

WATER CONSERVATION AND DROUGHT CONTINGENCY PLAN

REVISED MAY 2009

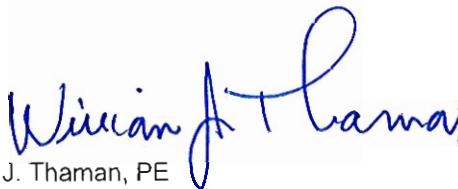
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Water Conservation and Drought Contingency Plan

Sabine River Authority of Texas

Prepared by

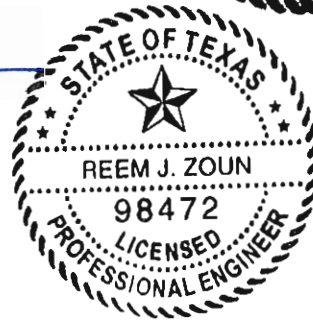
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Contents

Section 1 – Introduction	1
1.1 Sabine River Authority	1
1.2 Purpose for Water Conservation	2
1.3 Report Organization.....	4
Section 2 – Service Area and System Evaluation.....	6
2.1 Water Supply and Wastewater System	6
2.2 SRA Service Area Population, Historical and Projected Use	7
Section 3 – Conservation Practices for a Regional Wholesale Supplier	16
3.1 Targets for Water Savings	16
3.1.1 Target Goals for Municipal Use in Gallons Per Capita Per Day.....	16
3.1.2 Target Goals for Maximum Acceptable Unaccounted-for Water.....	18
3.2 Practices and Devices to Measure Water Diverted.....	18
3.3 Monitoring and Record Management Program	18
3.4 Leak Detection and Repair	19
3.5 Conservation and Drought Contingency Stipulations of Water Sales Contracts	19
3.6 Reservoir Systems Operations Plans	19
3.7 Implementation and Enforcement of Plan	20
3.8 Coordination with the Regional Water Planning Groups (RWPG)	20
3.9 Additional Water Conservation Strategies.....	20
3.9.1 Education and Information Program.....	20
3.9.2 Technical Assistance in Development of Conservation Plans	21
3.9.3 Recycling and Reuse Programs	22
3.9.4 Best Management Practices (BMPs).....	22
3.9.5 Community Assistance Program	22
3.10 Review and Update Schedule	22
Section 4 – Drought Contingency Plan.....	23
4.1 Declaration of Policy, Purpose, and Intent	23
4.2 Public Involvement.....	23
4.3 Wholesale Water Customer Education.....	23
4.4 Coordination with Regional Water Planning Groups (RWPG)	23
4.5 Authorization.....	24
4.6 Application	24
4.7 Criteria and Actions Required for Drought Response Stages for Iron Bridge and Lake Fork Divisions	24

4.7.1	Stage 1 – Mild Water Shortage Conditions	25
4.7.1.1	Requirement for initiation	25
4.7.1.2	Requirements for termination	25
4.7.1.3	Goal	26
4.7.1.4	Measures.....	26
4.7.2	Stage 2 – Moderate Water Shortage Conditions.....	26
4.7.2.1	Requirement for initiation	26
4.7.2.2	Requirements for termination	26
4.7.2.3	Goal	27
4.7.2.4	Measures.....	27
4.7.3	Stage 3 – Severe Water Shortage Conditions	27
4.7.3.1	Requirements for initiation.....	27
4.7.3.2	Requirements for termination	27
4.7.3.3	Goal	27
4.7.3.4	Measures.....	27
4.7.4	Stage 4 - Critical Water Shortage Conditions.....	28
4.7.4.1	Requirements for initiation.....	28
4.7.4.2	Requirements for termination	28
4.7.4.3	Goal	28
4.7.4.4	Measures.....	28
4.7.5	Stage 5 – Emergency Water Shortage Conditions (related to drought).....	29
4.7.5.1	Requirements for initiation.....	29
4.7.5.2	Requirements for termination	29
4.7.5.3	Goal	29
4.7.5.4	Measures.....	29
4.7.6	Emergency Water Shortage Conditions (not related to drought)	30
4.7.6.1	Requirements for initiation.....	30
4.7.6.2	Requirements for termination	30
4.7.6.3	Goal	30
4.7.6.4	Measures.....	30
4.8	Criteria and Actions Required for Drought Response Stages for Toledo Bend and Gulf Coast Divisions	31
4.8.1	Stage 1 – Mild Water Shortage Conditions	31
4.8.1.1	Requirement for initiation	31
4.8.1.2	Requirements for termination	31
4.8.1.3	Goal	32
4.8.1.4	Measures.....	32

4.8.2	Stage 2 – Moderate Water Shortage Conditions.....	32
4.8.2.1	Requirement for initiation	32
4.8.2.2	Requirements for termination	32
4.8.2.3	Goal	32
4.8.2.4	Measures.....	33
4.8.3	Stage 3 – Severe Water Shortage Conditions	33
4.8.3.1	Requirements for initiation.....	33
4.8.3.2	Requirements for termination	33
4.8.3.3	Goal	34
4.8.3.4	Measures.....	34
4.8.4	Emergency Water Shortage Conditions (not related to drought)	35
4.8.4.1	Requirements for initiation.....	35
4.8.4.2	Requirements for termination	35
4.8.4.3	Goal	35
4.8.4.4	Measures.....	35
4.9	Water Allocation.....	36
4.10	Enforcement	36
4.11	Variances	36
4.12	Severability	37
4.13	Drought Contingency Plan Update Schedule.....	37

List of Tables

Table 1 Projected Population for SRA's Water Customers 2010-2060 10

Table 2 Wholesale Customers, Contracted Amount, and Amount Delivered FY-2008..... 10

Table 3 Total Amount of Water Diverted for Consumptive Uses Calendar Years 2003-2007 12

Table 4 Wholesale Population Served and Total Amount of Water Diverted for Municipal Use for the Previous Five Calendar Years 12

Table 5 TCEQ Permit Limits for SRA Systems within the Sabine River Basin..... 14

Table 6 Wastewater Treatments Plants Owned and Operated by SRA (CN600801864) 15

Table 7 Summary of Drought Triggers and Diversion Reduction Goals for Iron Bridge and Lake Fork Divisions 25

Table 8 Summary of Drought Triggers and Diversion Reduction Goals for the Toledo Bend Division 31

Table 9 Gulf Coast Division Drought Trigger Conditions 34

Table 10 Population Data for Counties at Least Partially within the Sabine Basin, Texas (2000 census)..... 47

Table 11 2006 Regional Water Plan County Population Projections for 2000 – 2060 for counties at least partially within the Sabine Basin, Texas..... 47

Table 12 Calculated Population Changes Expressed as a Multiplier 48

Table 13 Population Projections Adjusted for the Portion of each County within the Sabine Basin, Texas..... 49

Table 14 Population Projections for Municipal Raw Water Customers within the Sabine Basin Boundary 49

Table 15 Population Projections for Municipal Raw Water Customers Outside the Sabine Basin Boundary 50

List of Figures

Figure 1 Base Map of Sabine River Basin 2

Figure 2 Map of SRA Service Area..... 8

Figure 3 Projected SRA Service Area Population 2010-2060 9

Figure 4 Projected Sabine Basin Water Demand by Use 2010-2060 13

Figure 5 Projected Out-of-Basin Water Demand 2010-2060..... 14

Appendices

- Appendix A - SRA Board Resolution Adopting Conservation and Drought Contingency Plan
- Appendix B - Sources and Method for Calculation of Current and Projected Population
- Appendix C – DCP Public Involvement Notifications

Section 1 – Introduction

1.1 Sabine River Authority

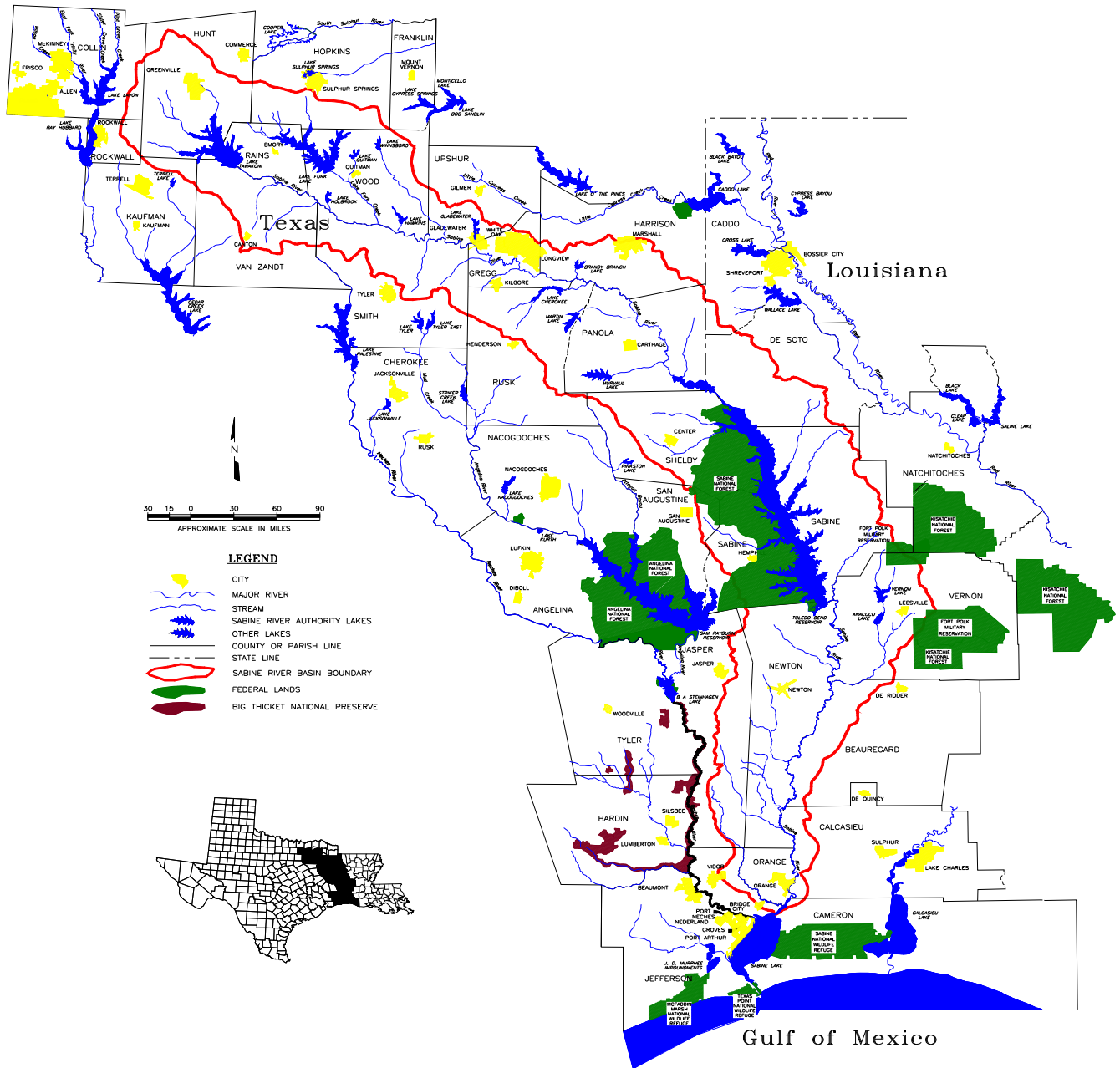
The Sabine River Authority of Texas (SRA) was created by the Legislature in 1949 as an official agency of the State of Texas. SRA was created as conservation and reclamation district with responsibilities to control, store, preserve, and distribute the waters of the Sabine River and its tributary streams in the Texas portion of the Sabine River Basin (Basin). The Sabine River Authority, State of Louisiana (SRA-LA) was formed in 1950 by the Louisiana Legislature. Representatives from the two states ultimately developed the Sabine River Compact, which is responsible for the allocation of waters in the Basin between the two States. Representatives of the state legislatures and Congress approved the Sabine River Compact in 1953.

SRA includes five operational divisions and two technical divisions: the Gulf Coast Division, Iron Bridge Division, Toledo Bend Division, Lake Fork Division, Parks and Recreation Division, Environmental Services Division, and the Resource Management and Project Development Division. The area of responsibility of SRA consists of the total contributing watershed of the Sabine River within the State of Texas. It includes all or portions of 21 counties: Collin, Franklin, Gregg, Harrison, Hopkins, Hunt, Jasper, Kaufman, Newton, Orange, Panola, Rains, Rockwall, Rusk, Sabine, San Augustine, Shelby, Smith, Upshur, Van Zandt, and Wood.

Figure 1 is a map of the Basin. The Sabine River has its headwaters in northwest Hunt County at an elevation of about 700 feet. The river flows eastward and is joined by the South Fork at the intersection of Hunt, Van Zandt, and Rains Counties within Lake Tawakoni. From Lake Tawakoni the river flows a distance of about 250 channel miles southeasterly to the boundary between Texas and Louisiana near the town of Logansport, Louisiana. The river then flows southward as the Texas-Louisiana boundary, emptying into Sabine Lake on the Gulf Coast. The total drainage area of the Basin is 9,756 square miles, with 7,426 square miles in Texas and 2,330 square miles in Louisiana.¹

¹ *Water for Texas*, Texas Department of Water Resources, 1984.

Figure 1 Base Map of Sabine River Basin



SRA is committed to providing adequate supplies of high quality water to municipal, industrial, agricultural and recreational users. Water conservation is an integral element of that commitment.

1.2 Purpose for Water Conservation

Holders of water rights of 1,000 acre-feet per year (ac-ft/yr) or more for municipal, industrial and other uses and 10,000 ac-ft/yr for irrigation are required to submit a water conservation plan (Title 30, Texas Administrative Code (TAC), Chapter 288). According to TAC Rule §288, conservation means “those practices, techniques, and technologies that will reduce the consumption of water, reduce the

loss or waste of water, improve the efficiency in the use of water, or increase the recycling and reuse of water so that a water supply is made available for future or alternative uses.” The Texas Commission on Environmental Quality (TCEQ) is responsible for oversight of these plans.

Requirements for water conservation plans for wholesale water suppliers include, as a minimum:

- Description of wholesaler’s service area including information on population, customer data, water use data, water supply system, and wastewater system.
- Specific, quantified five-year and ten-year targets for water savings including, where appropriate, target goals for municipal use in gallons per capita per day for the wholesaler's service area, maximum acceptable unaccounted-for water, and the basis for the development of these goals.
- Description as to which practice(s) and/or device(s) will be utilized to measure and account for the amount of water diverted from the source(s) of supply.
- A monitoring and record management program to determine water deliveries, sales, and losses.
- A metering, leak detection, and repair program for the wholesaler’s water storage, delivery, and distribution system.
- Every wholesale supply contract or contract renewal, including any contract extension, must include a requirement that each successive wholesale customer develop and implement a water conservation plan or conservation practices.
- A reservoir systems operations plan which includes optimization of water supplies as one of the significant goals of the plan.
- A means for implementation and enforcement.
- And, documentation of coordination with the regional water planning groups for the service area of the wholesale water supplier in order to ensure consistency with the appropriate approved regional water plans.

In addition to the minimum requirements cited above, the TCEQ provides guidance on additional conservation strategies that may be selected by water wholesalers if they are necessary to achieve the plan’s stated water conservation goals. These optional conservation strategies can include:

- Conservation-oriented water rates and water rate structures.
- A program to assist customers in the development of conservation plans.
- A program for reuse/recycling of wastewater/graywater.
- Any other appropriate practice.

Wholesale water providers are also required by TAC Rule §288.22 to prepare and submit:

- A drought management plan that includes an education and information program about the plan, notification procedures to identify the initiation and termination of the drought and the corresponding implementation and termination of the drought measures, trigger conditions signaling the start of any identified drought period, and drought water-use measures corresponding to each trigger condition.

1.3 Report Organization

INTRODUCTION presents background information on SRA, the purpose and goals for water conservation, and a description of the sections in this report.

SERVICE AREA AND SYSTEM EVALUATION evaluates SRA service area and supply system, including data on the Basin and out-of-Basin service area population and customers, water use, existing supply system, and historical and projected use.

CONSERVATION PRACTICES FOR A REGIONAL WHOLESALE SUPPLIER describes SRA's compliance with the requirements of TAC Chapter 288.

- Specific, quantified 5-year and 10-year targets for water savings.
- Practices and devices used to measure and account for the amount of water diverted.
- SRA's monitoring and record management program for determining water deliveries, sales, and losses.
- SRA's leak detection and repair program.
- SRA's universal metering and meter repair and replacement program.
- Description of conservation and drought contingency planning section in all new and renewed water sales contracts.
- Description of reservoir systems operations plans that include optimization of water supplies as one of the significant goals.
- SRA's means of implementation and enforcement.
- Documentation of coordination with Regional Water Planning Groups in SRA's service area.
- Other conservation measures
 - Water conservation education and information programs.
 - Technical assistance available from SRA in development of conservation plans.
 - Recycling and reuse.
 - Best management practices.
 - SRA's Community Assistance Program.
- Review and update schedule.

DROUGHT CONTINGENCY PLAN describes SRA's compliance with the requirements of TAC Title 30, Chapter 288 and includes:

- An education and information program about the plan.
- Trigger conditions criteria for initiation and termination of drought conditions.

- Notification procedures on initiation and termination of drought conditions and measures.
- Drought water-use measures associated with each trigger condition.
- Water allocation.
- Enforcement, variances and severability.
- Review and update schedule.

Section 2 – Service Area and System Evaluation

2.1 Water Supply and Wastewater System

SRA owns and operates four major projects in the Sabine Basin (Basin): the John W. Simmons Gulf Coast Canal System, Iron Bridge Dam and Reservoir (Lake Tawakoni), Lake Fork Dam and Reservoir, and Toledo Bend Dam and Reservoir. Water diverted from the John W. Simmons Gulf Coast Canal System is used for municipal, industrial, and irrigation purposes. The three reservoirs primarily serve as sources of water supply and provide recreational opportunities, although Toledo Bend, a joint project of SRA and SRA-LA, is also equipped to generate hydroelectric power with releases from the reservoir.

The Gulf Coast Division operates the John W. Simmons Gulf Coast Canal System that serves the Orange County area. The main canal is approximately 30 miles long and has over 45 miles of lateral canals that branch off to serve customers in the area. There are 12 diversions from the canal system with contract maximums totaling 72,009 acre-feet per year (ac-ft/yr) or 64.3 million gallons per day (mgd). The pump station, on an intake canal off of the Sabine River, has a design capacity of approximately 360 mgd and the conveyance capacity is 346,000 ac-ft/yr (309 mgd). The canal system supplies water to a municipality and several industries including petrochemical plants, a pulp and paper mill, a steel mill, and an electric generating station, and for irrigation. The Gulf Coast Division operates the SRA 1 Plant wastewater treatment plant (WWTP) located in Orange County.

Toledo Bend Dam and Reservoir, managed by the Toledo Bend Division, lies on the state boundary of Texas and Louisiana. The reservoir yield of 2,086,600 ac-ft/yr (1,862.7 mgd) is shared equally between the two states. The storage capacity of the reservoir is 4,477,000 ac-ft. Six Texas diversions serve five municipal customers and one industrial customer with contracts totaling 20,279 ac-ft/yr (18.11 mgd). In addition to serving as a water supply source, Toledo Bend Dam provides hydroelectric power that represented a non-consumptive use of 3,356,570 ac-ft in 2007.

Iron Bridge Dam and Lake Tawakoni are located in parts of Hunt, Rains, and Van Zandt Counties and are managed by the Iron Bridge Division of SRA. The reservoir has an as-built storage capacity of 927,440 ac-ft and a permitted yield of 238,100 ac-ft/yr (212.6 mgd). The City of Dallas, through its Dallas Water Utilities Division (DWU), maintains a contract with SRA for 80 percent of the yield of the project. Iron Bridge Division has 9 water supply contracts which allow diversion of up to 236,715 ac-ft/yr (211.33 mgd) from Lake Tawakoni. The Iron Bridge Division operates and maintains all facilities for the Iron Bridge Dam and Lake Tawakoni Reservoir and also operates both the Wind Point Park wastewater treatment system and the Lake Tawakoni State Park WWTP which serve areas near the reservoir.

Lake Fork Dam and Reservoir, operated by the Lake Fork Division of SRA, is located in Wood, Rains, and Hopkins Counties. The reservoir has an as-built storage capacity of 675,819 ac-ft and a permitted yield of 188,660 ac-ft/yr (168.4 mgd). DWU maintains a contract with SRA for about 70 percent of the yield of the project. Seven entities have eight Lake Fork Division contracts to divert up to 169,082 ac-ft/yr of water from Lake Fork Reservoir, with 35,262 ac-ft/yr of that total amount contracted for release to four downstream customers. The Lake Fork Division also operates the Lake Fork WWTP No. 1 which serves some areas near the reservoir.

SRA also maintains a **Joint Use Permit** for Lake Tawakoni and Lake Fork Reservoirs which allows SRA to sell water from one reservoir with the water actually being diverted from the other reservoir

provided all appropriate permit conditions are met. SRA currently allows eleven entities with a total of sixteen contracts for 19,533 ac-ft/yr of water from Lake Fork Reservoir to divert their Lake Fork Reservoir water supplies from Lake Tawakoni Reservoir under this Joint Use Permit.

The total contracted diversion amounts from Lake Tawakoni and Lake Fork Reservoir identified above do not include diversions under a contract referred to as the North Texas Municipal Water District (NTMWD) Interim Water Contract. The Interim Water Contract allows NTMWD to use water reserved for SRA wholesale customers (other than Dallas) but not currently needed. The NTMWD Interim Water Contract is subordinate to pre-existing SRA wholesale customers' contracts and the subordinate status of the NTMWD Interim Water Contract is taken into account in applying the Drought Contingency Plan. The annual amount of interim water available to NTMWD under the NTMWD Interim Water Contract is determined prior to each calendar year based upon the estimated amount of water which is expected to be unused during the coming year by the existing wholesale customers who have contracted for long-term future supplies beyond their current actual required usage.

2.2 SRA Service Area Population, Historical and Projected Use

Twenty-one counties lie entirely or partially within the Basin, but the population and area currently served by SRA is not easily defined since many SRA-supplied entities receive water from multiple sources and distribute water to multiple customers. For the purposes of this Plan, SRA's service area is defined as the Texas portion of the Basin plus entities outside the geographic Basin that use SRA raw water—City of Dallas, City of Commerce, NTMWD, and City of Rose City. In some sections of this report, especially those dealing with water use estimates, only the population and service area of current SRA raw water customers is used, excluding regions of the Basin that do not contract for water from SRA projects.

- SRA's service area, determined using a Geographic Information System (GIS), is 11,201 square miles. This area includes the Texas portion of the Basin as well as the service area of current customers outside the geographic Basin. The service area population, determined using 2000 Census GIS data, is 2,212,201 with 501,729 of that population being in-Basin. The current population served for water supply is 2,368,772 (Appendix B - Sources and Method for Calculation of Current and Projected Population). Population served for wastewater is negligible and confined to four small wastewater treatment systems. Figure 2 is a map of the SRA service area.

Figure 2 Map of SRA Service Area

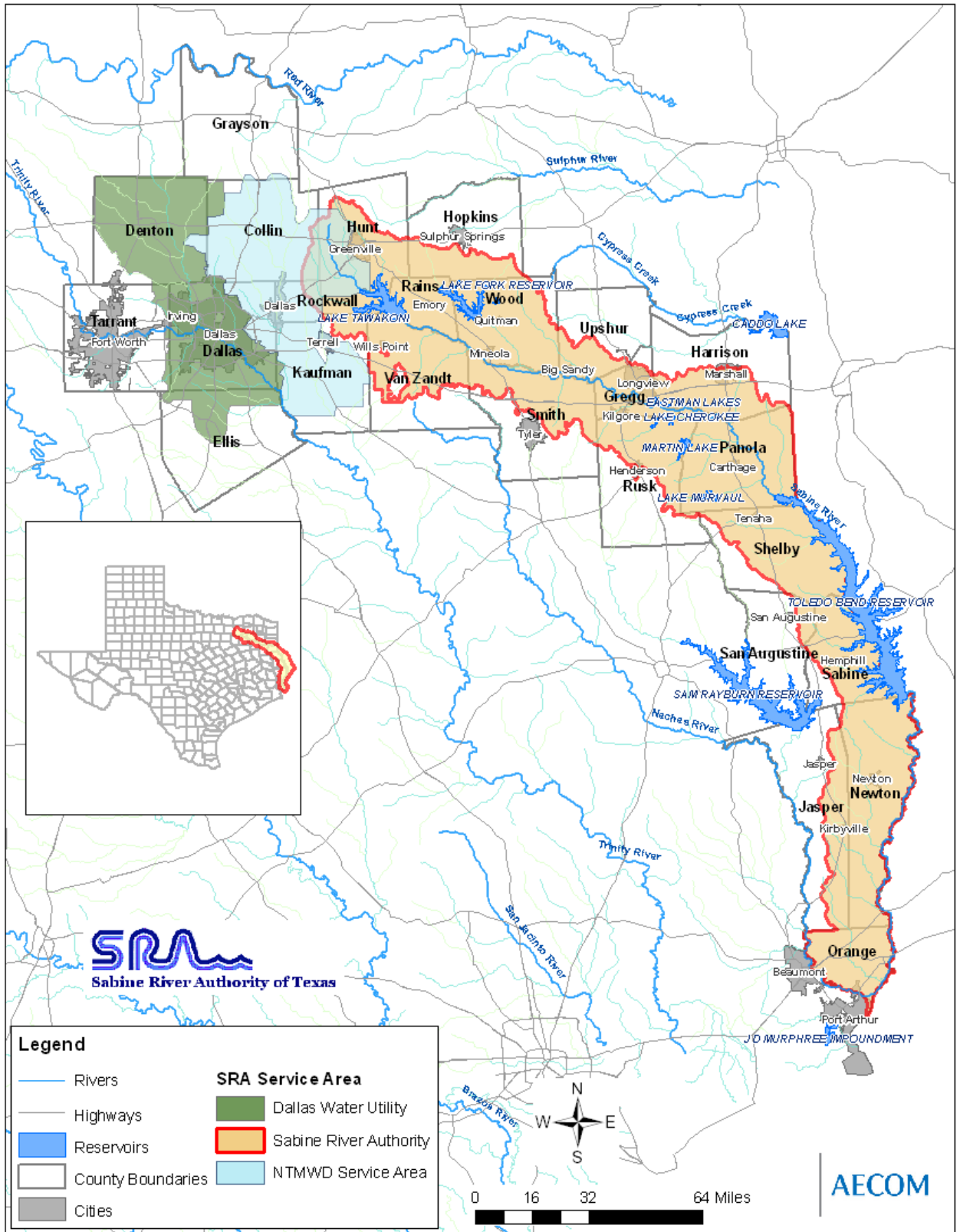
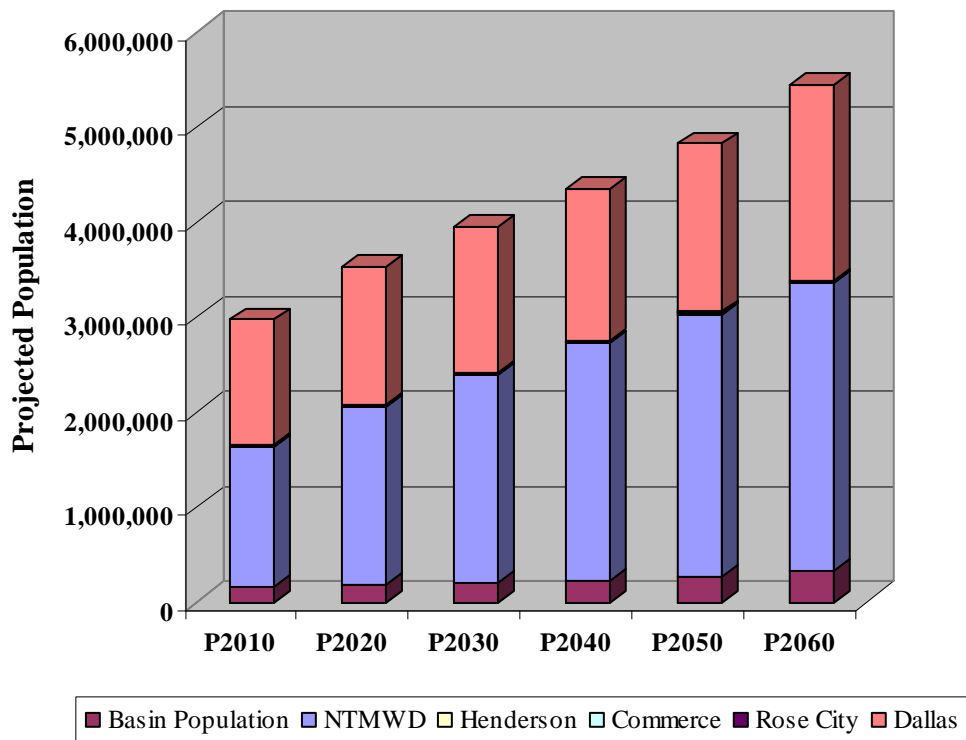


Figure 3 shows SRA's service area population projected through 2060 based on TWDB-approved 2000-2060 population projections for water user groups in each of the 16 planning regions.² This figure shows a near doubling of SRA's service area population by 2060.

Figure 3 Projected SRA Service Area Population 2010-2060



² <http://www.twdb.state.tx.us/wrpi/data/proj/popproj.htm>, referenced 9/2/2008. Please note that the City of Henderson is located on the Basin divide.

Table 1 shows the projected population for SRA's water customers for each decade until 2060.

Table 1 Projected Population for SRA's Water Customers 2010-2060

Decade	2010	2020	2030	2040	2050	2060
In-Basin Water Customer Pop.	169,848	185,840	203,588	226,535	268,672	331,672
Out-of-Basin Water Customer Pop.	2,799,918	3,344,797	3,739,825	4,118,749	4,549,402	5,113,154
Total Water Customers Pop.	2,969,766	3,530,637	3,943,413	4,345,284	4,818,074	5,444,826

Source: 2006 TWDB-approved projections

The population projections are from the 2006 Regions C, D, and I Regional Water Plans created by TWDB. As a river authority and regional wholesale water provider, SRA depends on the TWDB for official population data for state surface water consumers.

Table 2 lists SRA's wholesale customers, the contracted amount of water for each, and the amount of water delivered in Fiscal Year (FY) 2008. Note that since water availability varies significantly from the upper Basin (Lake Tawakoni/Lake Fork) to the lower Basin (Toledo Bend/Gulf Coast Division), each division is summarized separately and then totaled.

Table 2 Wholesale Customers, Contracted Amount, and Amount Delivered FY-2008

Contractor Name	Contracted Amount (ac-ft)	FY-2008 Amount of Water Delivered (ac-ft)
Gulf Coast Division		
A. Schulman	224	-0-
Chevron Phillips	2,240	1,075
City of Rose City	479	78
E.I. DuPont	24,643	15,165
Entergy	4,481	2,957
Firestone Polymers	737	1,859
Gerdau Ameristeel	1,120	650
Honeywell	1,120	638
Cottonwood Energy	13,442	3,349
Irrigation	NA	448
Lanxess	1,120	3,293
Misc.	NA	11
Temple Inland	22,403	17,584
Gulf Coast Division Totals	72,009	47,107
Toledo Bend Division		
Beechwood WSC	190	0
City of Hemphill	1,841	669
City of Huxley	280	216
El Camino Water System	18	16
Pendleton Utilities Corp.	28	58
Tenaska	17,922	3,389

Contractor Name	Contracted Amount (ac-ft)	FY-2008 Amount of Water Delivered (ac-ft)
Toledo Bend Division Totals	20,279	4,348
Lake Fork Division		
Able Springs WSC*	1,120	258
Bright Star Salem SUD	840	-0-
Cash SUD*	4,124	-0-
City of Dallas	131,860	-0-
City of Edgewood*	840	3
City of Emory*	2,016	-0-
City of Greenville*	4,481	-0-
City of Henderson	5,041	963
City of Kilgore	6,721	2,240
City of Longview	20,000	2,811
City of Point*	224	-0-
City of Quitman	1,120	336
Combined Consumers SUD*	2,240	717
Eastman Chemical	3,500	-0-
Lone Oak Land Development*	384	146
Mac Bee SUD*	2,240	582
South Tawakoni WSC*	1,680	358
Tawakoni Plant Farm Ltd.*	184	157
Lake Fork Division Totals	188,615	8,571
Iron Bridge Division		
Cash SUD	1,679	1,266
City of Dallas	190,480	76,294
City of Emory**	1,212	851
City of Greenville	21,283	5,142
City of Point	224	168
City of West Tawakoni	1,120	268
City of Wills Point	2,240	258
Commerce Water District	8,396	1,355
NTMWD	10,081	2,285
Iron Bridge Division Totals	236,715	87,887
Total All Division	517,618	147,913

*Indicates Lake Fork Division contract but water is diverted from Lake Tawakoni under Joint Use Water Right

** Includes Community Water Company (to Emory).

The total contracted amounts from the Iron Bridge Division and Lake Fork Division identified above do not include the up to 40,000 ac-ft/yr of water contracted to NTMWD under the "Interim" contract as described in Section 2.1.

Table 3 lists the total amount of water diverted for the previous five calendar years for all consumptive uses. The 2007 total in Table 3 is the total amount of raw water provided under all wholesale contracts for the most recent year.

Table 3 Total Amount of Water Diverted for Consumptive Uses Calendar Years 2003-2007

Year	2003	2004	2005	2006	2007
Jan	13,310	5,584	17,786	17,608	7,893
Feb	6,074	4,829	12,282	24,414	5,114
Mar	6,086	5,973	14,499	20,610	12,053
Apr	5,767	5,626	17,677	20,670	16,947
May	10,253	5,850	25,950	17,021	11,325
Jun	19,304	23,580	29,195	24,025	14,995
Jul	20,018	25,596	29,557	24,713	18,296
Aug	20,103	10,689	29,239	24,997	23,914
Sep	9,998	21,942	20,937	26,591	18,082
Oct	8,940	9,715	26,354	25,838	14,080
Nov	6,127	5,902	21,161	17,853	12,382
Dec	8,436	13,850	18,656	28,109	15,049
Totals In ac-ft	134,416	139,135	263,293	272,449	170,130

Table 4 illustrates the wholesale population served for municipal use by SRA 2003 - 2006 and the total amount of water diverted for municipal use for calendar years 2003 - 2007. SRA, as a river authority and a regional wholesale water supplier, depends on the TWDB for official population data for water consumers in its service area.

Table 4 Wholesale Population Served and Total Amount of Water Diverted for Municipal Use for the Previous Five Calendar Years

Year	Total Pop. Served	Annual Water Diverted for Municipal Use (ac-ft)
2003	1,408,455	75,675.5
2004	1,413,575	84,172.5
2005	1,423,083	202,780.6
2006	1,440,526	207,395.0
2007	*	116,236.5

* Official population data for 2007 is not yet available from TWDB Historical Water Use Surveys (Texas State Data Center).

Using TWDB-approved 2010-2060 population projections³ for water user groups in each of the three planning regions, Figure 4 shows the projected water demand by use for Basin counties through 2060. As Figure 4 illustrates, the TWDB is projecting a more than 50 percent increase in municipal demand and overall Basin water needs from 2010 to 2060, TWDB projections for counties in SRA's

³ <http://www.twdb.state.tx.us/wrpi/data/proj/popproj.htm>, referenced 9/2/2008.

out-of-Basin service area (out-of-Basin data not included in Figure 4) indicate that municipal and overall demand will increase nearly 80 percent from 2010 to 2060. The out-of-Basin municipal demand projections are shown in Figure 5.

Figure 4 Projected Sabine Basin Water Demand by Use 2010-2060

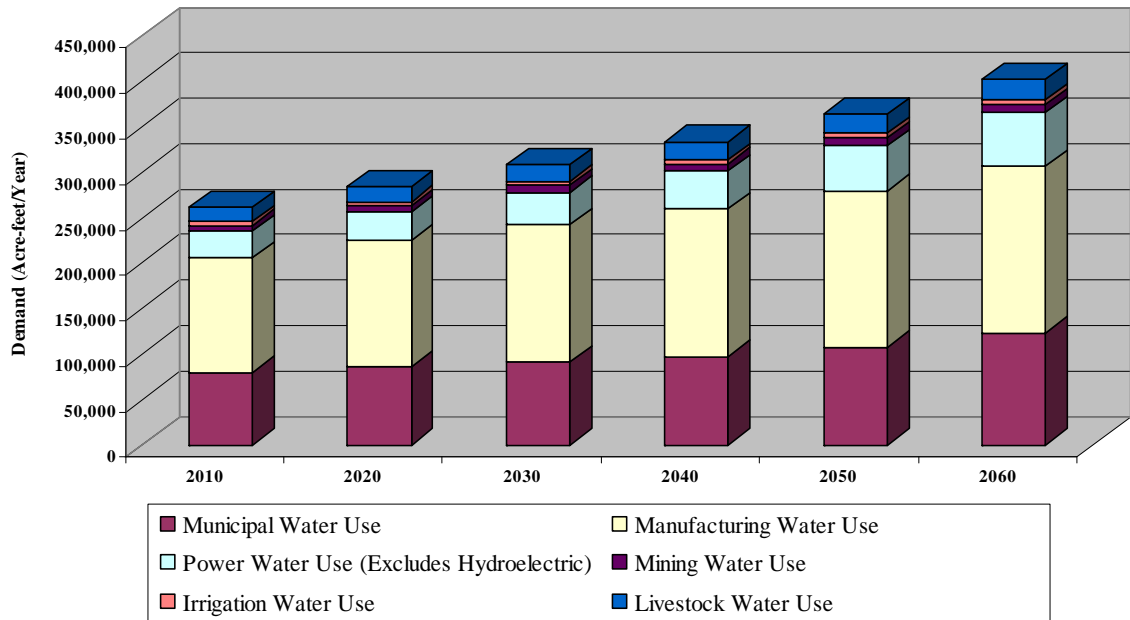
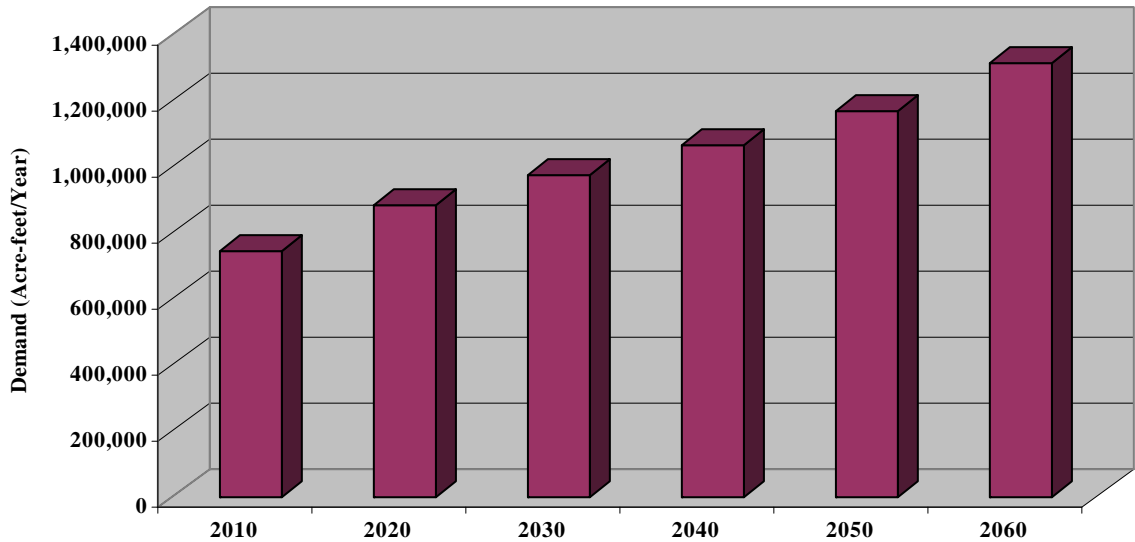


Figure 5 Projected Out-of-Basin Water Demand 2010-2060



The surface water supply sources of SRA’s service area are described in Table 5. SRA does not supply groundwater or water from any other source and does not supply treated water.

Table 5 TCEQ Permit Limits for SRA Systems within the Sabine River Basin

System	SRA Water Right No.	Impoundment Right (ac-ft)	Diversion Right (ac-ft/yr)	Contract Total (ac-ft/yr)
Toledo Bend	CA-4658	4,477,000	750,000 (293,300*)	20,279
Gulf Coast Canal System	CA-4662	NA	147,100	72,009
Lake Fork	CA-4669	675,819	188,660	188,615**
Lake Tawakoni	CA-4670	927,440	238,100	236,715**
Totals			1,323,860	517,618

* SRA has applied for an amendment to its water right permit for an additional 293,300 ac-ft/yr from the Texas portion of Toledo Bend which is not yet approved.

** SRA’s joint use permit provides for contracted water from Lake Tawakoni and Lake Fork to be diverted from either reservoir.

SRA, as a river authority and a regional wholesale water supplier, depends on the TCEQ for data on the wastewater treatment systems in its service area. Table 6 describes the wastewater treatment plants owned and operated by SRA.

Table 6 Wastewater Treatments Plants Owned and Operated by SRA (CN600801864)

TCEQ Name	TCEQ Number	Design Capacity, MGD	How treated wastewater disposed	Receiving Stream	Location	Description of area serviced
Lake Tawakoni State Park WWTP	RN103014023	0.030	Direct discharge into Lake Tawakoni (Segment 0507)	Lake Tawakoni	Approx. 3500 ft S-SE of Spring Point & approx. 4000 ft NW of Autumn Point near White Deer Ranch on the SW shore of Lake Tawakoni in Hunt County	Serves Tawakoni State Park and adjacent mobile home community
SRA 1 Plant	RN101528420	0.003	Direct discharge into drainage ditch; then to Sandy Creek; then to Cow Bayou Tidal (Segment 0511)	Cow Bayou Tidal	SW corner of intersection of SH 62 and Southern Pacific Railroad approx. 2.7 mi NE of Orangefield in Orange County	Serves a small plastics warehouse in Orange County
Wind Point Park	RN102076510	0.020	Direct ground application via sprinkler system	NA	Approx. 4.5 miles southwest of the intersection of US HWY 69 and FM 1571 on Park Road 55 in Hunt County	Serves a largely transient, seasonal recreation population
Lake Fork WWTP No. 1	RN102183308	0.030	Direct discharge into 6 acre pond; then to Lake Fork (Segment 0512)	Lake Fork	Located 200 ft E of FM 2946 approx. 1.2 mi S of the intersection of FM 2946 and HWY 514 and approx. 7.5 mi ENE of the City of Emory in Rains County	Serves a residential golf course community

Section 3 – Conservation Practices for a Regional Wholesale Supplier

The Sabine River Authority of Texas' (SRA) conservation activities consist of those that improve its efficiency in producing and marketing raw water and those that encourage or support the conservation of supplies by its customers. SRA recognizes that it can promote conservation most effectively by protecting the resources it has developed through efficient system operation and watershed management planning. A discussion follows of the conservation practices applicable to SRA as a wholesale supplier in compliance with Texas Administrative Code (TAC) Rule §288.5.

As described in more detail within the previous sections of this document, while SRA is the exclusive holder of the water rights for both reservoirs, the yield of both Lake Tawakoni and Lake Fork have been allocated to SRA and Dallas Water Utilities (DWU) through contractual agreement between the two parties. SRA's allocation is 20% and approximately 30% from Lake Tawakoni and Lake Fork respectively, and the remaining permitted yield is contractually obligated to DWU. In addition, SRA also maintains a contract to supply temporarily unused, or interim, water (up to 40,000 ac-ft/yr) from both reservoirs with the North Texas Municipal Water District (NTMWD). Both the DWU and the NTMWD are themselves wholesale water providers with substantial water resources and large service areas throughout the Dallas Metroplex which are supplied through use of their respective multiple water sources. Consequently, both DWU and NTMWD maintain comprehensive Water Conservation Plans for their individual systems and it is not intended that this Sabine Basin Water Conservation Plan should apply to any part of the service area except SRA's in-basin customers and those specific out-of-basin customers not otherwise covered by other wholesale conservation plans.

3.1 Targets for Water Savings

3.1.1 Target Goals for Municipal Use in Gallons Per Capita Per Day

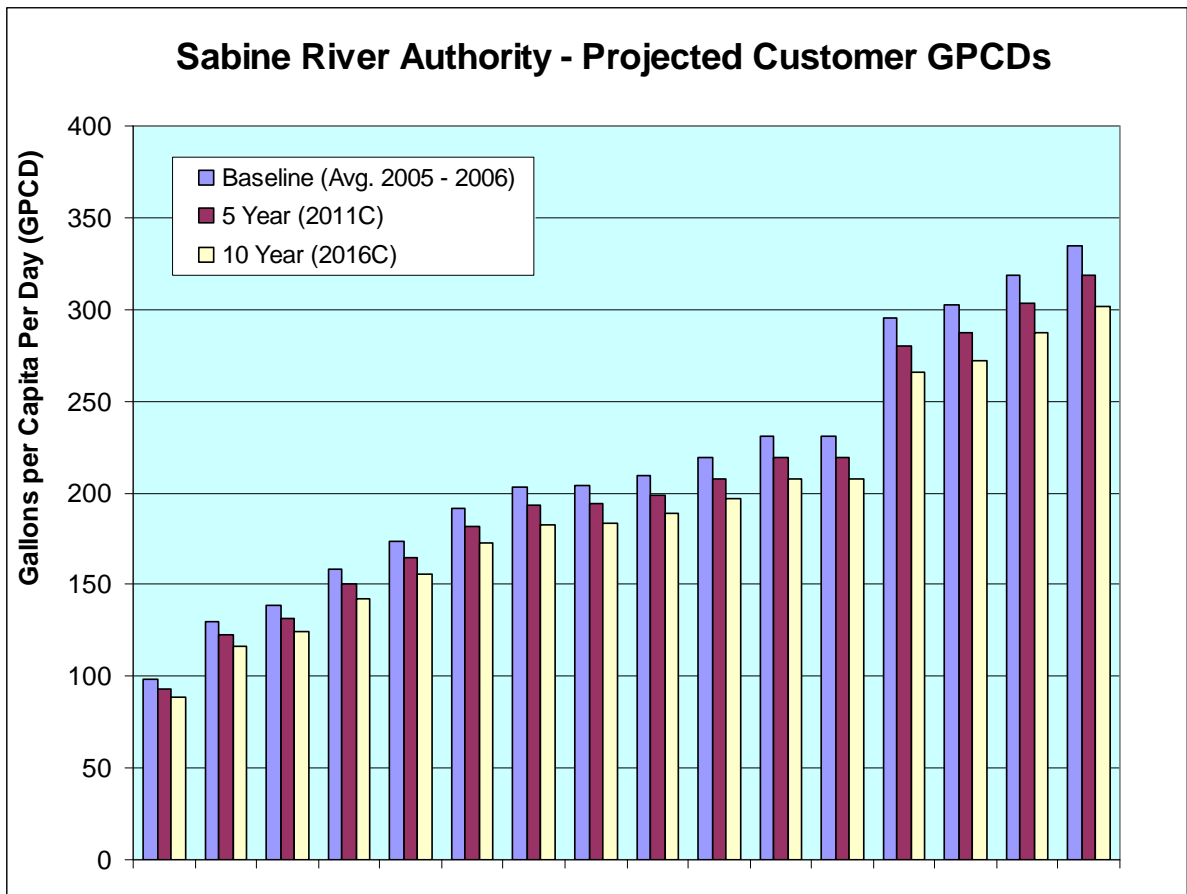
Per-capita water use, measured by gallons per person per day (gpcd), varies according to climate, geography, and an individual water utility's population and service profile.⁴ This is especially true in the Sabine Basin due to its large size and variable geographic and hydrologic conditions. For the purposes of identifying specific, quantified, and voluntary five-year and ten-year target goals for municipal use in gpcd, SRA's wholesale service area is limited to all of its existing, contracted customers except DWU and NTMWD Interim.

The target goal for SRA municipal water customers is a voluntary minimum annual reduction of one percent in total gpcd. SRA realizes that this is an ongoing process, and will update these target goals as new guidelines are adopted by Texas Water Development Board (TWDB) and Texas Commission on Environmental Quality (TCEQ), or the Senate Bill 1 (SB-1) Regional Water Planning Groups (RWPG), and as new data becomes available.

⁴ Several of SRA's municipal customers have other sources of water, including ground water, run-of-river water rights, and other sources of surface water.

The latest available annual TWDB water use survey summary estimates (2005 and 2006) include gpcds for sixteen of SRA’s municipal customers.⁵ To account for variations in the estimated gpcds in these two surveys, SRA used an average of the gpcd estimates in the 2005 and 2006 surveys as a baseline. The baseline gpcds range from 98 gpcd to 335 gpcd. Of the sixteen municipal customers, one had less than 100 baseline gpcd, two ranged from 100 to 150 baseline gpcd, three customers ranged from 150 to 200 baseline gpcd, and ten customers had greater than 200 baseline gpcd. Figure 6 charts these projections in ascending order of the 2005-2006 average baseline. Some of the higher GPCD figures in Figure 6 are to various degrees influenced by factors that can skew gpcds higher than anticipated, such as exportation of water and light industrial and/or commercial use.

Figure 6 Five and Ten Year Projected Municipal Customer GPCDS



SRA, as a river authority and a regional wholesale water supplier, depends upon the TWDB for official gpcd data for water users in its service area and will re-evaluate these projections in future revisions of the Plan as additional data and corrections are made available.

SRA will assist its customers in reducing their gpcd in any way that is practical, reasonable, and cost-effective.

⁵ <http://www.twdb.state.tx.us/wrpi/wus/summary.htm>, referenced 9/09/2008. These estimates are subject to revision as additional data and corrections are made available to the TWDB.

3.1.2 Target Goals for Maximum Acceptable Unaccounted-for Water

Unaccounted-for water (UFW) is the difference between the amount of water delivered to a customer (by SRA or other supplies) and the amount of water accounted for through individual retail customer metering. UFW is created through unmetered use, water lost to leaks and breaks, theft, and inaccurate meters. As a general rule of thumb, a well-managed water distribution system typically experiences 10-15 percent UFW, and the American Water Works Association (AWWA) Leak Detection and Accountability Committee recommended 10 percent as a benchmark for UFW⁶.

The target goal for SRA municipal water customers for 2009 and subsequent years is a voluntary maximum ratio of unaccounted-for water to total water supplied to the distribution system by SRA (or other sources as applicable) of 10 percent. Each customer should take measures to control unaccounted-for water as part of their routine operations. If unaccounted-for water exceeds the 10 percent goal, the customer should implement a water audit that identifies and then develops a plan to reduce the source(s) of unaccounted-for water.

3.2 Practices and Devices to Measure Water Diverted

Flow meters are used to measure and account for all water diverted from SRA's water supply system and all water sales will continue to be metered in order to accurately record the amount of water used. SRA installs, operates, and maintains measuring equipment at the point of release from the water supply, or requires the customer to install and maintain this equipment. All new and renewed raw water supply contracts require the buyer to furnish and maintain water meters that must measure in accordance with AWWA Standards with an accuracy tolerance not to exceed two percent. Meters are calibrated by their owner with the other party having the right to be present during the calibration.

3.3 Monitoring and Record Management Program

Diversion tracking meters on the canal system are read by SRA personnel and recorded in a journal at the Gulf Coast Division office. Water supply customers taking water from the reservoirs or run of the river read their meters and report the amount of water taken to the appropriate operations division and these totals are subsequently reported to SRA's Operations Branch office. Annually, monthly diversion totals for each SRA water right are reported to the TCEQ by SRA's Operations Branch office. Copies of these reports and supporting data are on file at the Authority General Office in Orange, Texas.

An operational "Accounting Plan" for Lake Tawakoni Reservoir and Lake Fork Reservoir are maintained by both SRA and DWU. As a part of the routine monitoring and record management program of the two reservoirs, SRA and DWU storage amounts are estimated each month within Lake Tawakoni and Lake Fork Reservoirs through use of these accounting plans. These accounting plans record monthly inflows, releases, net rainfall/evaporation, and reported diversions from the reservoirs. Both SRA and DWU have established procedures for recording and approving the monthly data required for the accounting plans.

⁶ "Committee Report: Water Accountability", AWWA Leak Detection and Water Accountability Committee, Journal AWWA, July 1996.

3.4 Leak Detection and Repair

SRA encourages prompt leak detection and repairs to prevent or reduce water loss from pipelines and distribution systems through several mechanisms:

- SRA provides information on the availability of leak detection equipment from the TWDB
- SRA will also facilitate the use of TWDB equipment by coordinating with its customers and the TWDB to obtain the equipment
- SRA will provide technical assistance to any water supply customer or Basin user to minimize unaccounted-for water losses by promoting the conservation services of the TWDB and the Texas Rural Water Association (TRWA). These services include technical assistance in developing water conservation programs, information and educational materials on water conservation, leak detection and water audit assistance, and information on water reuse, desalting, and alternative water sources. The TRWA provides water audits and leak detection services to rural users or water supply corporations

The John W. Simmons Gulf Coast Canal System, the only distribution system owned and operated by SRA, experiences variable water loss through the canal system depending, to a great extent, on weather conditions. SRA has an ongoing program for rapid leak detection and repair. Key components of this program include:

- Regular inspections and maintenance of the canal system by SRA.
- A biannual inspection of the entire canal system to identify inefficiencies and maintenance requirements.
- Regular maintenance activities and improvements to the pump station and canal systems are identified to ensure that the system is operating as efficiently as possible.

3.5 Conservation and Drought Contingency Stipulations of Water Sales Contracts

SRA requires all customers signing new and renewed raw water supply contracts to adopt SRA's Water Conservation and Drought Contingency Plan (Plan) as well as develop and implement its own TCEQ-approved water conservation and drought contingency plans. Each customer's plan should follow guidelines provided by the TCEQ⁷ and as stipulated in Title 30 TAC Chapter 288. Furthermore, contracts also now stipulate that customers must implement the section of SRA's Plan as well as their own when trigger conditions occur. The time frame associated with full implementation of this requirement is dependent on the various expiration dates of existing contracts and options.

3.6 Reservoir Systems Operations Plans

SRA currently has a joint use permit for Lake Tawakoni and Lake Fork Reservoirs that allows diversions from either reservoir under appropriate circumstances. DWU has recently completed construction of a large diameter conveyance pipeline and a large capacity pumping station on Lake Fork Reservoir which will allow the physical transfer of water from Lake Fork Reservoir to Lake Tawakoni Reservoir. Additionally, SRA and DWU are evaluating opportunities for future "**System**

⁷ http://www.tceq.state.tx.us/nav/util_water/conservation.html, referenced 2/16/2009.

Operation of these reservoirs with Toledo Bend Reservoir⁸ which would allow a small increase in the total available water supply from the entire system.

3.7 Implementation and Enforcement of Plan

SRA's operations divisions, through the routine operation and maintenance of reservoirs and the canal system, implement conservation measures directed at improving SRA's water conservation and efficiency.

The terms and conditions of new and renewed water contracts specify the required conservation measures for each customer and implement SRA's conservation and drought contingency program as it relates to water sales. Current new and renewed contracts stipulate that all customers 1) must comply with all TCEQ, TWDB, or any other federal, state, or local rules and regulations pertaining to the beneficial use and conservation of water including the development and implementation of conservation plans, 2) must install and maintain measuring equipment meeting AWWA or other current industry standards to accurately measure the amount of water diverted, and 3) must calibrate all measuring equipment at least every two years and provide a report of the calibration to SRA.

The SRA Board of Directors has adopted this Plan as indicated by SRA Board Resolution Adopting Conservation and Drought Contingency Plans in Appendix B.

3.8 Coordination with the Regional Water Planning Groups (RWPG)

SRA facilitates regional water conservation and drought contingency planning through its participation in RWPG activities for its service area, mainly Regions D and I but also a small but increasingly populous part of Region C. SRA will provide a copy of this Plan to the chairman of each of these Regions.

SRA serves as a river authority representative for Region D and Region I, the planning groups with the largest areas within the Basin. As such, SRA is actively involved in regional planning activities in the Basin and adequate coordination between the RWPG planning efforts and those of SRA is assured.

3.9 Additional Water Conservation Strategies

3.9.1 Education and Information Program

SRA offers a coordinated water conservation public education and information program in cooperation with its customers. Key components of SRA's education and information program include:

- SRA's Public Information Officer coordinates SRA's overall public information and education outreach efforts.
- SRA welcomes visitors to Division offices and conducts tours of the reservoir facilities to educate the public about the importance of conserving water and protecting water resources from pollution.

⁸ *Upper Sabine Basin Water Supply Study*, March 2003, p.7, <http://www.sratx.org/srwmp/usbwss/default.asp>, referenced 2/24/2009.

- SRA provides knowledgeable staff speakers for civic meetings to discuss water issues, including water conservation.
- SRA participates in the *Major Rivers* conservation education program for fourth grade students.⁹ *Major Rivers* was developed to help educate Texas students about water and the importance of using it wisely. SRA distributes the educational materials at no charge to elementary schools throughout the Basin.
- SRA maintains a website¹⁰ to provide the public with current information on water resource management activities, conservation opportunities, and data on water supply and quality conditions. A copy of this Plan is available for download from the website as well.

In addition to continuing its own information and education programs, SRA encourages its customers to enhance the awareness of water conservation through the following measures:

- Providing a conservation message that may be included in the monthly water bills at least quarterly.
- Encouraging the boards of education and teachers in the school systems to become involved in water conservation through classroom lectures and incentives for children to conduct home checks.
- Preparing an information brochure on conservation that is distributed in places of easy public access such as school and college libraries, churches, headquarters of civic groups and other organizations.
- Using the Internet and print media, such as local newspapers, to disseminate information through articles discussing benefits of water conservation.
- Purchasing conservation literature from the TWDB for distribution by retail utilities in the Basin.

3.9.2 Technical Assistance in Development of Conservation Plans

SRA provides a copy of this Plan with the offer of technical assistance toward the development of conservation plans to each customer. Specifically,

- SRA will provide water conservation planning information and assistance on its website with links to TCEQ, TWDB, TRWA, AWWA, and Texas Water Conservation Association (TWCA) websites.
- SRA will assist local entities that are required by TCEQ to have a plan to develop those plans; and, for those entities not required by TCEQ to have a plan, SRA will help them voluntarily develop plans.

Through technical assistance, SRA will continue to encourage and support efficient water use and reduced waste. In addition, information on technical assistance in developing water conservation programs available through the TWDB and the TCEQ is also offered to customers.

⁹ <http://www.rra.dst.tx.us/education/majrivers/>, referenced 4/28/2009.

¹⁰ <http://www.sratx.org>, referenced 4/28/2009.

3.9.3 Recycling and Reuse Programs

SRA encourages its water customers to conserve water by recycling water and by implementing indirect or direct water reuse practices where feasible. SRA and DWU recently conducted a joint study of water reuse for the upper basin region, which investigated the feasibility of storing recycled water within Lake Tawakoni Reservoir. The preliminary study evaluated the various technical options and estimated cost and impacts of conveying recycled water from various Trinity basin wastewater treatment facilities to constructed wetlands and eventually into final storage within Lake Tawakoni Reservoir. These studies are expected to be continued and expanded further in the future.

3.9.4 Best Management Practices (BMPs)

SRA encourages its water customers to implement water conservation BMPs that are applicable, proven, and cost-effective. The Water Conservation Implementation Task Force, created by Senate Bill 1094 (78th Legislature), has compiled the Water Conservation Best Management Practices Guide,¹¹ a list of voluntary management practices that water users may reference in addition to the required components of TAC, Chapter 288.

3.9.5 Community Assistance Program

SRA's Community Assistance Program¹² provides competitive grants of up to \$10,000 per calendar year that can complement or leverage water project funds for entities within the Basin. Funds provided for the grant program must fall within four project categories, one of which is water conservation.

3.10 Review and Update Schedule

SRA will continue to review and update this Plan every five years hereafter to coincide with the planning cycle of the RWPGs within SRA's service area. SRA recognizes that the Plan is a living document and will update it as regulations change or new conservation measures are introduced.

¹¹ Texas Water Development Board, Report 362, Water Conservation Implementation Task Force, Water Conservation Best Management Practices Guide, November 2004, [TWDB 2004 b], <http://www.twdb.state.tx.us/assistance/conservation/TaskForceDocs/WCITFBMPGuide.pdf>, referenced 2/13/2009.

¹² <http://www.sratx.org/services/ecodev/cap/default.asp>, referenced 2/17/09

Section 4 – Drought Contingency Plan

4.1 Declaration of Policy, Purpose, and Intent

In order to conserve the available water supply and/or to protect the integrity of water supply facilities, with particular regard for domestic water use, sanitation, and fire protection, and to protect and preserve public health, welfare, and safety and minimize the adverse impacts of water supply shortages and other water supply emergency conditions, SRA adopts the following Drought Contingency Plan (DCP).

4.2 Public Involvement

SRA provided its wholesale water customers and the public opportunity to comment on and provide input to the development of this plan by:

- Posting a draft version of this plan on the SRA website and accepting comments on the draft plan.
- Notifying all wholesale water customers of the proposed plan and its location on SRA website (see Appendix C – DCP Public Involvement Notifications).
- Providing those customers or the public who did not have access to SRA website a copy of the draft plan at their request.
- Providing written notice to the public on the draft plan and the public meeting on the draft plan (see Appendix C – DCP Public Involvement Notifications).

SRA provided the opportunity for the public and its wholesale water customers to suggest input into this revision of the DCP by means of the Sabine Basin Steering Committee meetings which were conducted in April 2009 as part of the Texas Clean Rivers Program. The Sabine Basin Steering Committee is comprised of over 140 members from entities and interested parties throughout the Sabine Basin. These Steering Committee meetings were held on consecutive business days in the upper, middle, and lower Basin. In addition, the current version of SRA's Water Conservation and Drought Contingency Plan (of which this DCP is a part) is available to the public on SRA's Water Conservation Webpage.¹³

4.3 Wholesale Water Customer Education

Wholesale water customer education was provided through the public involvement meetings described in the previous section and through SRA's Water Conservation Webpage. In addition, *Section 3.9.1* of SRA's Water Conservation and Drought Contingency Plan (of which this DCP is a part) outlines the overall education program of SRA.

4.4 Coordination with Regional Water Planning Groups (RWPG)

The water service area of SRA is located within portions of the Senate Bill 1 East Texas Regional Water Planning Area (Region I), the North East Texas Regional Water Planning Area (Region D), and Region C. SRA will provide a copy of the final adopted DCP to the RWPGs.

¹³ http://www.sratx.org/basin/water_conservation/, referenced 2/23/09.

4.5 Authorization

The General Manager of SRA (General Manager), as approved by the SRA Board of Directors, is authorized to implement the applicable provisions of this DCP upon determination that implementation is necessary to protect public health, safety, and welfare. The General Manager has the authority to initiate or terminate drought or other water supply emergency response measures as described in this DCP.

4.6 Application

The provisions of the DCP apply to all wholesale customers using water provided by SRA with the limited exception of those customers served under the contract with DWU, as further explained below. As a term of contract renewal, SRA is now requiring its customers to adopt this DCP and to create specific water conservation and drought contingency plans for their respective retail systems. Additionally, the contracts require that the locally developed plans must be at least as stringent as the adopted SRA plan.

The only exception to these provisions is for the contract with DWU. The DWU system serves both retail and wholesale customers and is covered by a separate and independent DCP that was developed by DWU for its entire system. As a result of the size and complexity of the DWU system and as a result of the availability of multiple sources of water supply for this system, it is more appropriate that DWU operate under a separate DCP for its entire system. To this end, SRA and DWU maintain a monthly accounting plan that allows computation of the individual diversions and the resulting storage allocation within Lake Tawakoni and Lake Fork Reservoirs for each of the two individual entities. Consequently, the criteria and actions required during drought conditions, including the goals for reduced diversions, are applied independently for SRA and DWU based on their respective storage allocations. The following criteria and actions required for drought response stages as outlined below are therefore only applicable to SRA customers other than DWU.

4.7 Criteria and Actions Required for Drought Response Stages for Iron Bridge and Lake Fork Divisions

The General Manager will monitor water supply conditions on a monthly basis and when conditions warrant, initiate or terminate each stage of the DCP and will implement the following described actions. Customer notification of the initiation or termination of drought response stages will be made by mail, telephone, email, and/or SRA's website. The news media will also be informed.

The triggering criteria for the Iron Bridge and Lake Fork Divisions described below are based on technical memorandum from AECOM to SRA – *Planning and Analysis for Water Availability, Water Conservation and Drought Contingency*, dated July 13, 2009. This technical study evaluated SRA's water supply system, water contracts, the drought of record, and historical meteorological conditions for the basin, simulated Sabine Water Availability Model runs, and recommended trigger conditions for each water supply system. These recommended triggers have been incorporated into this plan.

Lake Tawakoni and Lake Fork Reservoirs will be operated as a combined system for the SRA DCP. Therefore, the drought triggers will take effect when SRA's allocation of combined storage¹⁴ in both reservoirs falls below the trigger criteria identified below. The SRA portion of the reservoir storage for Lake Fork and Lake Tawakoni will be computed using the operational accounting plan adopted by both SRA and DWU. This accounting plan records monthly inflows, releases, net rainfall/evaporation, and reported diversions. Through use of this accounting plan, the storage remaining at the end of each month

¹⁴ Lake Tawakoni storage volume is based on 1997 TWDB volumetric survey (http://www.twdb.state.tx.us/hydro_survey/tawakoni/TawakoniRPT.pdf). Lake Fork storage volume is based on 2001 TWDB volumetric survey (http://www.twdb.state.tx.us/hydro_survey/Fork2001/).

for SRA and DWU can be computed appropriately and each entity can use these monthly values to independently implement required actions within the respective DCPs for each entity.

As outlined in more detail in the report sections below for the Iron Bridge and Lake Fork Divisions, Table 7 summarizes the drought triggers for successively more severe drought stages and corresponding reduction targets for diversions under these drought response stages.

Table 7 Summary of Drought Triggers and Diversion Reduction Goals for Iron Bridge and Lake Fork Divisions

Drought Stage	Drought Trigger: Percent of Combined Reservoir Storage Allocation for SRA*	Drought Trigger: Combined Reservoir Storage Allocation for SRA (ac-ft)	Drought Response: Diversion Reduction Target**
1- Mild	65%	239,504	4,000 ac-ft/yr (~4%)
2- Moderate	55%	202,657	6,000 ac-ft/yr (~6%)
3- Severe	45%	165,810	8,000 ac-ft/yr (~8%)
4- Critical	30%	110,540	10,000 ac-ft/yr (~10%)
5- Emergency***	Time in Stage 4 > 6 mo	N/A	General Mgr Decision

* The drought stages take effect when the SRA allocation of combined storage in Lake Tawakoni and Lake Fork falls to and remains at or below the trigger level for fourteen consecutive days

** Reduction target percentages are based on the total SRA permanent contracted amount of 102,992 ac-ft/yr for Lake Tawakoni and Lake Fork.

***Stage 5 is not triggered on the combined reservoir storage remaining, but on the length of time the storage is below 30%. This is an extreme condition during which the General Manager will determine the drought response based on reservoir conditions and need.

Based on the 1997 TWDB volumetric survey of Lake Tawakoni, its storage volume at the conservation pool elevation of 437.5 ft is 888,137 ac-ft. SRA's allocation of Lake Tawakoni storage is 177,627 ac-ft (20%). Based on the 2001 TWDB volumetric survey of Lake Fork, its storage volume at the conservation pool elevation of 403.0 ft is 636,133 ac-ft. SRA's allocation of Lake Fork storage is 190,840 ac-ft (30%). Therefore, SRA's allocation of the combined storage in Lake Fork and Lake Tawakoni totals to 368,467 ac-ft.

4.7.1 Stage 1 – Mild Water Shortage Conditions

4.7.1.1 Requirement for initiation

SRA will recognize that *mild water shortage conditions* exist in the service areas of the Lake Fork and Iron Bridge Divisions when:

- SRA's allocation of the combined storage in Lake Tawakoni and Lake Fork falls to and remains at or below 65% of the full storage allocation for fourteen consecutive days (65% of SRA's allocation of combined Lake Fork and Lake Tawakoni storage is 239,504 ac-ft).

4.7.1.2 Requirements for termination

Termination of the mild water shortage condition and corresponding measures will take place when conditions that initiated the mild water shortage condition no longer exist. Conditions are no longer considered to exist when SRA's allocation of the combined storage in Lake Tawakoni and Lake Fork remains above the drought trigger for fourteen consecutive days. SRA will inform its customers and the news media of the termination of mild water shortage conditions in the same manner as in its initiation.

4.7.1.3 Goal

Achieve a 4,000 ac-ft/yr reduction of total annual diversions, or an average monthly amount of 333 ac-ft. Based on SRA's permanent contract amount of 102,992 ac-ft/yr, this amounts to an approximately 4% reduction goal.

4.7.1.4 Measures

- 1) When mild water shortage conditions exist, the allowable contract diversion amount will be reduced until the required diversion goal is achieved by first reducing from interim contract/s and, if these contract/s are not sufficient to achieve the reduction goal, by then applying proportionate reductions on the contract amounts of permanent long-term water contract holders.
- 2) During drought conditions, no increased diversions will be allowed for any SRA customer above maximum historical usage unless approved by the General Manager for specific identified purposes.
- 3) SRA will inform its customers of the drought condition by mail, telephone, email, or SRA's website.
- 4) Customers will be asked to activate an appropriate system for answering inquiries from the citizens. Each customer entity in turn will follow its individual measures for the water shortage condition. At the same time, representatives of SRA and its customers will initiate discussion of the drought condition and its impact on the water supply situation with the news media.
- 5) SRA will notify the TCEQ Executive Director within five business days of implementing any mandatory provisions of the DCP.

4.7.2 Stage 2 – Moderate Water Shortage Conditions

4.7.2.1 Requirement for initiation

SRA will recognize that *moderate water shortage conditions* exist in the service areas of the Lake Fork and Iron Bridge Divisions when:

- SRA's allocation of the combined storage in Lake Tawakoni and Lake Fork falls to and remains at or below 55% of the full storage allocation for fourteen consecutive days (55% of SRA's allocation of combined Lake Fork and Lake Tawakoni storage is 202,657 ac-ft).

4.7.2.2 Requirements for termination

Termination of the moderate water shortage condition and corresponding measures will take place when conditions that initiated the moderate water shortage condition no longer exist. Conditions are no longer considered to exist when SRA's allocation of the combined storage in Lake Tawakoni and Lake Fork remains above the drought trigger for fourteen consecutive days. SRA will inform its customers and the news media of the termination of moderate water shortage conditions in the same manner as in its initiation.

4.7.2.3 Goal

Achieve a 6,000 ac-ft/yr reduction of total annual diversions, or an average monthly amount of 500 ac-ft. Based on SRA's permanent contract amount of 102,992 ac-ft/yr, this amounts to an approximately 6% reduction goal.

4.7.2.4 Measures

- 1) When moderate water shortage conditions exist, the allowable contract diversion amount will be reduced until the required diversion goal is achieved by first reducing from interim contract/s and, if these contract/s are not sufficient to achieve the reduction goal, by then applying proportionate reductions on the contract amounts of permanent long-term water contract holders.
- 2) During drought conditions, no increased diversions will be allowed for any SRA customer above maximum historical usage unless approved by the General Manager for specific identified purposes.
- 3) SRA will inform its customers by mail, telephone, email, or SRA's website that the drought has reached the moderate trigger level. This information will be given at weekly intervals as long as moderate water shortage conditions continues.
- 4) SRA will notify the TCEQ Executive Director within five business days of implementing any mandatory provisions of the DCP.

4.7.3 Stage 3 – Severe Water Shortage Conditions

4.7.3.1 Requirements for initiation

SRA will recognize that *severe water shortage conditions* exist in the service areas of the Lake Fork and Iron Bridge Divisions when:

- SRA's allocation of the combined storage in Lake Tawakoni and Lake Fork falls to and remains at or below 45% of the full storage allocation for fourteen consecutive days (45% of SRA's allocation of the combined Lake Fork and Lake Tawakoni storage is 165,810 ac-ft).

4.7.3.2 Requirements for termination

Termination of the severe water shortage condition and corresponding measures will take place when conditions that initiated the severe water shortage condition no longer exist. Conditions are no longer considered to exist when SRA's allocation of the combined storage in Lake Tawakoni and Lake Fork remains above the drought trigger for fourteen consecutive days. SRA will inform its customers and the news media of the termination of severe water shortage conditions in the same manner as in its initiation.

4.7.3.3 Goal

Achieve an 8,000 ac-ft/yr reduction of total annual diversions, or an average monthly amount of 667 ac-ft. Based on SRA's permanent contract amount of 102,992 ac-ft/yr, this amounts to an approximately 8% reduction goal.

4.7.3.4 Measures

- 1) When severe water shortage conditions exist, the allowable contract diversion amount will be reduced until the required diversion goal is achieved by first reducing from interim

contract/s and, if these contract/s are not sufficient to achieve the reduction goal, by then applying proportionate reductions on the contract amounts of permanent long-term water contract holders.

- 2) During drought conditions, no increased diversions will be allowed for any SRA customer above maximum historical usage unless approved by the General Manager for specific identified purposes.
- 3) When severe water shortage conditions exist, SRA will inform its customers by mail, telephone, email, or SRA's website about the serious water supply situation. The news media also will be informed. Situation reports will be issued to SRA's customers and the news media weekly. SRA management may call emergency meetings to discuss with its customers major operational changes if it finds such action necessary during the progress of a severe drought.
- 4) SRA will notify the TCEQ Executive Director within five business days of implementing any mandatory provisions of the DCP.

4.7.4 Stage 4 - Critical Water Shortage Conditions

4.7.4.1 Requirements for initiation

SRA will recognize that *critical water shortage conditions* exist in the appropriate part(s) of its system when:

- SRA's allocation of the combined storage in Lake Tawakoni and Lake Fork falls to and remains at or below 30% of the full storage allocation for fourteen consecutive days (30% of SRA's allocation of the combined Lake Fork and Lake Tawakoni storage is 110,540 ac-ft).

4.7.4.2 Requirements for termination

Termination of the critical water shortage condition and corresponding measures will take place when conditions that initiated the critical water shortage condition no longer exist. Conditions are no longer considered to exist when SRA's allocation of the combined storage in Lake Tawakoni and Lake Fork remains above the drought trigger for fourteen consecutive days. SRA will inform its customers and the news media of the termination of critical water shortage conditions in the same manner as in its initiation.

4.7.4.3 Goal

Achieve a 10,000 ac-ft/yr reduction of total annual diversions, or an average monthly amount of 833 ac-ft. Based on SRA's permanent contract amount of 102,992 ac-ft/yr, this amounts to an approximately 10% reduction goal.

4.7.4.4 Measures

- 1) When critical water shortage conditions exist, the allowable contract diversion amount will be reduced until the required diversion goal is achieved by first reducing from interim contract/s and, if these contract/s are not sufficient to achieve the reduction goal, by then applying proportionate reductions on the contract amounts of permanent long-term water contract holders.
- 2) During drought conditions, no increased diversions will be allowed for any SRA customer above maximum historical usage unless approved by the General Manager for specific identified purposes.

- 3) SRA will request its municipal customers to prohibit all outdoor water use (except for livestock watering) and to activate applicable drought measures to minimize indoor uses until the drought condition changes to a Stage 3 (Severe) condition or better.
- 4) When critical water shortage conditions exist, SRA will inform its customers by mail, telephone, email, or SRA's website about the critical water shortage situation. The news media also will be informed. Situation reports will be issued to SRA's customers and the news media weekly. SRA management may call emergency meetings to discuss with its customers major operational changes if it finds such action necessary during the progress of a critical drought.
- 5) SRA will notify the TCEQ Executive Director within five business days of implementing any mandatory provisions of the DCP.

4.7.5 Stage 5 – Emergency Water Shortage Conditions (related to drought)

4.7.5.1 Requirements for initiation

SRA will recognize that *emergency water shortage conditions (related to drought)* exist in the appropriate part(s) of its system when:

- SRA's allocation of the combined storage in Lake Tawakoni and Lake Fork falls to and remains at or below 30% of the full storage allocation for six consecutive months (30% of SRA's allocation of the combined Lake Fork and Lake Tawakoni storage is 110,540 ac-ft).

4.7.5.2 Requirements for termination

Termination of the emergency water shortage condition (related to drought) and corresponding measures will take place when conditions that initiated the critical water shortage condition (Stage 4) no longer exist. Conditions are no longer considered to exist when SRA's allocation of the combined storage in Lake Tawakoni and Lake Fork remains above the Stage 4 drought trigger for fourteen consecutive days. SRA will inform its customers and the news media of the termination of emergency water shortage conditions (related to drought) in the same manner as in its initiation.

4.7.5.3 Goal

Reduce delivery as appropriate to alleviate the emergency condition.

4.7.5.4 Measures

- 1) When emergency water shortage conditions (related to drought) exist, the General Manager, on a monthly basis, will determine the allowable monthly diversion for each customer based on need and the condition of the reservoirs. The allowable contract diversion amount will be reduced as necessary to address the emergency condition by first reducing from interim contract/s and, if these contract/s are not sufficient to address the emergency, by then applying proportionate reductions on the contract amounts of permanent long-term water contract holders.
- 2) SRA may reduce water delivery to its customers as the situation dictates. This is further discussed in **WATER ALLOCATION** (Section 4.9).
- 3) When emergency water shortage conditions (related to drought) exist, SRA will inform its customers by mail, telephone, email, or SRA's website about the emergency water supply situation. The news media also will be informed. Situation reports will be issued to

SRA's customers and the news media as frequently as the emergency condition dictates. SRA management may call emergency meetings to discuss with its customers major operational changes if it finds such action necessary during the progress of the water shortage condition.

- 4) SRA will prohibit all non-essential outdoor water use and activate applicable drought measures to minimize indoor uses until the drought condition changes to a Stage 3 (Severe) condition or better.
- 5) SRA will notify the TCEQ Executive Director within five business days of implementing any mandatory provisions of the DCP.

4.7.6 Emergency Water Shortage Conditions (not related to drought)

4.7.6.1 Requirements for initiation

SRA will recognize that *emergency water shortage conditions (not related to drought)* exist in the appropriate part(s) of its system when:

- There is a major contamination or a required drawdown of Lake Tawakoni or Lake Fork Reservoir for emergency repairs of major infrastructure, or
- there is a failure or breakdown of a major component of the pumps or delivery system that significantly impacts the supply of water to SRA's customers.

4.7.6.2 Requirements for termination

Termination of the emergency water shortage condition (not related to drought) and corresponding measures will take place when conditions that initiated the emergency water shortage condition no longer exist and the system delivery capacity is returned to normal. SRA will inform its customers and the media of the termination of the emergency water shortage conditions in the same manner as in its initiation.

4.7.6.3 Goal

Reduce delivery as appropriate to address the emergency condition.

4.7.6.4 Measures

- 1) When emergency water shortage conditions exist, SRA will inform its customers by mail, telephone, email, or SRA's website about the emergency water supply situation. The news media also will be informed. Situation reports will be issued to SRA's customers and the news media as frequently as the emergency condition dictates. SRA management may call emergency meetings to discuss with its customers major operational changes if it finds such action necessary during the progress of the water shortage condition.
- 2) SRA may request its customers to prohibit all non-essential water use including outdoor water use (except for livestock watering) and to activate applicable water shortage measures to minimize indoor uses until the emergency water shortage condition is resolved.
- 3) SRA may reduce water delivery to its customers as the situation dictates. This is further discussed in **WATER ALLOCATION** (Section 4.9).

- 4) SRA will notify the TCEQ Executive Director within five business days of implementing any mandatory provisions of the DCP.

4.8 Criteria and Actions Required for Drought Response Stages for Toledo Bend and Gulf Coast Divisions

The triggering criteria for the Toledo Bend and Gulf Coast Division described below are based on the recommendations outlined in an engineering technical memorandum from TCB | AECOM (currently AECOM) to Sabine River Authority - *Drought Contingency Triggers Review and Recommendations* dated June 22, 2006. This technical study evaluated SRA’s water supply system, water contracts, and historical meteorological conditions for the basin and recommended trigger conditions for each water supply system. These recommended triggers have been updated and incorporated into this plan.

The General Manager will monitor water supply conditions on a monthly basis and when conditions warrant, initiate or terminate each stage of the DCP and will implement the following described actions. Customer notification of the initiation or termination of drought response stages will be made by mail, telephone, email, and/or SRA’s website. The news media will also be informed.

As outlined in more detail in the report sections below for the Toledo Bend Division, Table 8 summarizes the drought triggers for successively more severe drought stages and corresponding water use reduction targets under these drought response stages.

Table 8 Summary of Drought Triggers and Diversion Reduction Goals for the Toledo Bend Division

Drought Stage	Drought Trigger: Water Surface Elevation (ft)*	Drought Response: Water Use Reduction Target
1- Mild	165.1	Voluntary
2- Moderate	162.2	10%
3- Severe	156	20%

* The drought stages take effect when the water surface elevation in Toledo Bend falls to and remains at or below the trigger levels for fourteen consecutive days.

4.8.1 Stage 1 – Mild Water Shortage Conditions

4.8.1.1 Requirement for initiation

SRA will recognize that *mild water shortage conditions* exist in the appropriate part(s) of its system when:

- The water surface elevation in Toledo Bend falls to and remains at or below 165.1 feet for fourteen consecutive days, or
- The flow measured by the U.S. Geological Survey (USGS) gage on the Sabine River near Ruliff, Texas, falls to and remains at or below the mild conditions flow in Table 9 for fourteen consecutive days. The trigger flow at the Ruliff gage depends on the amount of water SRA is contracted to deliver.

4.8.1.2 Requirements for termination

Termination of the mild water shortage condition and corresponding measures will take place when conditions that initiated the mild water shortage condition no longer exist. Conditions are no longer

considered to exist when the Toledo Bend elevation remains above the drought trigger for fourteen consecutive days or the USGS gage near Ruliff remains above the mild conditions flow in Table 9 for fourteen consecutive days. SRA will inform its customers and the news media of the termination of the mild water shortage conditions in the same manner as in its initiation.

4.8.1.3 Goal

Inform SRA's customers and the general public of the situation and encourage voluntary water use reductions.

4.8.1.4 Measures

- 1) When mild water shortage conditions exist, SRA will inform its customers of the drought condition by mail, telephone, email, or SRA's website. SRA will continue to advise its customers of the Toledo Bend Reservoir elevation and river level at the USGS gage near Ruliff every business day on the SRA website.¹⁵
- 2) Customers will be asked to activate an appropriate system for answering inquiries from the citizens. Each customer entity in turn will follow its individual measures for mild water shortage conditions. At the same time, representatives of SRA and its customers will initiate discussion of the drought condition and its impact on the water supply situation with the news media.

4.8.2 Stage 2 – Moderate Water Shortage Conditions

4.8.2.1 Requirement for initiation

SRA will recognize that *moderate water shortage conditions* exist in the appropriate part(s) of its system when:

- The water surface elevation in Toledo Bend falls to and remains at or below 162.2 feet for fourteen consecutive days, or
- the flow measured by the USGS gage on the Sabine River near Ruliff, Texas, falls to and remains at or below the moderate conditions flow in Table 9 for fourteen consecutive days. The trigger flow at the Ruliff gage depends on the amount of water SRA is contracted to deliver.

4.8.2.2 Requirements for termination

Termination of the moderate water shortage condition and corresponding measures will take place when conditions that initiated the moderate water shortage condition no longer exist. Conditions are considered to no longer exist when the water surface elevation of Toledo Bend remains above the drought trigger for fourteen consecutive days or the flow measured by the USGS gage near Ruliff remains above the moderate conditions flow in Table 9 for fourteen consecutive days. SRA will inform its customers and the media of the termination of the moderate water shortage conditions in the same manner as in its initiation.

4.8.2.3 Goal

Achieve a 10 percent reduction in total water use through implementing reductions in non-essential outdoor water use.

¹⁵ http://www.sratx.org/basin/lake_and_river_conditions.asp, referenced 2/17/2005.

4.8.2.4 Measures

- 1) When moderate water shortage conditions exist, SRA will inform its customers by mail, telephone, email, or SRA's website that the drought has reached the moderate trigger level. This information will be given at weekly intervals as long as the moderate drought condition continues. SRA will continue to advise its customers of the Toledo Bend Reservoir elevation and river level at the USGS gage near Ruliff every business day on the SRA website.
- 2) During the moderate water shortage conditions, SRA may curtail water delivered to its customers, if necessary. The General Manager shall establish the methodology for determining curtailment of the water delivery. See **WATER ALLOCATION** (Section 4.9).
- 3) Using the news media or direct contact, SRA may request its customers to prohibit non-essential outdoor uses such as lawn irrigation, vehicle washing, filling of swimming pools, or routine maintenance of facilities.
- 4) SRA will notify the TCEQ Executive Director within five business days of implementing any mandatory provisions of the DCP.

4.8.3 Stage 3 – Severe Water Shortage Conditions

4.8.3.1 Requirements for initiation

SRA will recognize that *severe water shortage conditions* exist in the appropriate part(s) of its system when:

- The water surface elevation in Toledo Bend falls to and remains at or below 156 feet for fourteen consecutive days, or
- the flow measured by the USGS gage on the Sabine River near Ruliff, Texas, falls to the severe conditions flow in Table 9 for fourteen consecutive days. The trigger flow at the Ruliff gage depends on the amount of water SRA is contracted to deliver.

4.8.3.2 Requirements for termination

Termination of the severe water shortage condition and corresponding measures will take place when conditions that initiated the severe water shortage condition no longer exist. Conditions are no longer considered to exist when the Toledo Bend elevation remains above the drought trigger for fourteen consecutive days or the USGS gage near Ruliff remains above the severe conditions flow in Table 9 for fourteen consecutive days. SRA will inform its customers and the news media of the termination of the severe water shortage conditions in the same manner as in its initiation.

Table 9 Gulf Coast Division Drought Trigger Conditions

Contracted Diversion (ac-ft/yr)	Contracted Diversion (cfs)	Minimum Ruliff Flows for Diversion (cfs)	Trigger Flow at Ruliff Gage		
			Mild Conditions (cfs)	Moderate Conditions (cfs)	Severe Conditions (cfs)
50,000	69	173	260	216	173
60,000	83	208	312	260	208
70,000	97	243	365	304	243
80,000	111	278	417	348	278
90,000	124	310	465	388	310
100,000	138	345	518	431	345
110,000	152	380	570	475	380
120,000	166	415	623	519	415
130,000	180	450	675	563	450
140,000	193	483	725	604	483
147,100	203	508	762	635	508

NOTE The minimum flow required at Ruliff to allow the contracted diversion was calculated by multiplying the contracted diversion (in cfs) by 2.5. The following assumptions were used in determining the multiplication factor:

- i) Only half the flow downstream of the gage flows on the Texas side.
- ii) At least 20% of the flow on the Texas side flows past the canal intake structure.
- iii) The mild drought trigger flow is 1.5 times the minimum; the moderate drought trigger flow is 1.25 times the minimum; the severe drought trigger flow is the minimum flow required to allow the contracted diversion.

4.8.3.3 Goal

Achieve a 20 percent reduction in total water use.

4.8.3.4 Measures

- 1) When severe water shortage conditions exist, SRA will inform its customers by mail, telephone, email, or SRA’s website about the serious water supply situation. The news media also will be informed. Situation reports will be issued to SRA’s customers and the news media weekly. SRA management may call emergency meetings to discuss with its customers major operational changes if it finds such action necessary during the progress of a severe drought. SRA will continue to advise its customers of the Toledo Bend Reservoir elevation and river level at the USGS gage near Ruliff every business day on the SRA website.
- 2) SRA may request its customers prohibit all outdoor water use (except for livestock watering) and to activate applicable drought measures to reduce indoor uses until the drought condition changes to a moderate condition or better.
- 3) SRA may reduce water delivery to its customers as the situation dictates. This is further discussed in **WATER ALLOCATION** (Section 4.9).

- 4) SRA will notify the TCEQ Executive Director within five business days of implementing any mandatory provisions of the DCP.

4.8.4 Emergency Water Shortage Conditions (not related to drought)

4.8.4.1 Requirements for initiation

SRA will recognize that *emergency water shortage conditions* exist in the appropriate part(s) of its system when:

- There is a major contamination or a major required drawdown of Toledo Bend for emergency repairs of major infrastructure, or
- the failure of a major component of the pumps or canals in the John W. Simmons Gulf Coast Canal System significantly impacts the supply of water to its customers.

4.8.4.2 Requirements for termination

Termination of the emergency water shortage condition and corresponding measures will take place when conditions that initiated the emergency water shortage condition no longer exist. Conditions are considered to no longer exist when Toledo Bend repairs are made and the reservoir is returning to normal water surface elevation levels, or the repair of any failed equipment is completed and Canal System delivery capacity is returned to normal. SRA will inform its customers and the media of the termination of the emergency water shortage conditions in the same manner as in its initiation.

4.8.4.3 Goal

Reduce delivery as appropriate to address the emergency condition.

4.8.4.4 Measures

- 1) When emergency water shortage conditions exist, SRA will inform its customers by mail, telephone, email, or SRA's website about the water supply situation. The news media also will be informed. Situation reports will be issued to SRA's customers and the news media weekly. SRA management may call emergency meetings to discuss with its customers major operational changes if it finds such action necessary during the progress of the emergency water shortage condition. SRA will continue to advise its customers of the Toledo Bend Reservoir elevation and river level at the USGS gage near Ruliff every business day on the SRA website.
- 2) SRA will request its customers prohibit all outdoor water use (except for livestock watering) and to activate applicable measures to minimize indoor uses until the emergency water shortage condition is terminated.
- 3) SRA may reduce water delivery to its customers as the situation dictates. This is further discussed in **WATER ALLOCATION** (Section 4.9).
- 4) SRA will notify the TCEQ Executive Director within five business days of implementing any mandatory provisions of the DCP.
- 5) Specific to the John W. Simmons Gulf Coast Canal System, a supply restriction resulting from pump or canal failure will tend to be of short duration; but in the event of an emergency condition, SRA will notify its customers of the water supply situation and make such operational changes it finds necessary while the emergency condition exists.

Customers will be notified when the situation has been rectified and the system is fully operational.

4.9 Water Allocation

In the event that the trigger criteria specified in the DCP have been met, the General Manager is authorized to initiate all appropriate measures including reductions in the allocation of diversions to achieve the goals of the required drought stage in accordance with Texas Water Code Section 11.039 and with the water allocation policies and procedures defined herein. When water allocation is in effect, water diversions by or deliveries to each wholesale customer shall be limited to the monthly allocation established for each customer during the designated drought condition unless explicitly modified by the General Manager through a variance request by the customer as outlined in Section 4.11 below.

4.10 Enforcement

During any period when allocation of available water supplies is in effect, wholesale customers shall pay the following surcharges on excess water diversions and/or deliveries:

- **Five** times the normal water charge per acre-foot for water diversions and/or deliveries in excess of the monthly allocation up through 5 percent above the monthly allocation.
- **Ten** times the normal water charge per acre-foot for water diversions and/or deliveries in excess of the monthly allocation from 5 percent through 10 percent above the monthly allocation.
- **Twenty Five** times the normal water charge per acre-foot for water diversions and/or deliveries in excess of the monthly allocation from 10 percent through 15 percent above the monthly allocation.
- **Fifty** times the normal water charge per acre-foot for water diversions and/or deliveries more than 15 percent above the monthly allocation.

The above surcharges shall be cumulative. Upper Basin customers (Lake Tawakoni and Lake Fork) will also be subject to the surcharges if they divert in excess of their historic maximum usage during any drought stages unless approved by the General Manger.

4.11 Variances

The General Manager, or designee, may, in writing, grant a temporary variance to water allocation policies provided by this DCP if it is determined that failure to grant such variance would cause an emergency condition adversely affecting the public health, welfare, or safety and if one or more of the following conditions are met:

- (a) Compliance with this DCP cannot be technically accomplished during the duration of the water supply shortage or other condition for which the DCP is in effect.
- (b) Alternative methods can be implemented which will achieve the same level of reduction in water use.

An entity requesting an exemption from the provisions of this DCP shall file a petition for variance with the General Manager within 5 days after water allocation has been invoked. All petitions for variances shall be reviewed by the General Manager, and shall include the following:

- (a) Name and address of the petitioner(s).

- (b) Detailed statement with supporting data and information as to how the allocation of water under the policies and procedures established in the DCP adversely affects the petitioner or what damage or harm will occur to the petitioner or others if petitioner complies with this DCP.
- (c) Description of the relief requested.
- (d) Period of time for which the variance is sought.
- (e) Alternative measures the petitioner is taking or proposes to take to meet the intent of this DCP and the compliance date.
- (f) Other pertinent information.

Variations granted by the General Manager shall be subject to the following conditions, unless waived or modified by the General Manager or designee:

- (a) Variations granted shall include a timetable for compliance.
- (b) Variations granted shall expire when the DCP 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 DCP occurring prior to the issuance of the variance.

4.12 Severability

It is hereby declared to be the intention of the SRA Board of Directors that the sections, paragraphs, sentences, clauses, and phrases of this DCP are severable and, if any phrase, clause, sentence, paragraph, or section of this DCP shall be declared unconstitutional by the valid judgment or decree of any court of competent jurisdiction, such unconstitutionality shall not affect any of the remaining phrases, clauses, sentences, paragraphs, and sections of this DCP, since the same would not have been enacted by the Board without the incorporation into this DCP of any such unconstitutional phrase, clause, sentence, paragraph, or section.

4.13 Drought Contingency Plan Update Schedule

In accordance with TAC Rule §288.30 (6), SRA will continue to review and update this DCP every five years hereafter to coincide with the planning cycle of the State's Regional Water Planning Groups within SRA's service area.

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Appendices

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Appendix A - SRA Board Resolution Adopting Conservation and Drought
Contingency Plan

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RESOLUTION NO. 601

A RESOLUTION OF THE BOARD OF DIRECTORS
ADOPTING A WATER CONSERVATION AND DROUGHT CONTINGENCY PLAN
FOR
THE SABINE RIVER AUTHORITY OF TEXAS

WHEREAS, the Board of Directors recognizes that the amount of water available to the Sabine River Authority of Texas (SRA) and to its wholesale water customers is limited and subject to depletion during periods of extended drought; and,

WHEREAS, the Board of Directors recognizes that natural limitations due to drought conditions and other acts of God cannot guarantee an uninterrupted water supply for all purposes; and,

WHEREAS, Section 11.1271 of the Texas Water Code and applicable rules of the Texas Commission on Environmental Quality require all water rights holders in Texas to prepare a water conservation plan; and,

WHEREAS, Section 11.1272 of the Texas Water Code and applicable rules of the Texas Commission on Environmental Quality require all public water supply systems in Texas to prepare a drought contingency plan; and

WHEREAS, Section 11.039 of the Texas Water Code authorizes water suppliers to adjust the allocation of available water supplies during times of water supply shortage; and

WHEREAS, as authorized under law, and in the best interests of the customers of SRA, the Board of Directors deems it expedient and necessary to establish certain rules and policies for the orderly and efficient management of limited water supplies during drought and other water supply emergencies.

NOW THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF THE SABINE RIVER AUTHORITY OF TEXAS:

SECTION 1. That the Water Conservation and Drought Contingency Plan attached hereto as Exhibit "A" is hereby adopted as the official policy of the Sabine River Authority of Texas.

SECTION 2. That the Management, Staff, and Employees of the Sabine River Authority of Texas are hereby directed to implement, administer, and enforce the Water Conservation and Drought Contingency Plan.

SECTION 3. That this resolution shall take effect immediately upon its passage.

UNANIMOUSLY ADOPTED BY THE BOARD OF DIRECTORS OF THE SABINE RIVER AUTHORITY OF TEXAS ON THIS 8th DAY OF OCTOBER 2009.



Connie Wade
President, Board of Directors

ATTEST TO:



Secretary/Treasurer, Board of Directors

APPROVED



Jerry Clark
Executive Vice President
and General Manager

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Appendix B - Sources and Method for Calculation of Current and Projected Population

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The Sabine River Authority (SRA) service area population, the Sabine Basin in Texas plus out-of-Basin customers, was calculated using a Geographic Information System (GIS) distribution of the Year 2000 US Census block data (Table 10). TWDB 2006 Regional Water Plan 2000-2060 County Population Projections data (Table 11) was used to project future populations for counties that were split by, or fully within, the Basin boundary (Table 13). The published projections by county for each decade (Table 11) were expressed as a ratio of the 2000 census count (Table 12) and applied as multipliers to the GIS-calculated portion of the population for that county within the Sabine Basin.

Population projections for water customers outside of the Sabine Basin boundary and for the current municipal customers inside the Basin (current raw water customers) (Table 1) were taken directly from the published TWDB 2006 Regional Water Plan 2000-2060 City Population Projections data (Table 14, Table 15). Note that totals for Basin-wide populations were combined with totals for out-of-Basin municipal customers to estimate SRA's service area population.

Table 10 Population Data for Counties at Least Partially within the Sabine Basin, Texas (2000 census)

COUNTY NAME	Entire County	Sabine Basin Portion Only
	(P2000 Census)	(SRA GIS)
COLLIN	491,774	3,455
FRANKLIN	9,458	307
GREGG	111,379	107,821
HARRISON	62,110	40,432
HOPKINS	31,960	7,069
HUNT	76,596	62,528
JASPER	35,604	13,513
KAUFMAN	71,313	2,085
NEWTON	15,072	15,072
ORANGE	84,966	56,364
PANOLA	22,756	22,697
RAINS	9,139	9,139
ROCKWALL	43,080	4,847
RUSK	47,372	23,245
SABINE	10,469	8,117
SAN AUGUSTINE	8,946	799
SHELBY	25,224	22,664
SMITH	174,706	28,538
UPSHUR	35,291	12,332
VAN ZANDT	48,140	26,285
WOOD	36,752	34,420
Total	1,452,107	501,729

Table 11 2006 Regional Water Plan County Population Projections for 2000 – 2060 for counties at least partially within the Sabine Basin, Texas

COUNTY NAME	P2000 Census	P2010	P2020	P2030	P2040	P2050	P2060
COLLIN	491,774	756,088	1,033,173	1,249,795	1,512,261	1,762,329	2,033,981
FRANKLIN	9,458	11,533	13,363	14,613	15,863	15,863	15,863
GREGG	111,379	118,770	126,421	134,330	143,481	155,871	173,587
HARRISON	62,110	67,547	72,930	76,824	79,759	83,191	88,241

COUNTY NAME	P2000 Census	P2010	P2020	P2030	P2040	P2050	P2060
HOPKINS	31,960	35,934	39,882	42,951	45,528	45,528	45,528
HUNT	76,596	82,948	94,401	110,672	137,371	196,757	289,645
JASPER	35,604	38,445	40,897	42,344	42,712	42,712	42,712
KAUFMAN	71,313	112,971	148,580	177,072	205,571	237,625	277,783
NEWTON	15,072	16,008	16,731	16,825	17,329	17,849	18,385
ORANGE	84,966	90,503	94,274	95,818	96,473	97,843	98,836
PANOLA	22756	23903	24402	24800	25141	25419	25600
RAINS	9,139	11,173	13,221	14,687	15,400	15,755	15,991
ROCKWALL	43,080	82,547	126,029	148,991	170,493	186,083	196,472
RUSK	47,372	49,874	52,241	53,585	54,255	56,120	60,705
SABINE	10,469	11,280	11,743	12,095	12,457	12,832	13,216
SAN AUGUSTINE	8,946	9,715	9,911	10,164	10,470	10,785	10,999
SHELBY	25,224	26,531	28,248	29,597	30,602	31,467	32,414
SMITH	174,706	194,223	208,737	223,251	237,766	262,454	295,252
UPSHUR	35,291	38,372	41,496	43,619	44,953	46,003	47,385
VAN ZANDT	48,140	55,423	63,079	69,539	74,392	80,547	87,414
WOOD	36,752	42,727	48,200	51,236	51,565	51,565	51,565
21-County Total	1,452,107	1,876,515	2,307,959	2,642,808	3,023,842	3,434,598	3,921,574

Table 12 Calculated Population Changes Expressed as a Multiplier

COUNTY NAME	P2010	P2020	P2030	P2040	P2050	P2060
COLLIN	1.5375	2.1009	2.5414	3.0751	3.5836	4.1360
FRANKLIN	1.2194	1.4129	1.5450	1.6772	1.6772	1.6772
GREGG	1.0664	1.1351	1.2061	1.2882	1.3995	1.5585
HARRISON	1.0875	1.1742	1.2369	1.2842	1.3394	1.4207
HOPKINS	1.1243	1.2479	1.3439	1.4245	1.4245	1.4245
HUNT	1.0829	1.2325	1.4449	1.7934	2.5688	3.7815
JASPER	1.0798	1.1487	1.1893	1.1996	1.1996	1.1996
KAUFMAN	1.5842	2.0835	2.4830	2.8827	3.3321	3.8953
NEWTON	1.0621	1.1101	1.1163	1.1497	1.1842	1.2198
ORANGE	1.0652	1.1095	1.1277	1.1354	1.1516	1.1632
PANOLA	1.0504	1.0723	1.0898	1.1048	1.1170	1.1250
RAINS	1.2226	1.4467	1.6071	1.6851	1.7239	1.7498
ROCKWALL	1.9161	2.9255	3.4585	3.9576	4.3195	4.5606
RUSK	1.0528	1.1028	1.1312	1.1453	1.1847	1.2815
SABINE	1.0775	1.1217	1.1553	1.1899	1.2257	1.2624
SAN AUGUSTINE	1.0860	1.1079	1.1362	1.1704	1.2056	1.2295
SHELBY	1.0518	1.1199	1.1734	1.2132	1.2475	1.2850
SMITH	1.1117	1.1948	1.2779	1.3609	1.5023	1.6900
UPSHUR	1.0873	1.1758	1.2360	1.2738	1.3035	1.3427
VAN ZANDT	1.1513	1.3103	1.4445	1.5453	1.6732	1.8158
WOOD	1.1626	1.3115	1.3941	1.4031	1.4031	1.4031

Calculated from the TWDB county population projections.

Table 13 Population Projections Adjusted for the Portion of each County within the Sabine Basin, Texas

COUNTY NAME	2000	P2010	P2020	P2030	P2040	P2050	P2060
COLLIN	3,455	5,312	7,259	8,781	10,625	12,381	14,290
FRANKLIN	307	374	434	474	515	515	515
GREGG	107,821	114,976	122,382	130,039	138,898	150,892	168,042
HARRISON	40,432	43,971	47,476	50,010	51,921	54,155	57,443
HOPKINS	7,069	7,948	8,821	9,500	10,070	10,070	10,070
HUNT	62,528	67,713	77,063	90,345	112,141	160,620	236,447
JASPER	13,513	14,591	15,522	16,071	16,211	16,211	16,211
KAUFMAN	2,085	3,303	4,344	5,177	6,010	6,948	8,122
NEWTON	15,072	16,008	16,731	16,825	17,329	17,849	18,385
ORANGE	56,364	60,037	62,539	63,563	63,997	64,906	65,565
PANOLA	22,697	23,841	24,339	24,736	25,076	25,353	25,534
RAINS	9,139	11,173	13,221	14,687	15,400	15,755	15,991
ROCKWALL	4,847	9,287	14,180	16,763	19,182	20,936	22,105
RUSK	23,245	24,473	25,634	26,294	26,622	27,538	29,787
SABINE	8,117	8,746	9,105	9,378	9,658	9,949	10,247
SAN AUGUSTINE	799	868	885	908	935	963	982
SHELBY	22,664	23,838	25,381	26,593	27,496	28,273	29,124
SMITH	28,538	31,726	34,097	36,468	38,839	42,872	48,229
UPSHUR	12,332	13,409	14,500	15,242	15,708	16,075	16,558
VAN ZANDT	26,285	30,262	34,442	37,969	40,619	43,980	47,729
WOOD	34,420	40,016	45,142	47,985	48,293	48,293	48,293
Sabine Basin County Total	501,729	551,872	603,495	647,808	695,546	774,534	889,669

Table 14 Population Projections for Municipal Raw Water Customers within the Sabine Basin Boundary

CITY NAME	P2000 Census	P2010	P2020	P2030	P2040	P2050	P2060
HEMPHILL	1,106	1,192	1,241	1,278	1,316	1,356	1,396
LONGVIEW	73,344	76,827	80,433	84,160	88,473	94,312	102,661
EDGEWOOD	1,348	1,394	1,442	1,483	1,513	1,552	1,595
KILGORE	11,301	11,823	12,363	12,921	13,567	14,442	15,693
QUITMAN	2,030	2,360	2,662	2,830	2,848	2,848	2,848
GREENVILLE	23,960	24,431	25,178	26,189	27,796	31,324	36,802
WEST TAWAKONI	1,462	1,663	1,859	2,004	2,169	2,344	2,519
WILLS POINT	3,496	3,860	4,243	4,566	4,809	5,117	5,460
EMORY	1,021	1,228	1,401	1,573	1,745	1,918	2,091
POINT	792	949	1,082	1,216	1,349	1,482	1,615
ABLE SPRINGS WSC	3,411	5,227	7,046	8,956	11,153	14,106	17,943
COMBINED CONSUMERS WSC	6,110	6,999	8,656	11,048	15,003	23,844	37,701
MAC BEE WSC	7,166	8,496	9,931	11,211	12,326	13,956	16,019
SOUTH TAWAKONI WSC	3,204	3,789	4,403	4,922	5,311	5,805	6,356
CASH WSC	12,984	15,059	18,631	23,517	31,337	48,471	75,244

CITY NAME	P2000 Census	P2010	P2020	P2030	P2040	P2050	P2060
Total	152,735	165,297	180,571	197,874	220,715	262,877	325,943

TWDB 2006 Regional Water Plan population projections for 2000 - 2060 for cities, utilities and county-other by county and region in Texas.

Table 15 Population Projections for Municipal Raw Water Customers Outside the Sabine Basin Boundary

CITY NAME	P2000 Census	P2010	P2020	P2030	P2040	P2050	P2060
DALLAS	1,188,580	1,312,324	1,451,878	1,525,450	1,598,223	1,764,681	2,058,767
COMMERCE	7,669	8,116	8,825	9,785	11,310	14,659	19,860
ROSE CITY	519	519	519	519	519	519	519
HENDERSON	11,273	11,358	11,438	11,484	11,506	11,570	11,726
NTMWD	1,004,160	1,467,601	1,872,137	2,192,587	2,497,191	2,757,973	3,022,282
Total	2,212,201	2,799,918	3,344,797	3,739,825	4,118,749	4,549,402	5,113,154

The City of Henderson lies on the Basin boundary. TWDB 2006 Regional Water Plan population projections for 2000 - 2060 for cities, utilities and county-other by county and region in Texas. NTMWD were obtained from the NTMWD Water Conservation and Drought Contingency and Water Emergency Response Plan (March 2008) and are based on the 2006 Region C RWP.

Appendix C – DCP Public Involvement Notifications

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The Sabine River Authority provided the opportunity for its wholesale water customers and the public to suggest input into this revision of the Water Conservation and Drought Contingency Plan by means of the Sabine Basin Steering Committee meetings which were conducted in April 2009 as part of the Texas Clean Rivers Program. The Sabine Basin Steering Committee is comprised of over 140 members from entities and interested parties throughout the Sabine Basin. These meetings were held on consecutive business days in the upper, middle, and lower Basin.

- Monday, April 20 at Orange, Texas
- Tuesday, April 21 at Longview, Texas
- Wednesday, April 22 at Greenville, Texas

Highlights of the Plan were presented at each of these meetings and the attendees were asked to submit comments by April 29th, 2009.