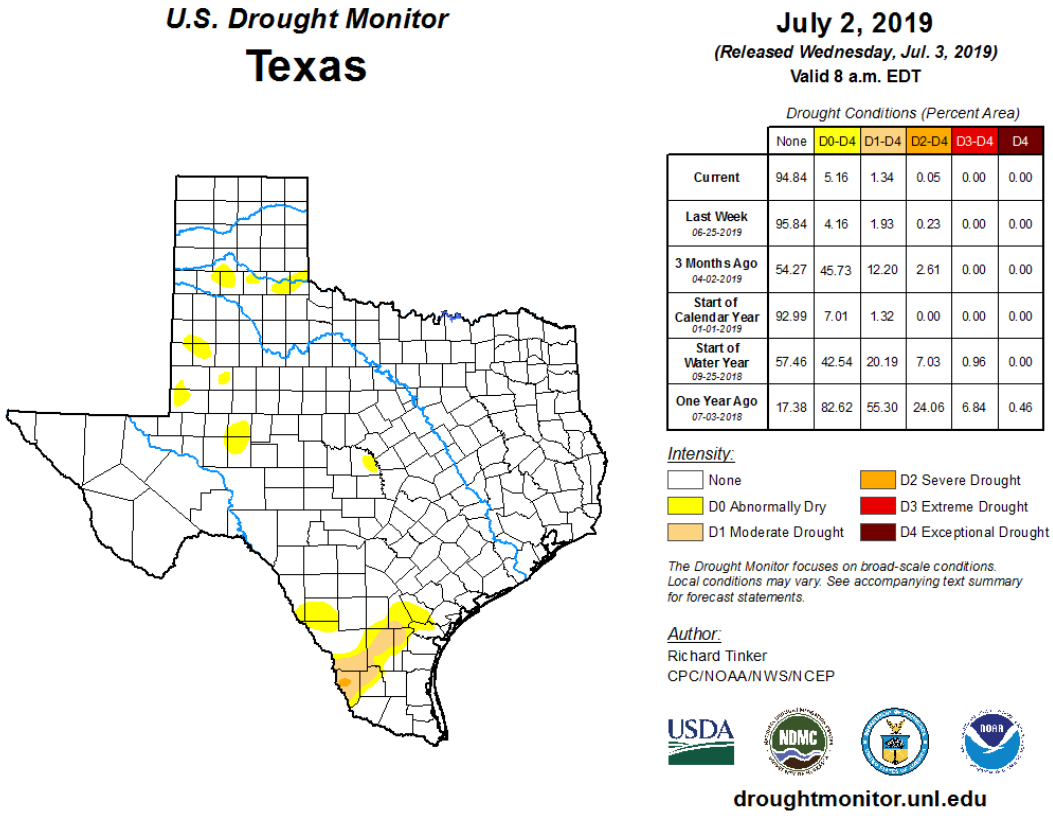
The drought contingency plan must include a minimum of three drought or emergency response stages providing for the implementation of measures in response to water supply conditions during a repeat of the drought-of-record. – 30 TAC Chapter 288

The drought contingency plan must include specific, quantified targets for water use reductions to be achieved during periods of water shortage and drought. The entity preparing the plan shall establish the targets. The goals established by the entity under this paragraph are not enforceable. – 30 TAC Chapter 288

This model DCP is intended to follow the regional recommendations for industrial users, which includes manufacturing and steam electric power. This recommendation is to monitor drought intensity using the U.S. Drought Monitor website. Drought intensity is updated weekly with a map of Texas shaded with the applicable drought condition.

Category	Description	Possible Impacts	Palmer Drought Index	USGS Weekly Streamflow (Percentiles)
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered	-1.0 to -1.9	21-30
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested	-2.0 to -2.9	11-20
D2	Severe Drought	Crop or pasture losses likely; water shortages common; water restrictions imposed	-3.0 to -3.9	6-10
D3	Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions	-4.0 to -4.9	3-5
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies	-5.0 or less	0-2

Go to https://droughtmonitor.unl.edu/Maps/MapArchive.aspx
Select “current” “state” and “Texas” from the drop-down menus.



Once the specific drought intensity is determined using the map, the industrial user is encouraged to voluntarily follow the drought responses recommended by the nearest public water supplier(s) or this plan.

<u>Stage 1 – Mild Water Shortage</u>

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive.

- Request voluntary water conservation from all customers

<u>Stage 2 – Moderate Water Shortage</u>

Initiation: The groundwater user will consider that a moderate water shortage exists when the local drought stage shown on the weekly Texas map is category D1 - moderate drought.

Termination: Stage 2 shall be rescinded when the local weekly drought category is D0 - abnormally dry.

Water Management Strategies: During Stage 2, we will follow the drought restrictions of local public water supplier(s).

The following are examples of strategies that are commonly used during this stage.

- Request ten percent water conservation

Stage 3 – Severe Water Shortage

Initiation: The groundwater user will consider that a moderate water shortage exists when the local drought stage shown on the weekly Texas map is category D2 - severe drought.

Termination: Stage 3 shall be rescinded when the local weekly drought category is D1 – moderate drought.

Water Management Strategies: During Stage 3, we will follow the drought restrictions of local public water supplier(s).

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive. When determining strategies, remember the type of constraint you expect on your system and plan accordingly.

- Request twenty percent water conservation
- Utilize alternate or emergency water sources

Stage 4 – Emergency Water Shortage

Initiation: The groundwater user will consider that a moderate water shortage exists when the local drought stage shown on the weekly Texas map is category D3 - extreme drought.

Termination: Stage 4 shall be rescinded when the local weekly drought category is D2 – severe drought.

Water Management Strategies: During Stage 4, we will follow the drought restrictions of local public water supplier(s).

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive.

- Request thirty percent water conservation
- Utilize alternative or emergency water supplies (i.e. tying into a neighboring water system, etc.

The following worksheet content is from TCEQ industrial conservation plan guidance, and is included For guidance.

WATER USE AND CONSERVATION PRACTICES

Water Use in Industrial Processes

Production Use	*% Groundwater*	*% Surface Water*	*% Saline Water*	*% Treated Water*	*Water Use (in acre-ft)*
Cooling, condensing, & refrigeration					
Processing, washing, transport					
Boiler feed					
Incorporated into product					
Other					

Facility Use	*% Groundwater*	*% Surface Water*	*% Saline Water*	*% Treated Water*	*Water Use (in acre-ft)*
Cooling tower(s)					
Pond(s)					
Once through					
Sanitary & drinking water					
Irrigation & dust control					

1. Was fresh water recirculated at this facility? ☐ Yes ☐ No

2. Provide a detailed description of how the water will be utilized in the industrial process.

3. Estimate the quantity of water consumed in production processes and is therefore unavailable for reuse, discharge, or other means of disposal.

4. Monthly water consumption for previous year (in acre-feet).

Month	*Diversion Amount*	*% of Water Returned (If Any)*	*Monthly Consumption*
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			
Totals			

5. Projected monthly water consumption for next year (in acre-feet).

Month	*Diversion Amount*	*% of Water Returned (If Any)*	*Monthly Consumption*
January			
February			
March			
April			
May			
June			

July			
August			
September			
October			
November			
December			
Totals			

Specific and Quantified Conservation Goal

Water conservation goals for the industrial sector are generally established either for (1) the amount of water recycled, (2) the amount of water reused, or (3) the amount of water not lost or consumed, and therefore is available for return flow.

6. Water conservation goal (water use efficiency measure)

   Type of goal(s):
   - % reused water
   - % of water not consumed and therefore returned
   - Other (specify)

7. Provide specific, quantified 5-year and 10-year targets for water savings and the basis for development of such goals for this water use/facility.

   Quantified 5-year and 10-year targets for water savings:

   a. 5-year goal:

   b. 10-year goal:

8. Describe the device(s) and/or method(s) used to measure and account for the amount of water diverted from the supply source, and verify the accuracy is within plus or minus 5%.

9. Provide a description of the leak-detection and repair, and water-loss accounting measures used.

10. Describe the application of state-of-the-art equipment and/or process modifications used to improve water use efficiency.

11. Describe any other water conservation practice, method, or technique which the user shows to be appropriate for achieving the stated goal or goals of the water conservation plan:

1.2 MODEL DROUGHT CONTINGENCY PLAN – INDUSTRIAL USER (MANUFACTURING AND STEAM ELECTRIC POWER)

RESPONSE TO A DROUGHT EVENT

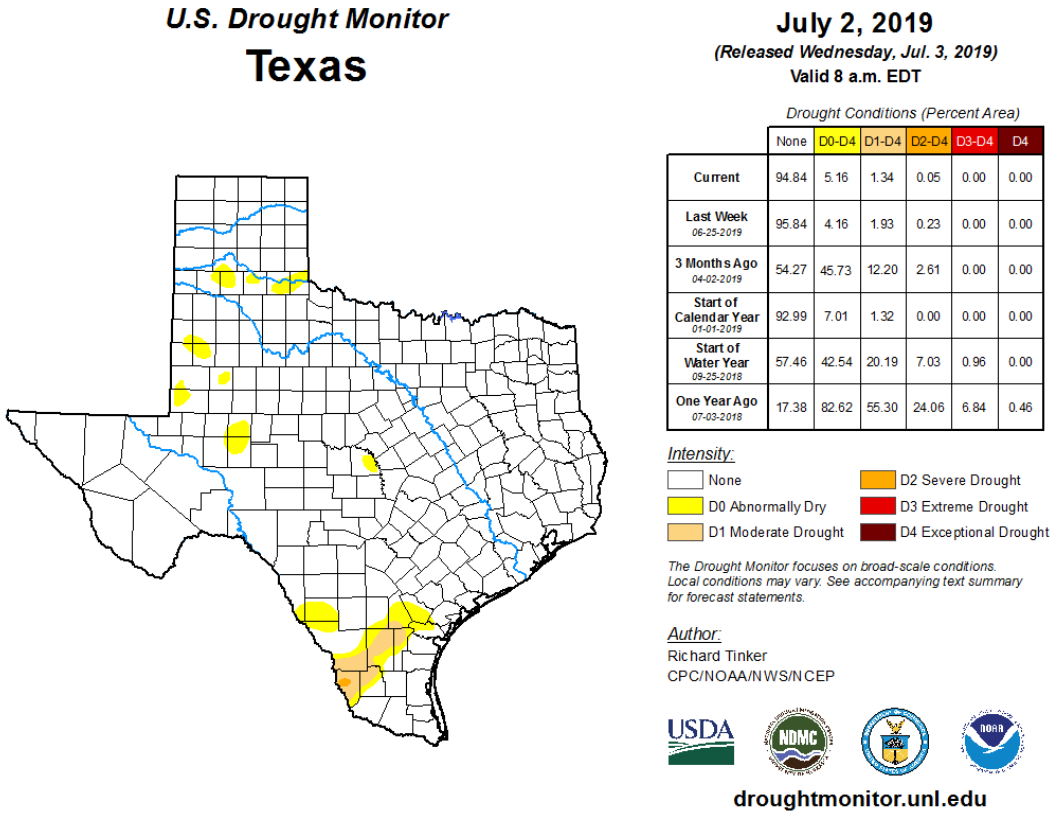
The drought contingency plan must include a minimum of three drought or emergency response stages providing for the implementation of measures in response to water supply conditions during a repeat of the drought-of-record. – 30 TAC Chapter 288

The drought contingency plan must include specific, quantified targets for water use reductions to be achieved during periods of water shortage and drought. The entity preparing the plan shall establish the targets. The goals established by the entity under this paragraph are not enforceable. – 30 TAC Chapter 288

This model DCP is intended to follow the regional recommendations for industrial users, which includes manufacturing and steam electric power. This recommendation is to monitor drought intensity using the U.S. Drought Monitor website. Drought intensity is updated weekly with a map of Texas shaded with the applicable drought condition.

Category	Description	Possible Impacts	Palmer Drought Index	USGS Weekly Streamflow (Percentiles)
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered	-1.0 to -1.9	21-30
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested	-2.0 to -2.9	11-20
D2	Severe Drought	Crop or pasture losses likely; water shortages common; water restrictions imposed	-3.0 to -3.9	6-10
D3	Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions	-4.0 to -4.9	3-5
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies	-5.0 or less	0-2

Go to https://droughtmonitor.unl.edu/Maps/MapArchive.aspx
Select “current” “state” and “Texas” from the drop-down menus.



Once the specific drought intensity is determined using the map, the industrial user is encouraged to voluntarily follow the drought responses recommended by the nearest public water supplier(s) or this plan.

Stage 1 – Mild Water Shortage

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive.

- Request voluntary water conservation from all customers

Stage 2 – Moderate Water Shortage

Initiation: The groundwater user will consider that a moderate water shortage exists when the local drought stage shown on the weekly Texas map is category D1 - moderate drought.

Termination: Stage 2 shall be rescinded when the local weekly drought category is D0 - abnormally dry.

Water Management Strategies: During Stage 2, we will follow the drought restrictions of local public water supplier(s).

The following are examples of strategies that are commonly used during this stage.

- Request ten percent water conservation

Stage 3 – Severe Water Shortage

Initiation: The groundwater user will consider that a moderate water shortage exists when the local drought stage shown on the weekly Texas map is category D2 - severe drought.

Termination: Stage 3 shall be rescinded when the local weekly drought category is D1 – moderate drought.

Water Management Strategies: During Stage 3, we will follow the drought restrictions of local public water supplier(s).

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive. When determining strategies, remember the type of constraint you expect on your system and plan accordingly.

- Request twenty percent water conservation
- Utilize alternate or emergency water sources

Stage 4 – Emergency Water Shortage

Initiation: The groundwater user will consider that a moderate water shortage exists when the local drought stage shown on the weekly Texas map is category D3 - extreme drought.

Termination: Stage 4 shall be rescinded when the local weekly drought category is D2 – severe drought.

Water Management Strategies: During Stage 4, we will follow the drought restrictions of local public water supplier(s).

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive.

- Request thirty percent water conservation
- Utilize alternative or emergency water supplies (i.e. tying into a neighboring water system, etc.

The following worksheet content is from TCEQ industrial conservation plan guidance, and is included For guidance.

WATER USE AND CONSERVATION PRACTICES

Water Use in Industrial Processes

Production Use	*% Groundwater*	*% Surface Water*	*% Saline Water*	*% Treated Water*	*Water Use (in acre-ft)*
Cooling, condensing, & refrigeration					
Processing, washing, transport					
Boiler feed					
Incorporated into product					
Other					

Facility Use	*% Groundwater*	*% Surface Water*	*% Saline Water*	*% Treated Water*	*Water Use (in acre-ft)*
Cooling tower(s)					
Pond(s)					
Once through					
Sanitary & drinking water					
Irrigation & dust control					

1. Was fresh water recirculated at this facility? ☐ Yes ☐ No

2. Provide a detailed description of how the water will be utilized in the industrial process.

3. Estimate the quantity of water consumed in production processes and is therefore unavailable for reuse, discharge, or other means of disposal.

4. Monthly water consumption for previous year (in acre-feet).

Month	*Diversion Amount*	*% of Water Returned (If Any)*	*Monthly Consumption*
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			
Totals			

5. Projected monthly water consumption for next year (in acre-feet).

Month	*Diversion Amount*	*% of Water Returned (If Any)*	*Monthly Consumption*
January			
February			
March			
April			
May			
June			

July			
August			
September			
October			
November			
December			
Totals			

Specific and Quantified Conservation Goal

Water conservation goals for the industrial sector are generally established either for (1) the amount of water recycled, (2) the amount of water reused, or (3) the amount of water not lost or consumed, and therefore is available for return flow.

6. Water conservation goal (water use efficiency measure)

   Type of goal(s):
   - % reused water
   - % of water not consumed and therefore returned
   - Other (specify)

7. Provide specific, quantified 5-year and 10-year targets for water savings and the basis for development of such goals for this water use/facility.

   Quantified 5-year and 10-year targets for water savings:

   a. 5-year goal:

   b. 10-year goal:

8. Describe the device(s) and/or method(s) used to measure and account for the amount of water diverted from the supply source, and verify the accuracy is within plus or minus 5%.

9. Provide a description of the leak-detection and repair, and water-loss accounting measures used.

10. Describe the application of state-of-the-art equipment and/or process modifications used to improve water use efficiency.

11. Describe any other water conservation practice, method, or technique which the user shows to be appropriate for achieving the stated goal or goals of the water conservation plan: