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Chapter 3 – Analysis of Current Water Supplies

3.1 Introduction

As presented in *Chapter 1*, groundwater resources in Region H consist of two major aquifers and four minor aquifers. The two major aquifers are the Gulf Coast aquifer and the Carrizo-Wilcox aquifer; four minor aquifers present are the Sparta, Queen City, Yegua-Jackson, and Brazos River alluvium aquifers.

Much of the regional water demand is supplied by surface water. Of the total year 2000 water demand over 70 percent, or 1,267,410 acre-feet, was supplied by surface water as found in the TWDB Year 2000 Water Use Survey. By 2004, surface water use reported to the TWDB increased to approximately 1,240,000 acre-feet, accounting for 70 percent of the total water used in Region H. Surface water supplies are obtained from the Lake Livingston-Wallisville Salt Water Barrier System on the Trinity River, Lake Conroe and Lake Houston on the San Jacinto River, the Brazos River Authority/U.S. Army Corps of Engineers (BRA/COE) System, ROR flows from the Trinity, Brazos, and San Jacinto Rivers, the corresponding coastal basins, and some smaller tributaries and reservoirs. Groundwater supplies the remaining 30 percent of the water.

This chapter summarizes the results of Task 3, and describes the resources available to the region and their allocation to Water User Groups (WUGs) throughout Region H. Also, to provide consistency and facilitate the compilation of the different regional plans, the Texas Water Development Board (TWDB) required the incorporation of this data into a standardized online database referred to as TWDB DB12. Tables that contain this information are identified below and are located in the appendices accompanying this chapter.

- *Appendix 3A* – Current Water Supply Sources Available During Drought of Record Conditions
- *Appendix 3H* – Current Water Supplies Available to Region H by City and Category
- *Appendix 3I* – Current Water Supplies Available to Region H by Wholesale Water Provider

Some of the information contained within this chapter is based on information published in *Chapter 1 – Description of the Region*. For a complete and detailed list of sources, see *Appendix 1A*, references for *Chapter 1*.

3.2 Identification of Groundwater Sources¹

3.2.1 Groundwater Aquifers

As presented in *Chapter 1*, groundwater resources in Region H consist of two major aquifers and four minor aquifers. The two major aquifers are the Gulf Coast aquifer and the Carrizo-Wilcox aquifer, with the Gulf Coast aquifer furnishing the majority of groundwater in the region south of and within Waller and Walker Counties. The four minor aquifers present are the Sparta, Queen City, Yegua-Jackson, and Brazos River alluvium.

¹ The information contained in this portion of *Chapter 3* was provided by LBG-Guyton Associates.

The Carrizo-Wilcox is the main aquifer in the northern part of Region H in Leon County and the northern portion of Madison County. The aquifer is composed of, in ascending order, the Wilcox Group and the Carrizo Formation. Because they are weakly connected hydraulically, they are generally described as one major aquifer. However, for groundwater flow modeling purposes in the Central Queen City Sparta Groundwater Availability Model developed by TWDB, the Wilcox aquifer is modeled as three separate layers and the Carrizo as one layer. The Wilcox Group is composed of alternating beds of sand, sandy clay, and clay with locally interbedded gravel, silt, clay, and lignite. The Carrizo Formation is a uniform, well sorted sand that contains a few very thin beds of clay; the aquifer dips downward to the southeast at about 70 to 100 feet per mile. The Carrizo-Wilcox aquifer supplies groundwater for domestic, municipal, manufacturing, and agricultural uses in Leon and Madison Counties. *Figure 3-1, Major Groundwater Aquifers*, provides a map showing the location of the aquifer.

A groundwater availability model (GAM) was developed for the Carrizo-Wilcox, Queen City and Sparta aquifers in the area of Leon and Madison Counties, and the model is described in a report prepared by the TWDB entitled *Groundwater Availability Models for the Queen City and Sparta Aquifers*, October 2004. The model divides the Carrizo-Wilcox aquifer into four layers, which are the Carrizo Sand or Carrizo Formation and the Calvert Bluff, Simsboro and Hooper Formations of the Wilcox Group. The model also has layers for the Queen City aquifer and the Sparta aquifer. The main layers of the model that provide substantial amounts of water are the Carrizo Sand and the Simsboro, with a smaller amount of water provided by the Sparta aquifer. Utilization of the model provides an additional method to evaluate the groundwater resources in the northern part of Region H.

The Gulf Coast aquifer consists of four general water-producing units. The geologically youngest unit is the Chicot aquifer, followed by the Evangeline aquifer, the Jasper aquifer, and the Catahoula Formation. The Chicot and Evangeline aquifers are the more prolific water-producing units in the Gulf Coast aquifer followed by the Jasper aquifer and the Catahoula Formation. The Gulf Coast aquifer extends from the Gulf Coast to approximately 100 to 120 miles inland in Walker and Trinity Counties. The units are composed of alternating beds of sand, silt, and clay; shale can occur at deeper depths at and below the base of the Evangeline aquifer. Formation beds vary in thickness and composition and the areal extent of individual beds normally cannot be traced over extended distances. Total aquifer sand thickness varies and can be as great as several hundred feet. The Gulf Coast aquifer supplies groundwater for domestic, municipal, manufacturing, and agricultural uses in Austin, Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Polk, San Jacinto, Trinity, Walker, and Waller Counties. The estimates of groundwater availability for Austin, Fort Bend, Galveston, Harris, Montgomery, Walker and Waller Counties are consistent with either groundwater management plans or groundwater management strategies developed by the groundwater conservation districts or subsidence districts that encompass the counties. The estimates of availability are the maximum amounts of groundwater that can be withdrawn in the future, based on the planning and rules and regulations of the districts. For Chambers, Liberty, Polk, San Jacinto and Trinity Counties that are not in groundwater conservation districts, the estimates of groundwater availability are the largest estimated amounts that can be pumped annually, based on previous regional water planning efforts including those performed by the TWDB.

A groundwater flow model which includes the counties within Region H has been developed by the TWDB for the Gulf Coast aquifer and was released in February 2005. The model has four layers to represent the Gulf Coast aquifer (Layers 1, 2, 3, and 4), representing the Chicot aquifer, Evangeline aquifer, Burkeville confining unit, and Jasper aquifers, respectively. The model provides an additional tool for evaluating the groundwater resources within Region H.

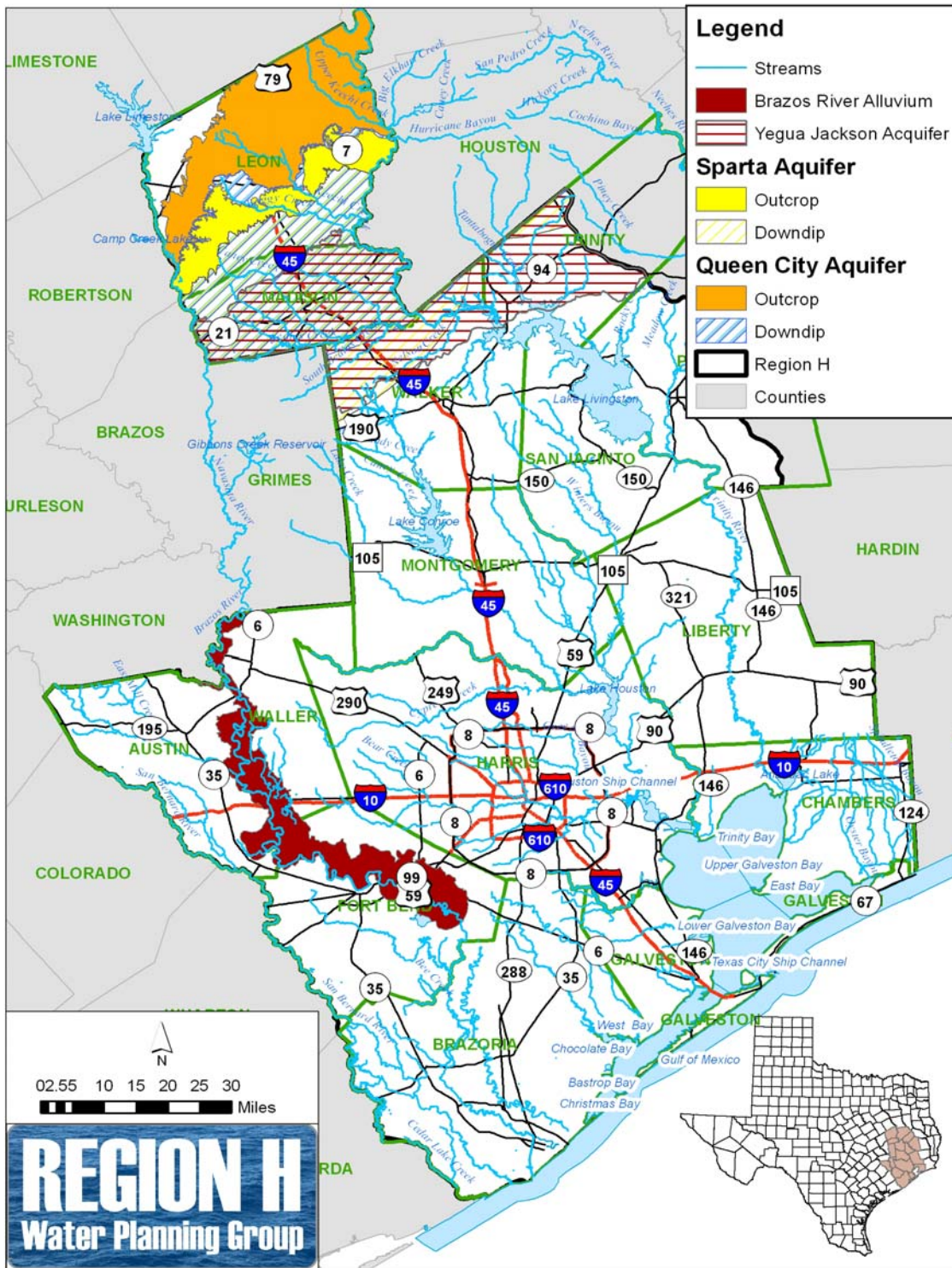
The Queen City Formation is a minor aquifer that occurs in central and southeastern Leon County and in the northern part of Madison County. The Queen City Formation is composed of sand and loosely cemented sandstone with interbedded shale layers occurring throughout. The Queen City Formation ranges in thickness from 250 to 400 feet with approximately 60 to 70 percent of the total thickness being sand according to Texas Water Commission Bulletin 6513 (1965), "Availability and Quality of Ground Water in Leon County, Texas". The aquifer is further described in the 2004 GAM model report developed by the TWDB. Groundwater in small to moderate quantities is provided by the Queen City Formation for domestic, municipal, industrial, and agricultural uses in Leon and Madison Counties.

The Sparta Formation or Sparta Sand is another minor aquifer that occurs in southeastern Leon County, all of Madison County, northwestern Walker County and northeastern Trinity County. The Sparta Formation consists of sand and interbedded clay, with the lower portion of the aquifer containing massive unconsolidated sands with a few layers of shale. The Sparta Formation ranges in thickness from 150 to 300 feet in Leon County and Madison County (Texas Workforce Commission Bulletin 6513). Groundwater from the aquifer is provided for domestic, municipal, and agricultural uses in Leon County and for domestic, municipal, manufacturing, and agricultural uses in Madison County. The Sparta Formation is the groundwater source for the Town of Madisonville and for some water supply corporations in the area.

The Yegua Formation and Jackson Group make up a minor aquifer, designated as the Yegua-Jackson aquifer, which occurs within the region in parts of Madison, Walker, Trinity and Polk Counties. The Yegua Formation consists of sand, interbedded clay, and scattered lignite. The Jackson Group includes all strata between the Yegua Formation and the Catahoula Sandstone and consists of sand, clay, sandstone, and siltstone. The Yegua Formation ranges in thickness from 1,000 to 1,500 feet; the Jackson Group is approximately 1,100 feet thick, according to Texas Board of Water Engineers Bulletin 5003 (1950), "Geology and Ground-Water Resources of Walker County, Texas". Small to moderate quantities of groundwater are provided by the Yegua-Jackson aquifer for domestic, municipal, industrial, and agricultural uses.

The Brazos River alluvium is the fourth minor aquifer in the region. The Brazos River alluvium occurs in the floodplain and terrace deposits of the Brazos River in Austin, Fort Bend and Waller Counties as shown on *Figure 3-2, Minor Groundwater Aquifers*. The Quaternary alluvial sediments consist of clay, silt, sand, and gravel according to TWDB Report 345 (1995), *Aquifers of Texas*, with the more permeable sand and gravel present in the lower part of the aquifer. The saturated thickness of the sediments is as much as 85 feet and the width of the alluvium ranges from less than 1 mile to approximately 7 miles, with the Brazos River located within the width of the alluvial deposits. The Brazos River alluvium supplies groundwater for domestic and agricultural purposes in Fort Bend and Waller Counties. In Austin County, it supplies groundwater for domestic, manufacturing, and agricultural uses.

Figure 3-2
Minor Groundwater Aquifers



Recharge to the two major and four minor aquifers is principally from the infiltration of precipitation and streamflow on the outcrops, as shown in *Figure 3-3, Aquifer Outcrop Areas*. A portion of the water infiltrates to the zone of saturation and then moves downdip through the aquifers, while large amounts of precipitation on the outcrops are rejected recharge, and become surface water runoff to ponds, lakes, creeks, streams and rivers. Average annual precipitation in Region H ranges from about 40 inches per year in the northern area to about 50 to 54 per year inches in the southeastern area.

3.2.2 Groundwater Use Overview

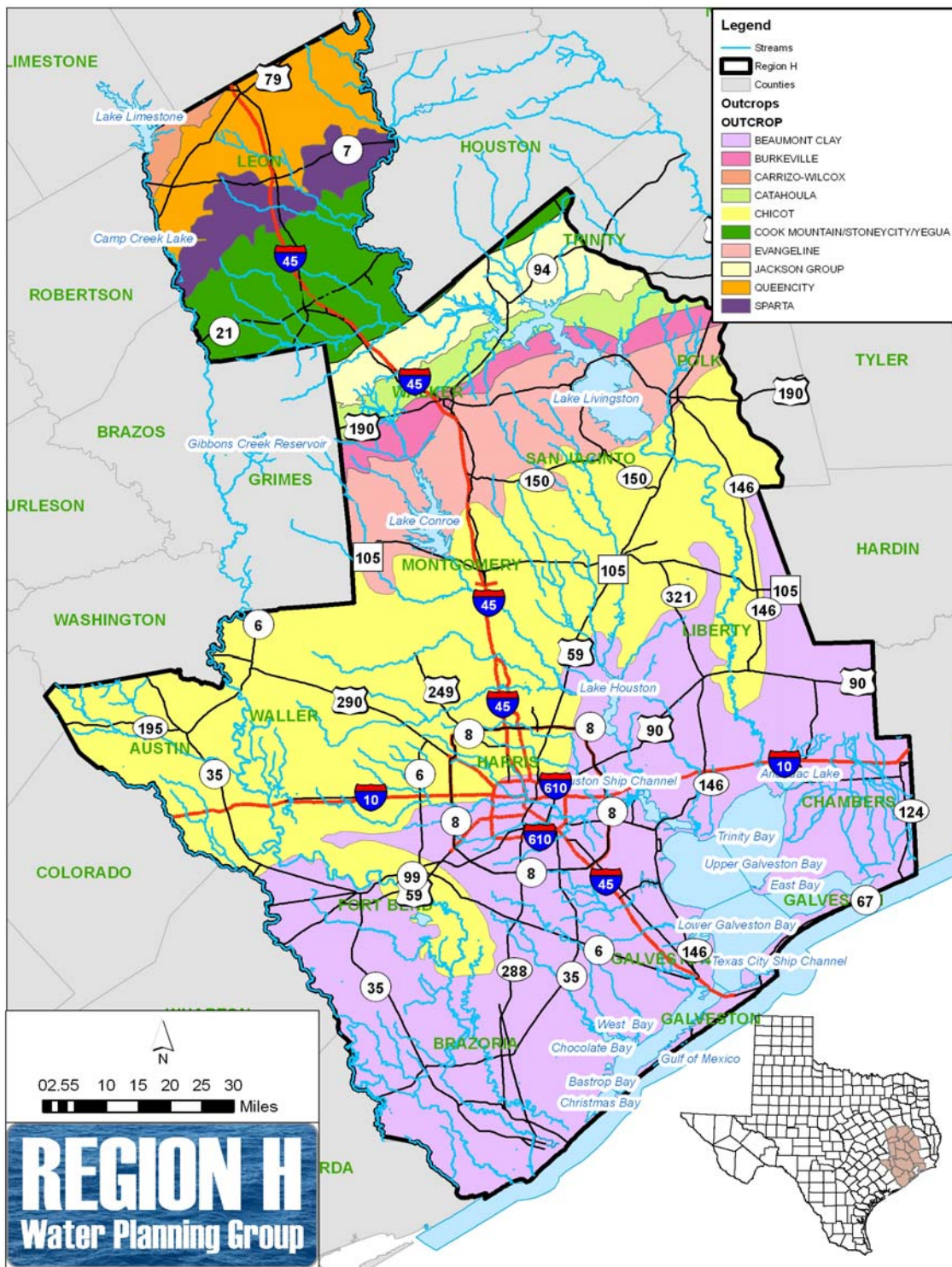
According to TWDB and Harris-Galveston Subsidence District (HGSD), Region H pumped approximately 643,175 acre-feet of groundwater in 2000. Groundwater in the region is used for domestic, municipal, manufacturing, steam-electric power cooling and agricultural purposes. The majority of the water is used for municipal purposes. Municipal usage accounts for approximately 78 percent or 501,626 acre-feet of the water pumped. Municipal pumpage consists of water used for cities and communities, parks, campgrounds and water districts serving principally residential developments. Agricultural usage accounts for approximately 14 percent or 90,084 acre-feet of the groundwater pumped. Major agricultural crops include rice, soybeans, corn, cotton and hay. Cattle are the principal livestock raised in the region. Finally, industrial usage represents approximately 8 percent or 51,454 acre-feet of the groundwater—water pumped for manufacturing, mining, steam-electric power, and other industrial needs. A majority of the overall groundwater usage is in the southern part of the region where more of the population, industrial, and agricultural demands exist and where the aquifer is capable of providing large quantities of water for the various uses. Providing pumping data for 2000 was chosen as it was a year with census data and it was a year with lower precipitation and somewhat higher pumping.

Groundwater pumping data for Region H in 2003, a year with higher overall average annual precipitation, was about 555,300 acre-feet. The year 2003 is the most recent year with groundwater pumping data available from TWDB.

3.2.3 Aquifer Conditions

Groundwater conditions within the region have been and should continue to be favorable for the pumping of substantial quantities of good quality water to help satisfy the multiple water needs of the region. The principal aquifers that will provide the water include the Carrizo-Wilcox in Leon and Madison Counties, the Sparta aquifer system in Madison, Walker and Trinity Counties, and the Gulf Coast aquifer system in the central and southern sections of the region. Smaller amounts of water can be provided by the Queen City, Sparta, Yegua-Jackson, and Brazos River alluvium aquifers, with the minor aquifers being particularly important in areas that do not require large quantities of water to reliably meet the demands.

Figure 3-3
Aquifer Outcrop Areas



3.2.3.1 Carrizo-Wilcox Aquifer

The Carrizo-Wilcox aquifer was deposited in a manner that resulted in a sequence of geologic formations of interbedded sand, silt, clay and shale having a thickness of about 2,000 feet in the northern part of the region. The Carrizo Sand is one of two principal water-producing units of the Carrizo-Wilcox aquifer and it is about 100 to 200 feet thick. The Simsboro Sand is the major water-producing unit in the Wilcox and is about 200 to 400 feet thick. Currently, the overall availability of water from the Carrizo-Wilcox aquifer in Leon and Madison Counties is about 8,400 acre-feet per year based on the management plan adopted by the Mid-East Texas Groundwater Conservation District (METGCD) that includes Leon and Madison Counties. The estimate of groundwater availability for the two counties is under review by the METGCD and may be revised in the future. The current estimates of groundwater availability within the METGCD are consistent with the management plan adopted by the District. The METGCD is developing desired future conditions for the aquifers which will result in an estimate of managed available groundwater and those estimates may vary some from the current estimates of availability in Leon and Madison Counties. If that occurs, the revised estimates for groundwater availability in the two counties can be included in the next regional water planning effort. In 2000, about 4,030 acre-feet of groundwater was pumped from the aquifer in the two counties, based on data from TWDB. Conditions are favorable in the two counties to develop additional supplies from the Carrizo-Wilcox aquifer. The development should be done in a manner that will properly manage the aquifer and monitor its response to the stress of additional groundwater pumping. Water from the aquifer contains less than 1,000 milligrams per liter (mg/l) of total dissolved solids, but water from the Carrizo Sand can contain elevated levels of iron that require sequestering or treatment for removal for water used for most municipal and industrial purposes.

3.2.3.2 Gulf Coast Aquifer

The Gulf Coast aquifer was deposited in a manner that resulted in interbedded sand and clay layers with a substantial thickness of sand that contains water of good quality. The lower unit of the aquifer, the Catahoula Sandstone, is screened by wells for the City of Huntsville and other wells in Walker County. To the south, in Galveston County, the Chicot unit is screened in wells used by the City of Galveston. The aquifer is capable of yielding larger quantities of water in the central and southern parts of Region H and has been utilized over the past 100 years to provide part of the water supply. The Gulf Coast aquifer has sand thicknesses ranging from about 200 to 500 feet in the central and southern parts of the region with the sands containing freshwater decreasing in thickness as the aquifers approach within about 30 to 40 miles of the Gulf Coast.

The pumpage of large quantities of water in the southern part of the region has caused the aquifer's potentiometric head to decline from 50 to about 350 feet in parts of Harris County. Land subsidence of significant magnitude has occurred in parts of Harris and Galveston Counties, resulting in the gradual reduction and shift in areal extent of groundwater pumping to the west over the past 25 years. Subsidence is discussed in the next section of this report.

Digital groundwater flow models have been developed over the past 25 years for the Chicot and Evangeline aquifers in the southern part of Region H to help assess the groundwater resources. As mentioned previously, the most recent digital model was developed by the U. S. Geological Survey for the TWDB with a 2004 report regarding the model titled "Hydrogeology and Simulation of Ground-Water Flow and Land-Surface Subsidence in the Northern Part of the Gulf Coast Aquifer System, Texas."

3.2.3.3 Queen City and Sparta Aquifers

The Queen City and Sparta aquifers occur in the northern part of the region and are capable of providing some water in Leon, Madison and Trinity Counties, and the northern part of Walker County. Estimated overall availability from the aquifers is about 25,525 acre-feet per year based on groundwater supply data from TWDB. Water availability estimates from the Queen City and Sparta aquifers for the year 2000 are approximately 12,455, 10,790, 245, and 2,035 acre-feet per year in Leon, Madison, Trinity, and Walker Counties, respectively. The two aquifers are composed of sands that can provide small to moderate quantities of water to wells. The water-transmitting capabilities of the aquifers are limited but adequate for meeting smaller demands (pumping rates of 50 to 1,000 gallons per minute [gpm]). The aquifers contain water with less than 1,000 mg/l of total dissolved solids to depths that range from about 800 to 1,000 feet. Pumping from the two aquifers in Leon and Madison Counties in the year 2000 was about 3,500 acre-feet based on data from TWDB. No pumpage was recorded in the year 2000 TWDB data for either aquifer for Trinity and Walker Counties.

3.2.3.4 Yegua-Jackson Aquifer

The Yegua-Jackson aquifer is located in the northern part of the region and is capable of providing some water in Madison, Polk, Trinity, and Walker Counties. However, estimated usage specifically for the Yegua-Jackson aquifer has not yet been determined by TWDB for these counties. Each of these counties has data available for other-undifferentiated aquifers. According to the TWDB data, the total amount used in these four counties in this category was approximately 3,100 acre-feet in 2000.

The aquifer is composed of sands that can provide small to moderate quantities of water to wells. According to TWDB estimates in the 2002 Texas State Water Plan, yields of most wells completed in the Yegua-Jackson aquifer are small (less than 50 gpm) and net fresh water sands are generally less than 200 feet thick at any location within the aquifer. The quality of the water in the aquifer ranges from good to slightly saline. The 2002 plan also estimates that the entire Yegua-Jackson aquifer in the state produced about 11,000 acre-feet of water in 1997.

3.2.3.5 Brazos River Alluvium

The Brazos River alluvium is a shallow aquifer that is about one to seven miles wide in a corridor along the Brazos River in Waller, Austin, and Fort Bend Counties. The aquifer typically does not extend to a depth greater than 100 feet deep with wells mostly constructed to provide water for irrigation of row crops and hay. The aquifer may contain water with total dissolved solids that approach 1,000 mg/l and have a high total hardness due to the amounts of calcium, magnesium, and sulfate in the aquifer water. Based on estimates from TWDB, the overall availability of water from the Brazos River alluvium in Austin, Waller, and Fort Bend Counties is about 41,500 acre-feet per year with 2000 pumpage in Fort Bend County estimated at 8,737 acre-feet per year by TWDB. No pumpage was recorded in the 2000 TWDB data for either Austin or Waller Counties. The aquifer should continue to be able to provide water for various uses.

3.2.4 Subsidence Effects

Subsidence has occurred principally in Harris, Galveston, Brazoria, Fort Bend, and Chambers Counties, as the result of the withdrawal of large quantities of groundwater from the Chicot and Evangeline aquifers. Studies and reports prepared by the U. S. Geological Survey and the HGSD show that about 9-plus feet of land subsidence occurred in a small part of the Houston Ship Channel area with less subsidence further away from the ship channel area. In the City of Katy, total subsidence through the year 2005 is estimated to be about 1.7 feet. In the City of Rosenberg in Fort Bend County, estimated subsidence is less than 1 foot through 2005. HGSD has developed regulatory plans that have been updated through the years. Groundwater pumping in Harris and

Galveston Counties has decreased over the past 23 years as additional surface water has been utilized and less groundwater has been pumped.

A regulatory plan adopted by HGSD in 1999 prescribes general areal pumpage limits for Harris and Galveston Counties for the next three decades until 2030. The regulatory plan pumping requirements were used in estimating the availability of groundwater within the Harris and Galveston Counties area with the estimate of groundwater availability in 2010 being 351,959 acre-feet per year and decreasing to 273,628 acre-feet per year by 2030. HGSD regulatory plan essentially segments Harris and Galveston Counties into three geographic regulatory areas and mandates a reduction in groundwater pumpage per a scheduled reduction timeline. Water users located within the southeastern portion of Harris County and all of Galveston County currently must receive no more than 10 percent of their total water supply from groundwater. This limit or any updated limit adopted by HGSD will exist throughout the Region H planning period. The remainder of Harris County is segmented within two other regulatory areas. Water users within Regulatory Area 2, which comprises the central and east portion of the county, must receive no more than 20 percent of their water supply from groundwater as of year 2000. Groundwater users within the remainder of Harris County, within HGSD Regulatory Area 3, can receive no more than 70 percent of their water supplies from groundwater by year 2010, 30 percent of their water as groundwater by year 2020, and only 20 percent of their water supply from groundwater by year 2030. These regulatory limitations affect all of the WUGs (except irrigation for agricultural purposes and livestock uses) within Harris and Galveston Counties by year 2010, causing a continuing decrease in the allowable amount of groundwater that can be pumped in these two counties over time.

A regulatory plan adopted by the Fort Bend Subsidence District (FBSB) in 2003 also prescribes general areal pumpage limits for the next three decades until 2030 for Fort Bend County. The plan includes pumping limits to control subsidence within the District as needed. The FBSB regulatory plan essentially segments Fort Bend County into geographic regions and requires reductions of groundwater pumpage per a scheduled reduction timeline. Water users located within the northwestern portion of Fort Bend County (Area A) must receive no more than 70 percent of their total water supply from groundwater by 2013 and 40 percent of their water as groundwater by year 2025. This limit or a more stringent limit adopted by FBSB will exist throughout the Region H planning period. Water users within the Richmond/Rosenberg Sub Area, which comprises the central portion of the county, must receive no more than 70 percent of their water supply from groundwater as of year 2015 and 40 percent of their water as groundwater by year 2025. Groundwater users within the remainder of Fort Bend County, FBSB Regulatory Area B, must be permitted for increases in withdrawal but are not currently subject to groundwater reduction requirements. These regulatory limitations affect all of the WUGs (except irrigation for agricultural purposes) within Fort Bend County by year 2013 or 2015, creating a limit to the allowable amount of groundwater that can be pumped in the county over time.

3.2.5 Groundwater Availability in Fort Bend and Montgomery Counties

Groundwater pumpage in Fort Bend County has been increasing over the past years from approximately 69,000 acre-feet per year in 1990 to about 90,060 acre-feet per year in 2003 and 91,320 acre-feet per year in 2004, based on data provided by FBSB. Groundwater availability for the county was estimated by FBSB at about 168,025 acre-feet per year from the Gulf Coast aquifer in the year 2010 and reduced to 119,368 acre-feet per year in 2030. The estimates of groundwater availability are the largest amounts that can be considered, based on the Groundwater Reduction Plan that is a part of the rules and regulations of the FBSB. Over the past 10 years, static water levels within the county in observation wells completed in the Chicot and/or Evangeline aquifer have fluctuated some, but generally have been stable in east, west and central Fort Bend County. In the north part of Fort Bend County, there has been about 35 to 45 feet of water-level decline over the past 10 years in some wells that screen the sands in the Evangeline aquifer (refer to *Figure 3-4* through *Figure 3-7*). There have been smaller amounts of static water-level decline in other areas of Fort Bend County as shown on *Figures 3-4, 3-5 and 3-7*. A study by the U.S. Geological Survey

(Scientific Investigation Map 3081) shows that from 2004 to 2009 static water-level change in the Chicot aquifer in Fort Bend County ranged from about 20 feet of decline in the most northeast part of the county to 20 feet of rise in the easternmost part of the county.

For the Evangeline aquifer, Scientific Investigation Map 3081 shows that from 2004 to 2009, static water-level declines ranged from zero to 40 feet in Fort Bend County with the largest amount of decline in the north part of the county. The southwest and west parts of the county showed essentially no static water-level decline from 2004 to 2009.

The Gulf Coast aquifer provides groundwater to Montgomery County, with the Jasper aquifer being the principal source for about two-thirds of the county, and the Chicot and Evangeline aquifers providing water in the south central and southeast parts of the county. The estimated groundwater availability from the Gulf Coast aquifer is about 64,000 acre-feet per year, based on the groundwater management plan adopted by the Lone Star Groundwater Conservation District. The estimate of groundwater availability is, for planning purposes, the largest amount of groundwater that can be utilized based on the rules of the Lone Star GCD. The estimate of groundwater availability for the Lone Star GCD may change in the future, based on additional hydrogeologic and planning data that are developed by the District. Pumpage within the county was about 55,990 acre-feet in 2000 and 52,640 acre-feet in 2004, based on data from TWDB and the Lone Star GCD. Pumpage principally is in the central and southern parts of the county along the Interstate Highway 45 (IH 45) corridor, around Lake Conroe, and in the southeastern part of the county north of the City of Humble.

Past pumpage and subsequent aquifer response to pumpage show that the development of additional groundwater beyond the estimated availability within Montgomery County will cause further potentiometric head decline in wells. Groundwater pumpage should be spread throughout the county to take advantage of developing water in areas where aquifer conditions are favorable but where the demand has not developed for the water, which is principally in the western and eastern portions of the county away from the IH 45 corridor area.

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Figure 3-4
East Fort Bend County – Static Water Levels in Wells

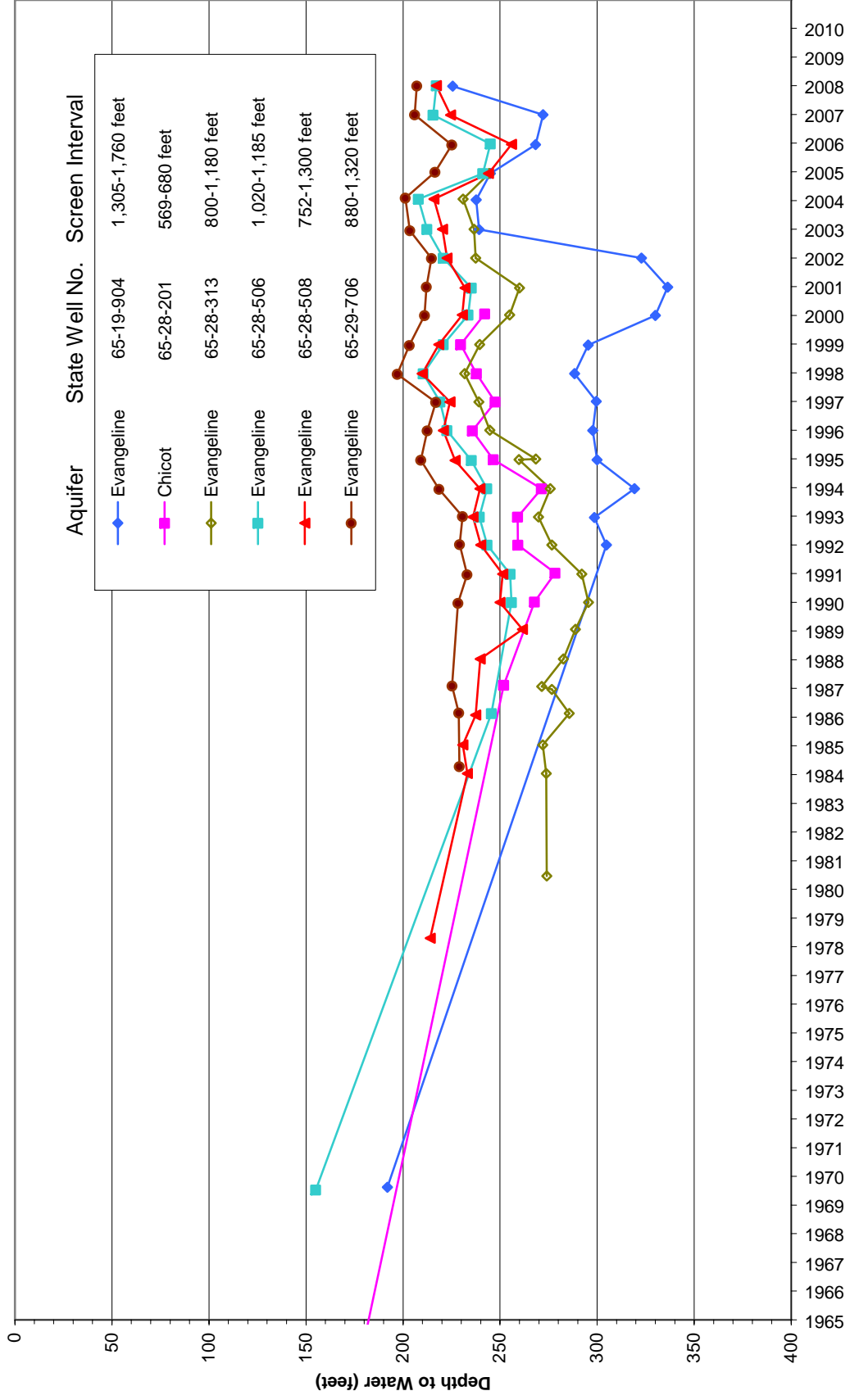


Figure 3-5
Southwest Fort Bend County – Static Water Levels in Wells

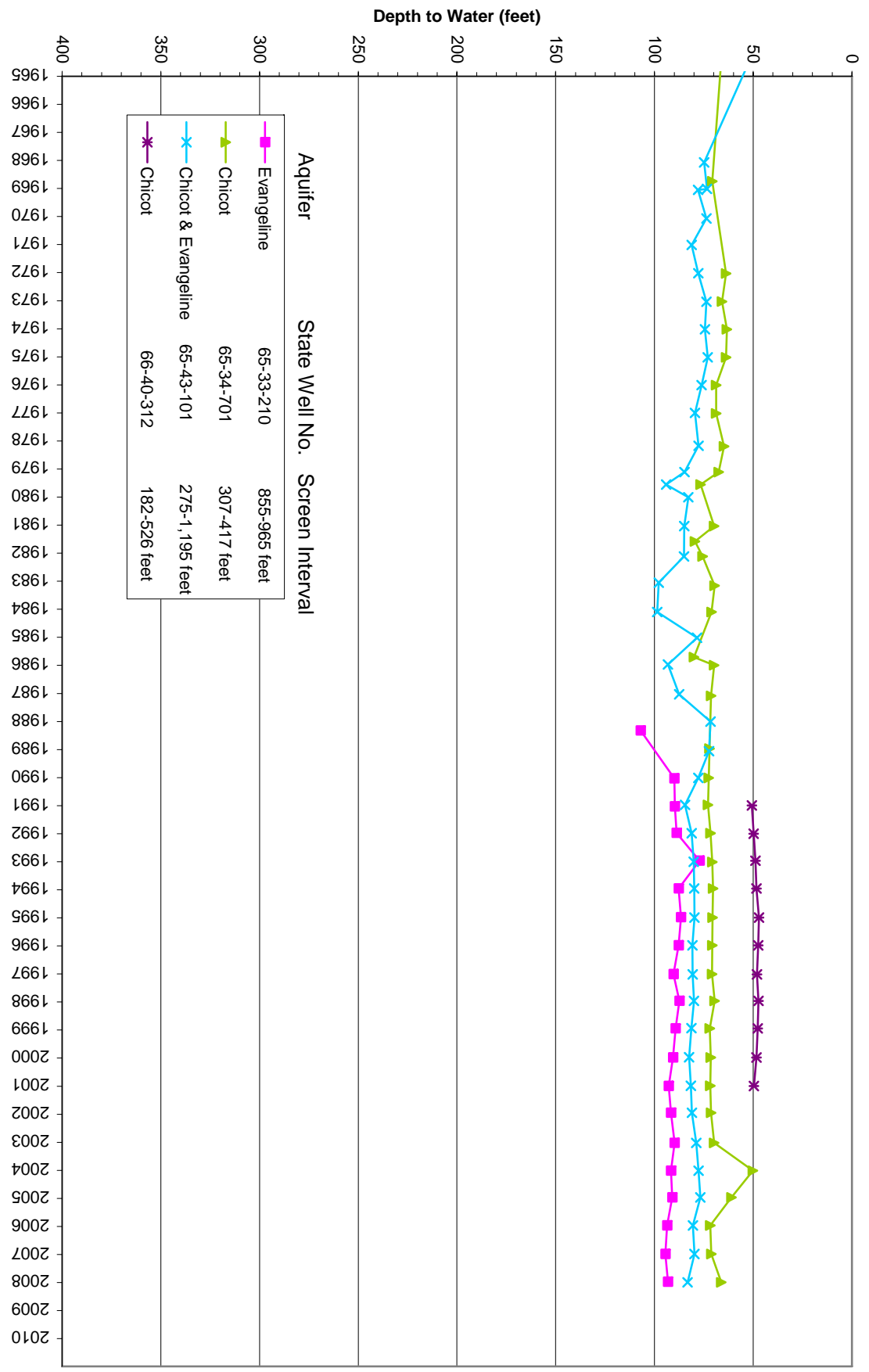


Figure 3-6
North Fort Bend County – Static Water Levels in Wells

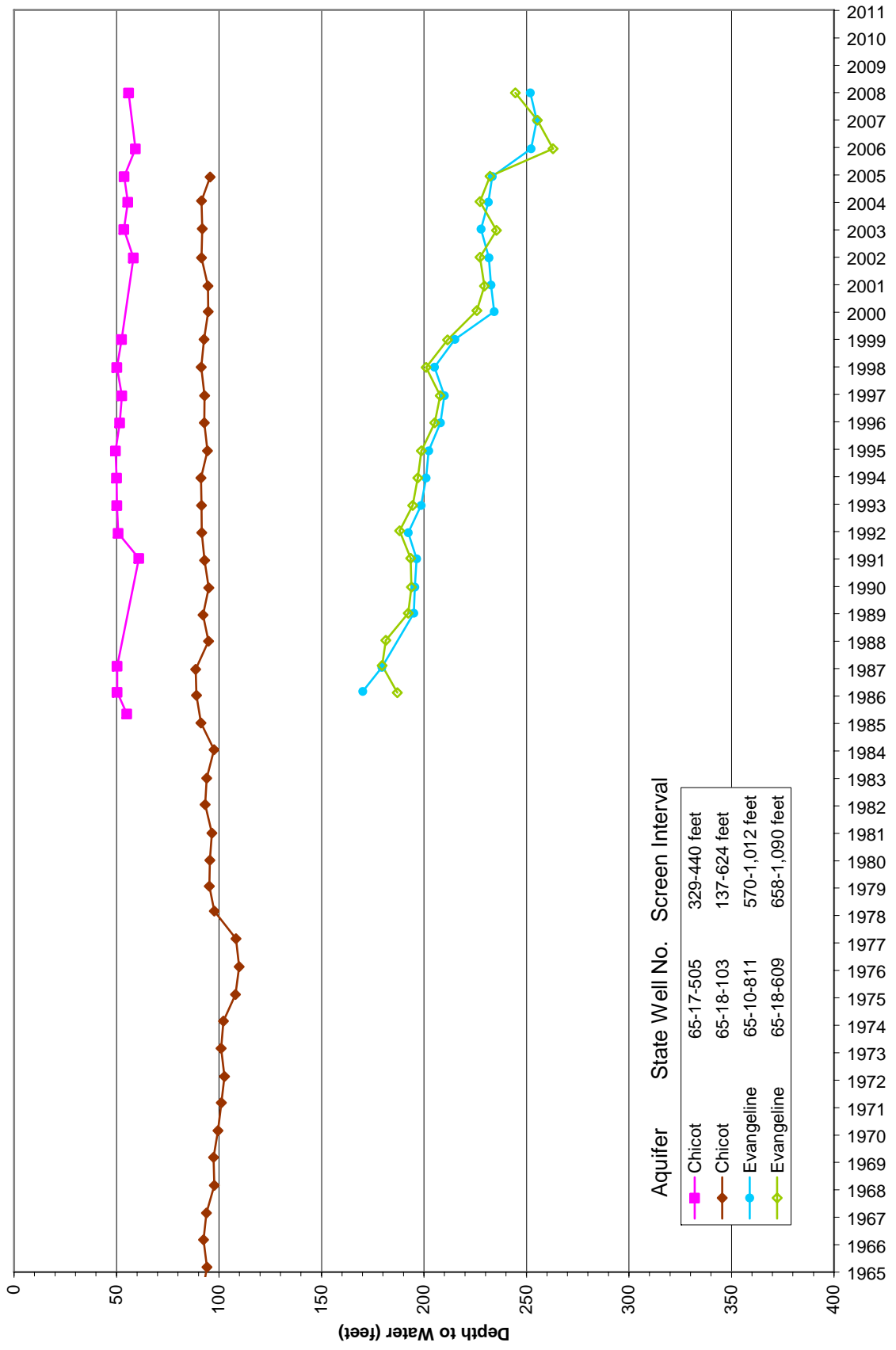
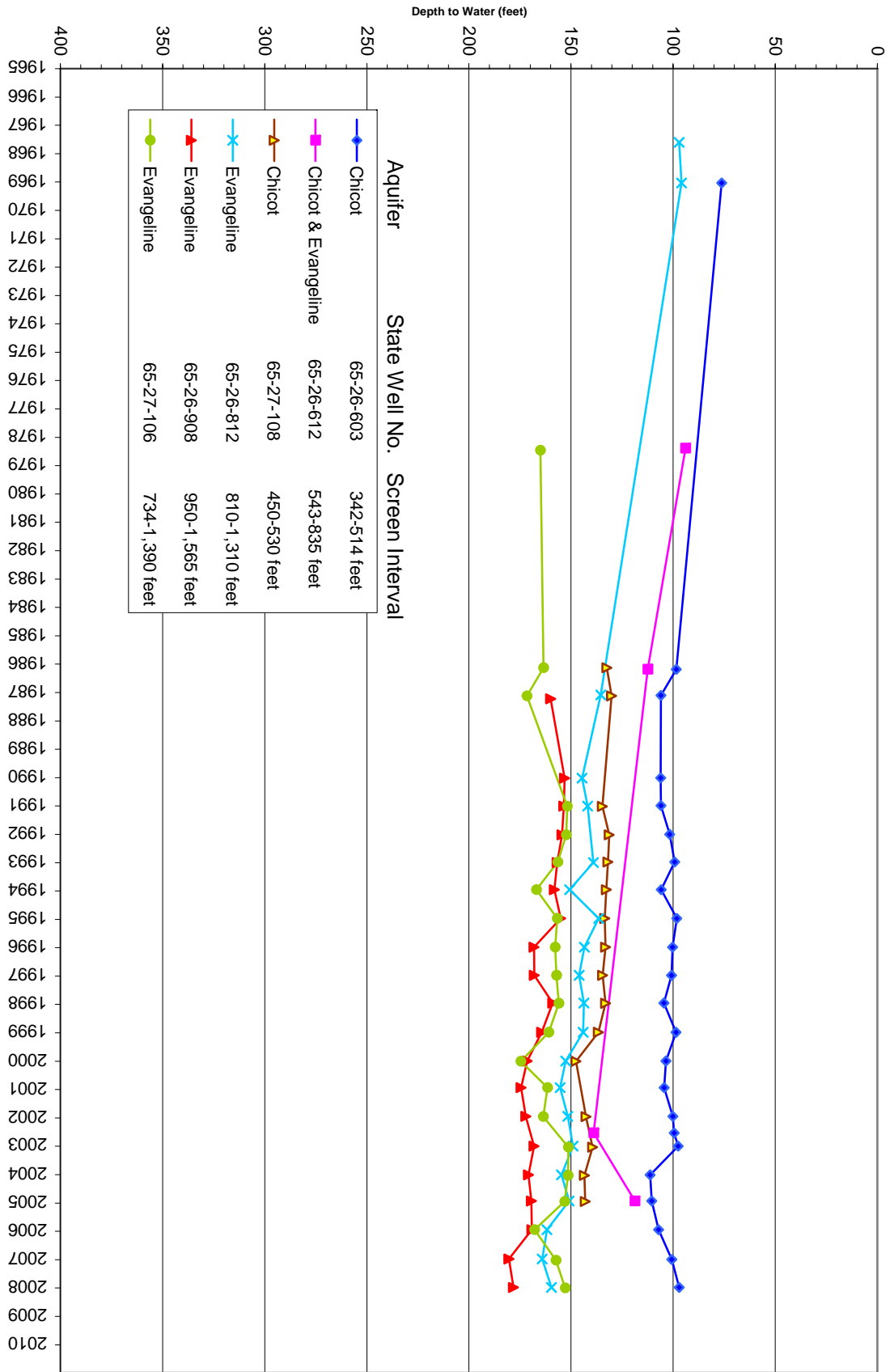


Figure 3-7
Central Fort Bend County – Static Water Levels in Wells



3.2.6 Public Supply Groundwater Usage

Region H relied on groundwater to provide approximately 50 percent or 527,006 acre-feet of the municipal water supply in 2000. Austin, Leon, Liberty, Madison, Montgomery and Waller Counties relied on groundwater to supply essentially 100 percent of the domestic and municipal demand. *Table 3-1* gives the amount of groundwater pumped for municipal purposes for each county in the region as reported by TWDB. Within the region, Harris County accounted for the most municipal groundwater usage in 2000 with 337,837 acre-feet. The next highest demands in 2000 were Fort Bend County with 68,257 acre-feet, Montgomery County with 52,333 acre-feet, and Brazoria County with 26,796 acre-feet. Municipal users represent cities and communities, parks, campgrounds, and water districts. The year 2000 had below normal precipitation for the year and during the summer months, so groundwater pumpage in 2000 was higher than normal.

According to TWDB and HGSD, in 2000 Region H relied on groundwater to provide approximately 8 percent of the water used for industrial purposes, which was approximately 51,607 acre-feet. Industrial consumption represents water that is used for manufacturing, mining, and steam-electric power. *Table 3-2* shows the amount of groundwater used for industrial purposes for each county in the region. Within the region, Harris County accounted for the most industrial groundwater usage in 2000 with approximately 20,800 acre-feet. The next highest users were Fort Bend County with 9,670 acre-feet, Liberty County with 8,952 acre-feet, and Chambers County with 4,063 acre-feet.

3.2.7 Industrial Groundwater Usage

According to TWDB and HGSD, in 2000 Region H relied on groundwater to provide approximately 8 percent of the water used for industrial purposes, which accounted for approximately 51,607 acre-feet of the groundwater used in Region H. Industrial consumption represents water that is used for manufacturing, mining, and steam-electric power. *Table 3-2* shows the amount of groundwater used for industrial purposes for each county in the region. Within the region, Harris County accounted for the most industrial groundwater usage in 2000 with approximately 20,800 acre-feet. The next highest users were Fort Bend with 9,670 acre-feet, Liberty with 8,952 acre-feet and Chambers with 4,063 acre-feet.

3.2.8 Agricultural Groundwater Usage

According to TWDB and HGSD, in 2000 Region H relied on groundwater to provide approximately 32 percent of the water used for agricultural purposes. This equaled approximately 14 percent or 92,953 acre-feet of the total groundwater used in the region. Agricultural usage represents water that is used for livestock purposes and irrigation of crops. The main agricultural crops in the region include rice, cotton and soybeans in the south and corn, cotton and hay in the north. Cattle are the principal livestock raised. *Table 3-3* shows the amount of groundwater used for agricultural purposes for each county in the region. Within the region, Fort Bend County accounted for the most agricultural groundwater usage in 2000 with 24,971 acre-feet. The next highest user is Waller County with 22,765 acre-feet followed by Harris County with approximately 20,800 acre-feet.

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Table 3-1
Municipal Groundwater Demand From 2000 TWDB Data

County	Total Groundwater Used (acre-feet)	Groundwater Used for Municipal Purposes (acre-feet)	Percent of County's Total Groundwater Used for Municipal Purposes	Percent of County's Municipal Water Demand Supplied by Groundwater
Austin	13,004	3,569	27.4	100.0
Brazoria	36,925	26,796	72.6	66.9
Chambers	6,355	2,014	31.7	45.5
Fort Bend	102,898	68,257	66.3	98.8
Galveston	5,791	5,163	89.2	14.0
Harris	379,209	337,837	89.1	42.1
Leon	4,849	1,883	38.8	100.0
Liberty	22,113	9,401	42.5	100.0
Madison	3,180	2,621	82.4	100.0
Montgomery	55,403	52,333	94.5	100.0
Polk	4,626	3,952	85.4	68.0
San Jacinto	2,931	2,742	93.6	96.8
Trinity	1,370	1,200	87.6	65.6
Walker	5,386	4,625	85.9	31.4
Waller	27,526	4,613	16.8	100.0
Total	671,566	527,006	78.5	

Table 3-2
Industrial Groundwater Demand From 2000 TWDB Data

County	Total Groundwater Used (acre-feet)	Groundwater Used for Industrial Purposes (acre-feet)	Percent of County's Total Groundwater Used for Industrial Purposes	Percent of County's Industrial Water Demand Supplied by Groundwater
Austin	13,004	204	1.6	97.6
Brazoria	36,925	2,139	5.8	1.9
Chambers	6,355	4,063	63.9	8.8
Fort Bend	102,898	9,670	9.4	13.7
Galveston	5,791	200	3.5	0.5
Harris	379,209	20,800	5.5	6.8
Leon	4,849	1,410	29.1	61.7
Liberty	22,113	8,952	40.5	100.0
Madison	3,180	211	6.6	100.0
Montgomery	55,403	2,800	5.1	62.1
Polk	4,626	419	9.1	79.4
San Jacinto	2,931	75	2.6	100.0
Trinity	1,370	8	0.6	100.0
Walker	5,386	508	9.4	20.1
Waller	27,526	148	0.5	100.0
Total	671,566	51,607	7.7	

Table 3-3
Agricultural Groundwater Demand From 2000 TWDB Data

County	Total Groundwater Used (acre-feet)	Groundwater Used for Agricultural Purposes (acre-feet)	Percent of County's Total Groundwater Used for Agricultural Purposes	Percent of County's Agricultural Water Demand Supplied by Groundwater
Austin	13,004	9,231	71.0	75.5
Brazoria	36,925	7,990	21.6	8.0
Chambers	6,355	278	4.4	0.7
Fort Bend	102,898	24,971	24.3	49.9
Galveston	5,791	200	3.5	3.9
Harris	379,209	20,800	5.5	89.8
Leon	4,849	1,556	32.1	69.7
Liberty	22,113	3,760	17.0	13.0
Madison	3,180	348	10.9	40.0
Montgomery	55,403	270	0.5	46.9
Polk	4,626	255	5.5	54.0
San Jacinto	2,931	114	3.9	12.0
Trinity	1,370	162	11.8	18.6
Walker	5,386	253	4.7	40.0
Waller	27,526	22,765	82.7	98.4
Total	671,566	92,953	13.8	

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3.2.9 Groundwater Drought Susceptibility

The aquifers within Region H generally have high transmissivity rates or values and are less susceptible to drought because there is a very large amount of water in storage in the aquifers to serve as a buffer, which means the static water levels do not fluctuate drastically during a severe drought. The static water levels recover following a drought when groundwater withdrawals are less. In general, Region H water suppliers have established drought triggers for their groundwater systems as a function of system capacity (wells, pumps, storage, etc.) as opposed to other regions where static aquifer groundwater levels are used as drought triggers.

3.2.10 Groundwater Availability Summary

Groundwater has been an important water resource within Region H for the past 100 years. The major Carrizo-Wilcox and Gulf Coast aquifers and minor Sparta, Queen City, Yegua-Jackson, and Brazos River alluvium aquifers should continue to provide an important water resource to the region that will be used in combination with surface water to help satisfy the regional water demand. Water of good quality continues to be available from the aquifers and should continue in the future with prudent resource management. Groundwater supplies were calculated for each county and basin from various sources and are provided in *Table 3A.1*.

For aquifers in Fort Bend, Galveston and Harris Counties, which are within the jurisdictions of FBSD and HGSD, the available supplies shown in *Table 3A.1* represent the regulated groundwater supplies set by the districts and not necessarily the amount of water available from the aquifer. Water User Groups that are not regulated by the subsidence districts, such as irrigators and small domestic well users, would be allowed to withdraw water in excess of these supplies in order to meet their demands. The certified groundwater management plan for the Bluebonnet Groundwater Conservation District was used as a basis for estimating groundwater availability in Austin and Walker Counties. The certified groundwater management plan for the Lone Star Groundwater Conservation District was used as a basis for determining or estimating groundwater availability in Montgomery County.

Groundwater availability within HGSD is consistent with the HGSD groundwater reduction plan through 2030. Groundwater availability within HGSD may change a modest amount after 2030 depending on updates to the groundwater reduction plan in future years. For this current planning effort it is assumed that groundwater availability will remain the same after 2030 within HGSD with the understanding that if the district's groundwater reduction plan is revised at a future date, the estimates of groundwater availability after 2030 may also be revised.

Groundwater availability within Austin, Waller and Walker Counties is based on information provided by the Bluebonnet Groundwater Conservation District. The district is participating in the GMA-14 effort which is developing desired future conditions for the aquifers. That planning effort is to be completed by September 2010. Groundwater availability in Austin, Waller and Walker Counties may change a modest amount based on the results of the GMA-14 desired future conditions planning effort. If that occurs, revised estimates of groundwater availability will be included in future Region H planning efforts.

3.3 Identification of Surface Water Sources

As stated in *Chapter 1*, surface water sources in Region H consist of reservoir storage, ROR supply from three rivers (the Trinity, San Jacinto and Brazos) and four coastal basins (the Neches-Trinity, Trinity-San Jacinto, San Jacinto-Brazos and Brazos-Colorado). The water supply information presented is based on the Texas Commission on Environmental Quality (TCEQ) Water Availability Models (WAM), updated specifically for the Regional Water Plan. A map showing major surface water sources that serve Region H is included as *Figure 3-8*.

3.3.1 Available Surface Water

Surface water availability was estimated using the TCEQ WAM for the river basins within Region H. The WAMs use the Water Rights Analysis Package (WRAP), developed at Texas A&M University, to simulate diversions under current and future conditions using historical rainfall and evaporation data (the model does not increase diversion amounts over time, as will actually occur). Instead, the model simulates one set of monthly diversion targets attempted annually against a historical inflow dataset, which is typically 50 years long and varies each year. The drought of record (DOR) for most of Texas occurred in the 1950s and is reflected in the historic dataset for each basin. Water diversions are modeled according to the parameters of each particular water right and are taken in priority order, such that the most senior water rights are satisfied before junior rights are allowed to divert water. Output files are compared by reviewing the statistical frequency of meeting diversion amounts or target instream flow levels.

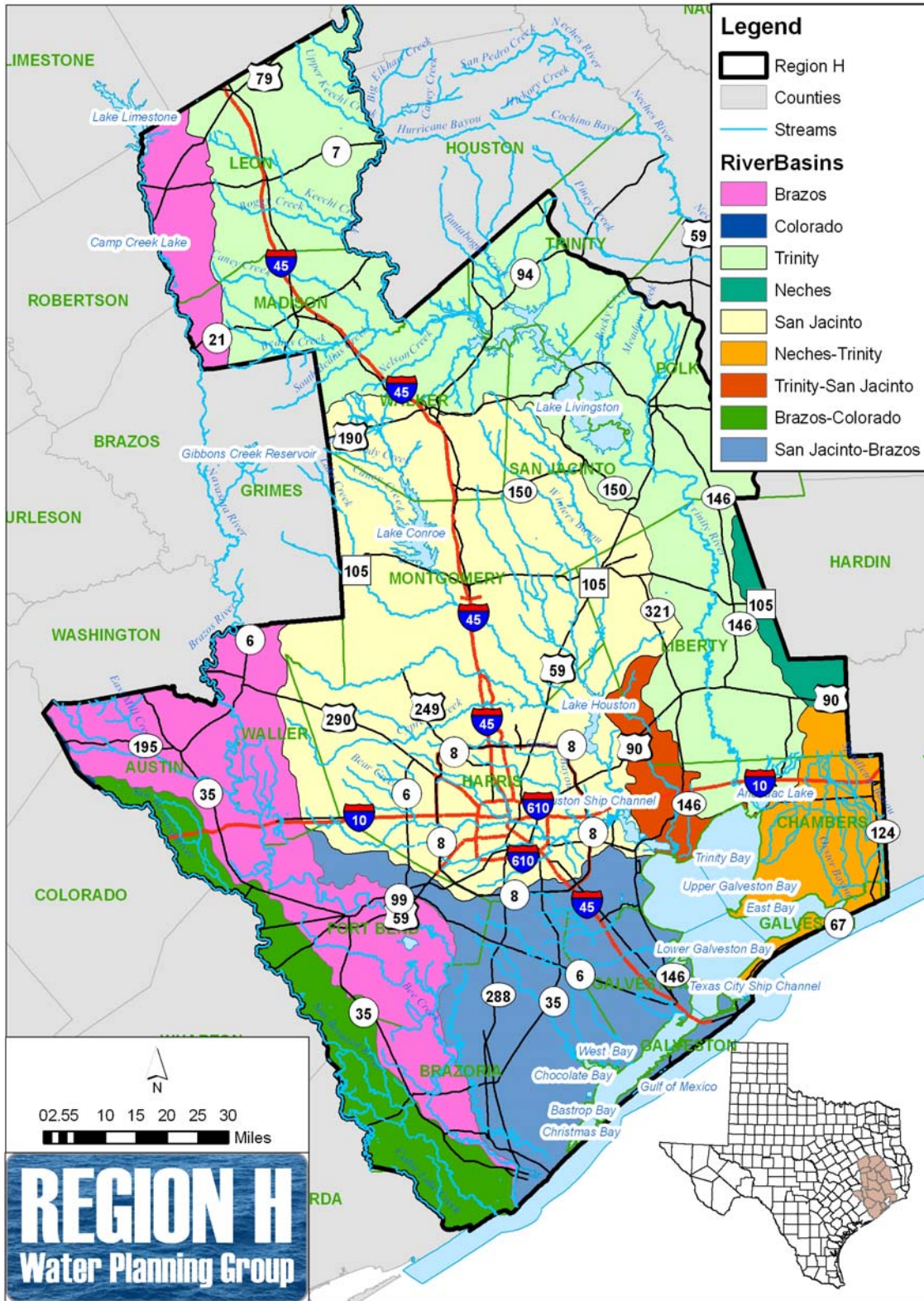
In the 2006 Region H Water Plan the reliability of run-of-river water rights was evaluated in terms of reliable yield; that is, the least amount of water diverted amongst all of the calendar years modeled. While this assumption is adequate for water users that may not require steady monthly diversions during a drought of record, other users such as municipal and industrial demands typically require a higher degree of water availability. To address this concern, the 2011 Region H Water Plan evaluated water rights on a monthly basis in addition to an annual basis. The monthly firm yield of run-of-river water rights was evaluated by iteratively reducing the annual target diversions until no monthly shortages occur throughout the simulation period. The reliable yield of a water right is the least amount of water diverted among all of the calendar years modeled.

For reservoirs, an additional step is required to determine firm yield. Water stored in reservoirs allows diversions to continue during periods of drought; however, diverting at high rates rapidly depletes storage. To find the optimal target for a reservoir an iterative process is used, modeling the permitted diversion first at its full authorized amount and then at reduced target diversions until a yield is identified that is met throughout the simulation period.

There were originally eight WAM scenarios (referred to as model runs) simulated under the TCEQ program. The Guidelines for Regional Water Planning require the use of WAM Run 3, full-authorized diversion of current water rights with no return flows, when determining the supply available to the region. This is a very conservative approach, since diversions for municipal and manufacturing users typically return up to 60 percent of that water to streams as treated wastewater effluent. However, the majority of water rights do not address return flows to source streams, implying a right to full consumptive use. The Region H Planning Group adopted the Region G – Brazos G WAM which modified the Brazos River WAM Run 3 to allow for some return flows from wastewater plants in the Brazos River basin. Further discussion of the Brazos G WAM is described in detail in *Section 3.3.1.6 Brazos River Basin*.

Table 3-4 summarizes the projected yield from surface water supply sources currently available to Region H. The total estimated 2060 yield available to Region H (approximately 2,641,400 acre-feet per year) is approximately equal to the estimated total in the 2006 Regional Water Plan, but the distribution between permits has changed. The yield of several reservoirs decreased due to the projected storage loss as a result of sedimentation, but additional water rights were added as a result of the WAM modeling. The major water rights and modeling assumptions for each basin are discussed in detail below.

Figure 3-8
Major Surface Water Sources



**Table 3-4
Current Surface Water Supply Sources Available in Region H**

Projected Year 2060 Available Yield	
Basin/Reservoir/Run-of-River	(acre-feet/year)
Sam Rayburn Reservoir and Neches Basin Supplies ¹	64,177
Neches-Trinity Coastal Basin	21,754
Trinity Basin	
Lake Livingston/Wallisville	1,344,000
Run-of-River, Lower Basin	224,530
Trinity – San Jacinto Coastal Basin	34,313
San Jacinto River Basin	
Lake Houston	168,000
Lake Houston Additional Yield	5,000
Lake Conroe	74,300
Run-of-River	55,000
San Jacinto – Brazos Coastal Basin	33,051
Brazos River Basin	
BRA/COE System ²	155,031
Run-of-River, Lower Basin	418,311
Brazos – Colorado Coastal Basin	12,019
Local Supplies (i.e. Stock ponds, etc), all basins	31,895
Total Existing Surface Water Supply Available to Serve Region H	2,641,381

¹ The total yield of Sam Rayburn Reservoir is approximately 820,000 acre-feet/year. The value shown only includes the portion currently contracted to customers within Region H.

² This amount is based on current contracts within Region H. The total yield of the BRA/COE system is approximately 650,000 acre-feet/year.

The TCEQ WAM models were updated to add new water rights and reflect the effects of sedimentation on reservoirs. Reservoirs reduce the velocity of the streams they impound, causing suspended soil particles to settle; over time, storage volume is lost due to this accumulation. Sedimentation rates were determined and applied to on-channel reservoirs to calculate the year 2000 and year 2060 storage volumes (see *Table 3-5*). The WAM model was then run under each storage condition. The storage capacity lost to sedimentation reduced the yield of most reservoirs in the year 2060. This change in yield was represented as a linear decline over time in the summary tables.

Table 3-5
Water Supply Reservoir Capacities

Reservoir	Surface	Storage Capacity		
	Elev. (feet msl)	Original (ac-ft)	2000 (ac-ft)	2060 (ac-ft)
Trinity Basin				
Livingston	131.0	1,741,867	1,738,326	1,717,083
Anahuac	5.0	35,300	25,781	25,691
San Jacinto Basin				
Houston	44.5	133,990	131,547	106,409
Conroe	201.0	416,228	414,143	377,567
Brazos Basin – BRA/COE System				
Aquilla	537.5	52,400	45,319	20,437
Alan Henry	2220.0	115,937	94,808	39,478
Belton	594.0	457,600	437,656	415,255
Georgetown	791.0	37,100	36,904	36,519
Granger	504.0	82,000	52,525	20,973
Stillhouse Hollow	622.0	235,700	227,825	216,165
Granbury	693.0	153,500	129,011	87,743
Possum Kingdom	987.0	724,738	540,340	398,000
Whitney	533.0	627,100	554,203	504,153
Limestone	363.0	217,494	208,017	172,405
Proctor	1162.0	59,400	55,457	49,599
Somerville	238.0	160,100	147,104	126,869

The total supply available from each source available to Region H is included in *Table 3A.1, Current Water Sources*, in *Appendix 3A*. In general, *Table 3A.1* indicates the maximum amount of water supply that could be obtained during DOR conditions from each supply source. This information was compiled from existing contracts and water rights in Region H, the updated WAM for surface water supplies and groundwater studies addressed in *Section 3.2* of this chapter. Not all of the sources listed in *Table 3A.1* are exclusively available to Region H. Reservoirs located in the upper portions of the Brazos, Trinity and Neches basins are shown with their firm yield, but the portion of that yield available within Region H is limited to the contracted amounts.

3.3.1.1 Neches-Trinity Coastal Basin

Surface supplies in the Neches-Trinity Coastal River Basin were modeled using the TCEQ WAM Run 3 model. Of the water right permits totaling 70,175 acre-feet per year from the Neches-Trinity coastal basin, 40,191 acre-feet per year were reliable during the DOR. Approximately one-third of this firm total is the U.S. Fish and Wildlife Service water right for the Anahuac National Wildlife Refuge. Water rights yielding over 500 acre-feet per year for consumptive uses (all for irrigation) are listed in *Table 3A.1* and have a total reliable yield of 21,754 acre-feet per year. This is almost identical to the basin yield estimated in the 2006 Regional Water Plan (21,701 acre-feet per year). The WRAP input file for this model is included in *Appendix 3B*.

3.3.1.2 Trinity River Basin

The Trinity River Basin contains 32 major reservoirs, including two Region H sources, Lake Livingston/Wallisville and Lake Anahuac. The permitted yield of Lake Livingston was diminished using WAM Run 3, but showed a firm yield in excess of the permit amount in the TCEQ WAM Run 1 (full use with expected return flows). In the 2006 Region H Water Plan it was assumed that sufficient

return flow from the Upper Trinity Basin would be available throughout the planning period to make Lake Livingston's permitted yield firm. As part of the 2011 Region Water Plan Update, a special study was included to analyze the upper basin demands, reuse strategies and return flows projected in the 2006 Region C Water Plan and the effects on the firm yield of Lake Livingston. The study also included updates to reuse strategies and projected return flow estimates identified in the 2008 Region C Water Conservation and Reuse Study. The 2011 Region H plan identified the following:

- Projected Return Flows Available at the Oakwood Gage (CP 8TROA)
- Firm Yield of Lake Livingston during each planning period decade
- Necessary level of return flows required to make the permitted yield of Lake Livingston firm

The firm yield of the Lake Livingston water rights is expected to decrease from the full permitted yield of 1,344,000 acre-ft per year in the year 2010 to 1,265,000 acre-ft per year in the year 2030. The decrease in firm yield is the result of increasing amounts of reuse projected in the upper basin, reducing the amount of return flows available to Region H. The firm yield is then projected to increase after 2030 as Region C begins to import water supplies to meet growing demands. By the year 2050 the permitted yield of Lake Livingston is projected to be firm. The projected reductions in the firm yield of Lake Livingston are anticipated to be a conservative estimate, as the upper basin is not expected to implement all of the reuse strategies recommended in the 2006 Region C Plan. The results of the study are summarized below:

- Minimum upper basin net return flows of 253,055 acre-ft per year projected in 2030
- Minimum return flows available to Region H in 2030 of approximately 185,500 acre-ft per year
- Firm yield of Lake Livingston water rights are reduced in decades 2020, 2030 and 2040
- Minimum firm yield of Lake Livingston water rights is approximately 1,265,000 acre-ft per year in 2030
- Minimum level of return flows required to make Lake Livingston water rights firm is approximately 285,000 acre-ft per year in 2060

A summary of the return flow analysis and Lake Livingston yield analysis was prepared to coordinate the findings of this study with Region C. The summary report is included in *Appendix 3C*. The WRAP input files for this analysis are included in *Appendix 3B*.

The reliability of three lower Trinity River ROR supplies came from a set of "fixed right" agreements. The agreements are between the Trinity River Authority (TRA) and the City of Houston (COH) (who jointly own the water rights for Lake Livingston) and three providers of irrigation-water. These irrigation-water providers are the Chambers-Liberty Counties Navigation District (CLCND), the American Rice Growers Co-op Association (Dayton Canal), and the Lower Neches Valley Authority (LNVA) which owns and operates the Devers Canal. Pursuant to the fixed right agreement CLCND, Dayton Canal, and Devers Canal are entitled to divert up to 88,820, 33,000, and 86,000 acre-feet per year, respectively. These diversions occur from the Trinity River and some tributaries of the Trinity River. Although these diversions physically take place downstream of Lake Livingston, they are senior in priority to the Lake Livingston water rights.

Approximately 27,500 acre-feet per year of the Devers Canal's 86,000 acre-feet per year is part of Lake Livingston yield and is reflected in the plan as a contractual commitment of the TRA. Fifty-six thousand, of the remaining 58,500 acre-feet per year of the Devers Canal yield, was purchased by the San Jacinto River Authority (SJRA), for use in the Trinity-San Jacinto Coastal Basin.

Houston recently purchased outright the entire amount of the Dayton Canal fixed right agreement. Additionally, Houston holds another water right in the Trinity River Basin with an authorized diversion of 45,000 acre-feet per year from the Old River Tributary of the Trinity River. The reliable yield of the run-of-river right is 26,510 acre-ft per year.

In addition to the 58,820 acre-feet per year in the fixed right agreements, CLCND also owns the rights (39,613 acre-feet per year, of which 17,700 acre-feet per year is reliable) to the Turtle Bayou (Lake Anahuac) supply in the Trinity River Basin. The SJRA purchased a portion (30,000 acre-feet per year) of CLCND's fixed right in 2001. The ownership of the Trinity River Basin supplies is summarized in *Table 3-6*.

Table 3-6
Ownership of Trinity River Basin Supplies

Owner	Source	Permitted Amount (acre-feet/year)	2060 Reliable Yield (acre-feet/year)
COH	Lake Livingston/Wallisville System	940,800	940,800
TRA	Lake Livingston/Wallisville System	403,200	403,200
COH	Trinity River and Big Ditch	38,000	33,000
COH	Old River Tributary	45,000	26,510
SJRA	Trinity River	86,000	86,000
CLCND	Trinity River	73,334	58,820
CLCND	Lake Anahuac	39,613	17,700
LNVA	Trinity River	2,500	2,500
Total		1,628,447	1,568,530

The supply amounts shown for the Lake Livingston/Wallisville Saltwater Barrier system are the total permitted diversions for each body of water, as discussed in the paragraph above. The City of Houston has a permit to divert 902,800 acre-feet per year from Lake Livingston and 38,000 acre-feet per year from the Wallisville Saltwater Barrier. The TRA has a permit to divert 351,600 acre-feet per year from Lake Livingston and 51,600 acre-feet per year from the Wallisville Saltwater Barrier. Not all of this water would be available to Region H. Of the amount that is owned by the TRA, approximately 26,900 acre-feet per year is committed outside of Region H. In addition, it should be noted that physical diversions are not made from the Wallisville Saltwater Barrier, but the combined yield of Lake Livingston is increased when operated in conjunction with the Wallisville Saltwater Barrier. The increase in yield is a result of the barrier precluding the need for salinity reduction releases for downstream senior water rights.

3.3.1.3 Trinity-San Jacinto Coastal Basin

The surface water supply in the Trinity-San Jacinto Coastal Basin was modeled using WAM Run 3. Water right permits totaling 44,473 acre-feet per year from the Trinity-San Jacinto Coastal Basin were analyzed using the water availability model. Of this, 34,973 acre-feet per year was found to be reliable during the DOR. Water rights yielding over 500 acre-feet per year for consumptive uses are listed in *Table 3A.1* located in *Appendix 3A*, and total 34,313 acre-feet per year. NRG's Cedar Bayou plant has a permit to divert 30,000 acre-feet per year of saline water from Cedar Bayou, which accounts for most of the firm supply. The remaining 4,313 acre-feet per year of reliable yield are irrigation rights. The WRAP input file for this model is included in *Appendix 3B*.

3.3.1.4 San Jacinto River Basin

The surface water supply in the San Jacinto River Basin was modeled using WAM Run 3. Water right permits totaling 374,544 acre-feet per year from the San Jacinto River Basin were analyzed using the water availability model. Of the 374,544 acre-feet per year permitted, 302,300 acre-feet per year was found to be reliable during the DOR. In addition to the surface water rights, the Indirect Reuse Water Right 10-5809 was issued in June 2004 and included in *Table 3A.1 (Appendix 3A)*. The WRAP input file for this model is included in *Appendix 3B*.

The only reliable ROR diversion right included for the basin is the SJRA permit for 55,000 acre-feet per year. SJRA diversions are physically made from Lake Houston and are the primary source of water for the SJRA Highlands Canal System. The water right is included in the TCEQ model as a run-of-river right as originally permitted. However, the reliability of the water right is based on a water contract between the City of Houston and the San Jacinto River Authority. As a result, the 2011 Region H Water Plan recommends the full permitted amounts of 55,000 acre-ft per year for the SJRA run of river permit and 168,000 acre-ft per year for the original Lake Houston permit as reliable in accordance with the 2001 and 2006 Region H Water Plans. Other reliable run-of-river water rights in the basin were either for recreation or less than 500 acre-feet per year and were not included in *Table 3A.1 (Appendix 3A)*. In September 2009, the TCEQ granted an additional 80,000 acre-feet of run-of-river split between the City of Houston and the SJRA. Physically, diversions will be made from Lake Houston at existing COH and SJRA pump stations. The supply is not 100% reliable but will allow for the use of the in-basin supply, when available, in lieu of transferring water from the Trinity Basin.

Lake Houston

The available yield of Lake Houston is determined from two permitted diversions. The original permitted diversion of Lake Houston, 168,000 acre-feet per year, is firm throughout the planning period. This is due to the downstream location of Lake Houston on the San Jacinto River and its seniority relative to other major water rights in the basin. The COH owns the entire original permitted yield from Lake Houston. The 2006 Region H Water Plan included additional yield from Lake Houston as a recommended water management strategy. In 2008, the TCEQ granted the additional yield from Lake Houston (Permit No. 5807) with a permitted diversion of 28,200 acre-feet per year. The 2011 Plan has been updated to include the additional yield from Lake Houston as part of the available supply. Using the 2060 sedimentation condition, only an additional 5,000 acre-feet per year is available from Lake Houston as firm supply. The total supply available from Lake Houston in 2060 (173,000 acre-ft per year) is the sum of the supply available from the original permit (168,000 acre-feet per year) and the additional yield permit (5,000 acre-feet per year).

Lake Conroe

The Lake Conroe yield declined from its permitted amount of 100,000 acre-feet per year to 74,300 acre-feet per year due to the WAM Run 3 condition and the year 2060 storage capacity estimate. The WAM Run 3 assumption that no return flows will be available greatly impacted the streamflows in the lower San Jacinto Basin. Lake Houston is senior to Lake Conroe, which results in Lake Conroe passing inflows when Lake Houston storage levels drop. As a result of the removal of return flows from the model, Lake Conroe passes more inflows in order to keep Lake Houston full. Also, the bathymetric survey used to determine the sedimentation rate for Lake Conroe identifies a potential discrepancy in the original volumetric capacity of Lake Conroe. This discrepancy likely resulted in a higher than actual sedimentation rate, which also reduces the yield over a 60-year period. The COH and SJRA jointly own the water rights for Lake Conroe. The COH's portion is 66,667 acre-feet per year from Lake Conroe, with an estimated year 2060 reliable yield of 49,038 acre-feet per year. The SJRA portion is 33,333 acre-feet per year from Lake Conroe, with an estimated year 2060 reliable yield of 25,262 acre-feet per year.

Entergy (formerly Gulf States Utility Company) has a contractual agreement with SJRA to divert water from Lake Conroe into Lewis Creek Reservoir. In the TCEQ WAM Run 3, this permit is represented as a separate water right. This was corrected in the 2006 Plan and represented as a contract.

3.3.1.5 San Jacinto-Brazos Coastal Basin

Surface supply in the San Jacinto-Brazos Coastal Basin was modeled using Run 3. Water right permits totaling 120,919 acre-feet per year from the San Jacinto-Brazos Coastal Basin were analyzed using the water availability model. Of the 120,919 acre-feet permitted, only 37,569 acre-feet per year was found to be reliable during the DOR. Water rights yielding over 500 acre-feet per year for consumptive uses are listed in *Table 3A.1 of Appendix 3A*, and total 33,051 acre-feet per year. NRG's Webster plant had a permit to divert 4,440 acre-feet per year of saline water. Since 2006 the permit has been canceled at the request of NRG. The Gulf Coast Water Authority (GCWA) owns two water rights in the San-Jacinto Basin including one water right recently acquired from the former Chocolate Bayou Water Company (CBWC). The GCWA water right C5169 was represented in the 2006 Region H Water Plan with a reliable yield of 3,842 acre-ft per year. However, the water right is used for impoundment in the Sugarland area and not as a source to supply water contracts according to GCWA. The GCWA system availability is discussed further in *Section 3.3.1.6*. To reflect this, the availability of the water right recommended in the 2011 Region H Water Plan is 0 acre-ft per year. The reliable yield of water right C5357 was reduced from 17,600 acre-ft per year in the 2006 Region H plan to 15,930 acre-ft per year in the 2011 Plan. The firm portion of this supply is 2,120 acre-feet per year. The WRAP input file for this model is included in the Brazos Basin WRAP input file in *Appendix 3B*.

3.3.1.6 Brazos River Basin

Surface supply in the Brazos River Basin was modeled by the Consultant for the Brazos G Water Planning Group. A survey of wastewater plant operators within the Brazos Basin was conducted to determine the amount of anticipated reuse during the planning period. Based on the survey results, WAM Run 3 was modified to allow 65,256 acre-feet per year (58.3 million gallons per day [mgd]) of return flows in the model in the 2010 decade and 128,503 acre-feet per year (114.7 million gallons per day [mgd]) of return flows in the 2060 decade. There are water right permits in the Brazos River Basin of Region H totaling 866,351 acre-feet per year. The modeled annual reliable yield of these rights was 488,419 acre-feet per year. Water rights yielding over 500 acre-feet per year for consumptive uses are listed in *Table 3A.1 of Appendix 3A* and total 418,311 acre-feet per year. The WRAP input file for this model is included in *Appendix 3B*.

There was a significant reduction in expected yield from the lower Brazos Basin despite the allowance of limited return flows in the model. The largest decline was seen in the Dow Chemical water right, with an authorized diversion of 321,856 acre-feet per year. The reliable yield of this right was reduced from 148,052 acre-feet per year in the 2006 Plan to 137,475 acre-feet per year in the 2011 Plan due to reduced return flows. Similarly, the Brazosport Water Authority water right yield decreased from 23,017 acre-feet per year to 16,492 acre-feet per year. Despite the yield reductions for several water rights in the basin, some firm yields increased. The Richmond Irrigation Company water right was estimated at 29,920 acre-feet per year in the 2006 Region H Water Plan and was not reduced under this model. Similarly, NRG Energy Inc's yield from Smithers Lake remained unchanged at 34,300 acre-feet per year.

The Gulf Coast Water Authority holds three water rights in the Brazos Basin, including a recently purchased water right previously owned by the former Chocolate Bayou Water Company. In the 2006 Region H Water Plan, the combined reliable yield of the three rights was estimated at 235,005 acre-feet per year based on the minimum annual diversion during the drought of record. Under this model scenario, the estimated reliable yield fell to 229,786 acre-feet per year due to lower estimated return flows from the upper basin. The combined firm yield of the three water rights is approximately 78,344 acre-ft per year when analyzed on a monthly basis. This is the result of water

rights C5171 and C5322, which are not reliable during the months of July and August during the Drought of Record.

After discussing the water availability with the GCWA, a monthly analysis of the GCWA contracts and reliable yields was conducted. This allowed the reliable yield of the water rights to be analyzed as a system rather than individually. In addition to the three water rights in the Brazos Basin, the analysis also included reliable yield from a GCWA water right in the San Jacinto – Brazos Basin, water supply contracts from the BRA and existing contracts for future supply from the GCWA. The existing contracts for future supply consist of several contracts that will be available after 2015 once the required infrastructure is constructed to treat additional raw water from the GCWA. A strategy will be developed in *Chapter 4* to allocate the supplies provided to these contracts. The analysis concluded that from the combination of sources, the GCWA was able to provide 256,838 acre-feet per year to meet contractual demands. Of this supply, 198,323 acre-feet per year is supplied from the three run-of-river water rights in the Brazos Basin. The remaining supplies come from a water right in the San Jacinto – Brazos and supplies contracted from the BRA.

Brazos River Authority/U.S. Army Corps of Engineers System (BRA/COE)

The Brazos River Authority stores water in a system of water supply and flood control reservoirs in the middle and upper basins. The Authority owns Possum Kingdom, Granbury, and Limestone Reservoirs. The U.S. Army Corps of Engineers owns the remaining reservoirs in the system. The supply amounts included in *Appendix 3A* for these facilities were provided by the Brazos G Water Planning Group. The combined firm yield of the BRA Reservoirs is estimated at 650,477 acre-feet per year assuming 2010 sedimentation conditions. The portion of this yield available to Region H is reflected in supply contracts between the BRA and customers in this region. Those contracts total 155,030 acre-feet per year.

3.3.1.7 Brazos-Colorado Coastal Basin

The Brazos-Colorado Coastal Basin contains the lower reach of the San Bernard River. The model for this basin was included in the Colorado River WAM, prepared by RJ Brandes Co. for the TCEQ. Two water rights were identified within Brazoria County, and the WAM Run 3 results for these rights are identified in this report. A year 2060 iteration was not made for this basin because sedimentation was not anticipated in the off-channel reservoir associated with these rights. The WRAP input file for this model is included in *Appendix 3B*.

3.3.1.8 Lake Sam Rayburn

A water supply allocated from Lake Sam Rayburn in the Neches River Basin, listed in *Table 3A.1*, represents contracted amounts from the Lower Neches Valley Authority by the Trinity Bay Conservation District, the Bolivar Peninsular SUD and irrigators in Chambers and Liberty Counties. The full yield of the lake was obtained from the East Texas Water Planning Group, and the contract amounts are reflected in both regional plans.

3.3.1.9 Local Supplies

Local supplies (stock ponds, catchments, etc.) that cannot be related to reported groundwater or surface water use are currently meeting certain livestock and mining demands. The TCEQ allows a landowner to impound up to 200 acre-feet of water without obtaining a water right. Numerous local supplies are included as surface water supplies in *Appendix 3A*.

3.3.2 Discussion of Modeling Results

It is important to note that the TCEQ WAMs are based on historic hydrologic data to account for rainfall and evaporation losses. While the model provides an approximation of water right availability

during the drought of record, the model does not predict water right availability in future droughts which may have different hydrologic conditions. The models generally do not include return flows that often increase the reliability of downstream water rights. The reliability of water rights that rely on reservoir storage is also based on assumed sedimentation rates that are projected through the planning period. While this assumption is good for planning purposes, it may not reflect current sedimentation rates. The models also contain assumptions in the internal modeling routines that affect the accuracy of results. Currently, the models are also not able to simulate the interaction between groundwater and surface water supplies.

3.3.3 Surface Water Drought Susceptibility

Within this report, the surface water reservoir and ROR supplies represent firm yield and reliable quantities, respectively. However, surface water is dependent on rainfall, and future droughts cannot be expected to follow the same pattern as the DOR used in the WAM. Therefore, the river authorities and water providers in Region H maintain Drought Contingency Plans prepared under provision of the *Texas Administrative Code, Section 30, Chapter 288* for their respective shares of these supplies. These drought plans are highlighted in *Table 3-7* and tabulated in detail in *Appendix 3D*. While each water provider utilizes unique criteria to define drought stages, their drought contingency plans use a common methodology. A first-stage trigger is used to initiate customer notification systems and voluntary use reductions. A second-stage trigger is used to initiate mandatory use reductions. Finally, a third-stage trigger is used to initiate additional use reductions and/or the suspension of service to some customers.

Table 3-7

Typical Drought Triggers for Region H Supplies

Water Source/ Established By	Drought Type	Trigger Condition and Duration
Lake Livingston – Wallisville System/TRA	Mild	Lake Livingston elevation is <126.50 feet at USGS gage, condition lasts 1 day
	Moderate	Lake Livingston elevation is <124.00 feet at USGS gage, condition lasts 1 day
	Severe	Lake Livingston elevation is <121.40 feet at USGS gage, condition lasts 1 day
Lake Conroe/SJRA	Mild	Elevation <198 feet (85% of storage capacity), condition lasts 1 day
	Moderate	Elevation <190 feet (55% of storage capacity), condition lasts 1 day
	Severe	Elevation <185 feet (40% of storage capacity), condition lasts one day
Houston System Reservoirs/ City of Houston	Mild	Combined storage (Lakes Livingston and Houston) is less than 24 months surface water supply, condition lasts 10 consecutive days
	Serious	Combined storage (Lakes Livingston and Houston) is less than 18 months surface water supply, condition lasts 10 consecutive days
	Severe	Combined storage (Lakes Livingston and Houston) is less than 12 months surface water supply, condition lasts 10 consecutive days
Brazos River at Richmond/GCWA	Mild	12.19 feet or 1700 cfs, condition lasts 1 day
	Moderate	11.93 feet or 1500 cfs, condition lasts 1 day
	Watch	11.65 feet or 1300 cfs, condition lasts 1 day
	Warning	11.23 feet or 1000 cfs, condition lasts 1 day
BRA System Reservoirs/BRA	Watch	For a reservoir/reservoir system, when storage is < Stage 1 Trigger level and could be reduced to Stage 2 Trigger or less during the next 12 months. For the entire Authority system, when the combined storage of the Authority system is < Stage 1 Trigger level and could be reduced to Stage 2 Trigger or less during the next 12 months.
	Warning	For a reservoir/reservoir system, when storage is < Stage 2 Trigger level and could be reduced to Stage 3 Trigger or less during the next 12 months. For the entire Authority system, when the combined storage of the Authority system is < Stage 2 Trigger level and could be reduced to Stage 3 Trigger or less during the next 12 months.
	Emergency	For a reservoir/reservoir system, when storage is < Stage 3 Trigger level. For the entire Authority system, when the combined storage of the Authority system is < Stage 3 Trigger level.

3.3.4 Surface Water Conveyance Systems

Region H contains a number of raw surface water conveyance systems (pipelines, canals, and pump stations). The conveyance systems lie primarily in the coastal river basins in the southern counties of Region H. The main canal systems belong to the COH, CWA, Gulf Coast Water Authority (GCWA), TRA, Lower Neches Valley Authority (LNVA), Chocolate Bayou Water Company (now part of the GCWA), SJRA, CLCND, and Dow Chemical. The information in this section was gathered from each of the entities listed above and the Trans-Texas Water Program Phase I Report for the Southeast Area. These systems are shown in *Figure 3-9*.

The CWA network consists of a main conveyance canal system and a pipeline distribution system. The conveyance system includes the Trinity River pump station, the main canal, the Lynchburg Reservoir, the Cedar Point lateral, the Lake Houston pump station, and the west canal. The Trinity River pump station near Liberty has been expanded to the ultimate design capacity of 1,400 mgd. The main canal runs westerly from the Trinity River pump station about 22 miles to the Lynchburg Reservoir (north of the Houston Ship Channel). The total capacity of the canal is approximately 1,300 mgd from the Trinity River Pump Station to the Cedar Point lateral. Downstream of the Cedar Point lateral, the canal has a capacity of 1,100 mgd. The Lynchburg Reservoir has an impoundment capacity of 4,600 acre-feet. The Cedar Point lateral, with a design capacity of 230 mgd, is located about 8 miles southwest of the Trinity River pump station and diverts water from the main canal southward. The Lake Houston pump station diverts water from Lake Houston into the CWA west canal, which travels southwesterly until it terminates at the COH East Water Purification Plant. The CWA distribution system consists of pressure pipelines that start at the Lynchburg Reservoir with the Lynchburg pump station and extend southwest about 10 miles to the Bayport Industrial Complex and eastward along State Highway (SH) 225 conveying raw water to industrial users and to the Southeast Water Purification Plant (SEWPP).

The GCWA system consists of three main canals that deliver water from the Brazos River to Fort Bend, Brazoria, and Galveston Counties: the American Canal, the Briscoe Canal, and the Galveston Canal System. The American Canal runs parallel to SH 6 southeasterly from the Brazos River lift station (the Shannon Plant, which is 12 miles north of Rosenberg) to Alvin, Texas. The Briscoe Canal runs southeasterly from the Brazos River pump station (the Briscoe Plant, which is 6 miles west of Arcola) to Alvin and then to an industrial complex in southern Brazoria County. The American Canal is connected to the Briscoe Canal by “Lateral 10” just west of Manvel. The Galveston Canal System extends from the old Briscoe system southeast of Alvin to the GCWA Reservoir (four miles east of Dickinson). The Galveston Canal System connects to the American Canal six miles east of Alvin. The Gulf Coast Water Authority has three pump stations: the Shannon Plant with a total capacity of 347 mgd, the Briscoe Plant with a total capacity of 302.4 mgd, and the American Canal’s second lift station located in Sugar Land with a total capacity of 225 mgd.

The GCWA has recently purchased water rights formerly held by the Chocolate Bayou Water Company. The former Chocolate Bayou Water Company distribution system is divided into two sections. The Juliff section, also known as the old South Texas Water system, transports water from the Juliff pump station on the Brazos River near the Fort Bend-Brazoria County border, and the Chocolate Bayou Canal section, which transports water from Chocolate Bayou near Liverpool. The Juliff section has two main canals (the North Canal and the Main Canal) and the Angleton Lateral. This section provides irrigation water to rice farmers and some industrial water to Brazoria County. The Chocolate Bayou Canal section has its main pump station on Chocolate Bayou, but there are additional pump stations on Mustang Bayou and Halls Bayou as well. This section also provides irrigation and industrial water to Brazoria County.

The Dayton Canal is a small system that serves Liberty County. The canal, which diverts from the Trinity River, extends about 20 miles west of the river and has an estimated capacity of 90 mgd.

The Devers Canal System currently delivers irrigation water easterly from the Trinity River to customers in Liberty and Chambers Counties. The main canal system is 81 miles with 125 miles of laterals. Due to the flat grade of the main canal, the flow can be reversed to flow westerly. The system contains two pump stations. The first one on the Devers main canal at the Trinity River has a total rated capacity of 295 mgd, and the second pump station (near SH 563) has a total capacity of 274 mgd. The Devers system has recently been acquired by the Lower Neches Valley Authority (LNVA).

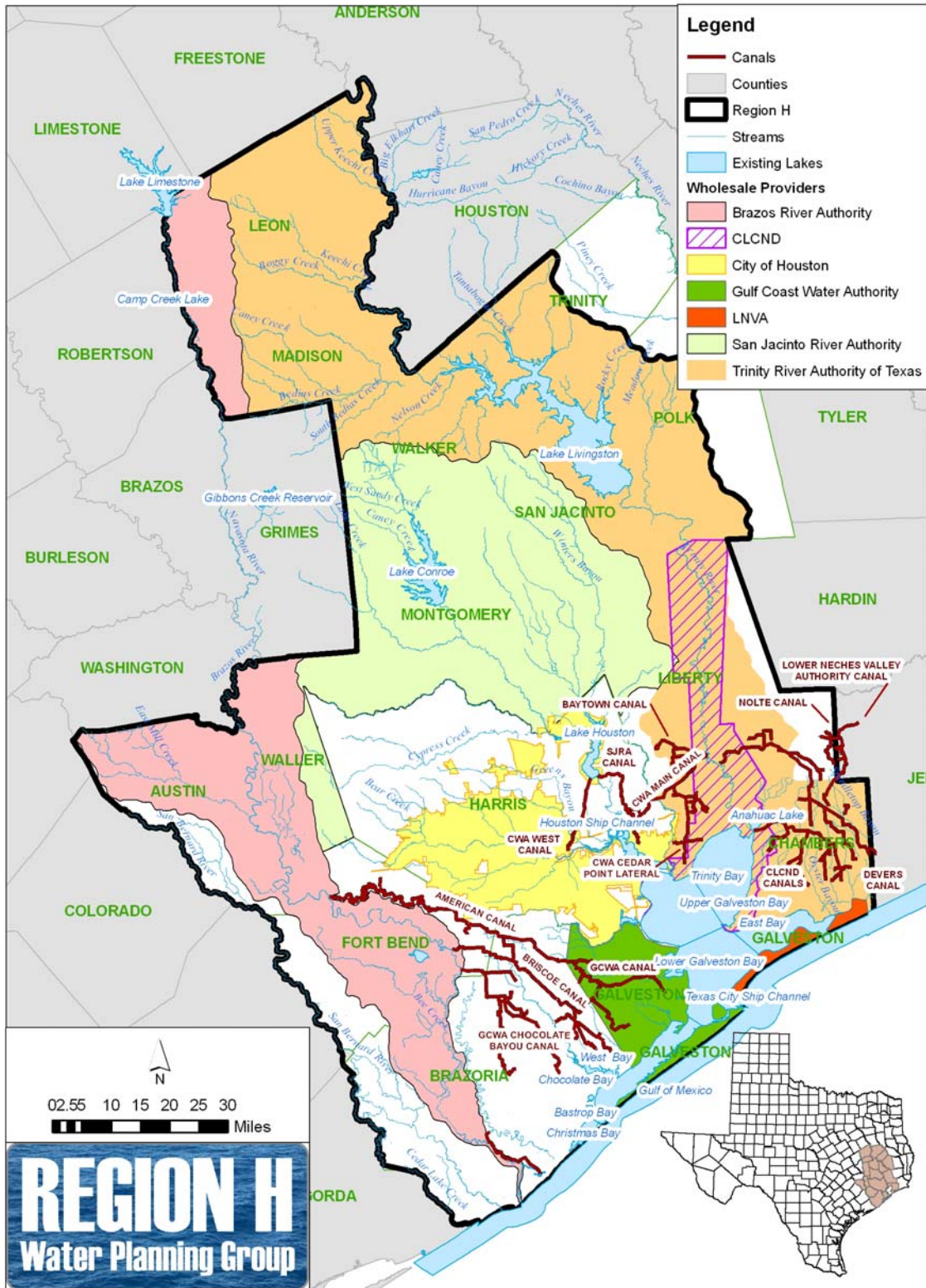
The LNVA system diverts water from the Neches River and Pine Island Bayou and delivers it to customers in Jefferson County, farmers in Chambers and Liberty Counties, and to the Bolivar SUD in Galveston County. The LNVA canal consists of two main canals, the Neches Main and the BI Main. After the junction of the two main canals, the Neches Main travels southwesterly until the Nolte Canal branches off traveling westward into Liberty County. At this point the Neches Main turns and extends southward into Chambers County. The Nolte Canal and the end of the Neches Main are the only sections of the LNVA canal system that extend into Region H. The Nolte Canal is divided into two portions by a check structure. The capacity of the Nolte Canal upstream of the check is 130 mgd and 36 mgd downstream from the check structure.

SJRA provides raw surface water from a point at the Lake Houston dam through its canal system and SJRA's Highlands Reservoir to a point just north of the Houston Ship Channel, providing service to the industrial customers in eastern Harris County. SJRA also contracts with the Coastal Water Authority (CWA) to convey up to 50 MGD of its Trinity Basin water supplies through the CWA Main Canal, and from there to their Highlands System.

The CLCND canal system diverts water from the Trinity River just south of Lake Anahuac. The canal travels easterly and branches to the north and south along the length of the main canal to serve the City of Anahuac and irrigators in Chambers County.

The Dow Chemical Company diverts water from the Brazos River into the Harris and Brazoria Reservoirs in Brazoria County. From Harris Reservoir, water is released into Oyster Creek and rediverted into a canal near Lake Jackson. From the Brazoria Reservoir, water is released into Buffalo Camp Bayou, which joins the Dow canal below the Oyster Creek diversion pump station. The canal travels parallel to the Brazos River and supplies the Brazosport Area Water Authority's water treatment plant before entering the Dow complex just north of Freeport. The canal continues east around Freeport to serve the Dow southern facility.

Figure 3-9
Raw Surface Water Conveyance Systems



3.3.5 Previously Studied Potential Reservoir Sites

In the City and Basin Master Plans within Region H, twenty-four potential reservoir sites have been identified. Of these, five have been identified in the State and Regional Water Plans as reservoir sites of unique value—Allens Creek in the Brazos Basin, Austin County; Little River and Little River Off-Channel in the Brazos Basin, Milam County; Bedias in the Trinity Basin, Madison County; and Tehuacana in the Trinity Basin, Freestone County. Construction of the Allens Creek reservoir and the Little River Off-Channel reservoir was recommended in the 2006 Region H Water Plan. From information provided in existing studies and reports, a summary table listing expected yields, costs, and a brief discussion of potential issues of concern regarding each potential reservoir is included in *Appendix 3E*.

The potential reservoir sites for Region H were reassessed as potential water management strategies for this update to the water plan. That discussion is presented in *Chapter 4*. Also, the sites were again considered for recommendation as reservoir sites of unique value. That discussion is presented in *Chapter 8*.

3.3.6 Legal and Regulatory Factors

A number of legal (institutional) and regulatory factors affect water planning, development, and usage within the Region H area. The most notable of these factors are surface water rights, groundwater conservation districts, interbasin transfer rules, wastewater return flow impacts, and environmental flow requirements.

All of the water included in the analysis of surface water supplies for Region H is obtained under water rights issued through the TCEQ and its predecessor agencies. The larger wholesale water providers hold a substantial portion of the rights available to the region, and these large providers contract to supply water obtained under those rights to various WUGs.

Five groundwater conservation districts exist within the Region H area. These districts are the HGSD, FBSD, Bluebonnet Groundwater Conservation District (includes Austin, Walker, and Waller Counties), Lone Star Groundwater Conservation District (Montgomery County) and Mid-East Texas Groundwater Conservation District (includes Leon and Madison Counties). Each district enacts and enforces groundwater regulations within their respective counties. The specific rules regulating the use of groundwater use were described in the previous section, *Subsidence Effects*. The Harris-Galveston and Fort Bend districts have adopted regulatory plans that limit the withdrawal of groundwater within their respective counties.

The Brown-Lewis Bill (formally Senate Bill 1, 75th Legislature) included restrictions on the interbasin transfer of water. These rules mandate that water supplies obtained by a receiving basin become junior to all other rights in existence within the originating basin of the transfer. This rule applies to all future permits associated with interbasin transfers. As illustrated within this report, a significant quantity of water currently supplied within Region H occurs via interbasin transfers. A portion of the water delivered by all of the larger water providers occurs through some type of interbasin transfer. The most significant of these are the COH and SJRA transfers of Trinity River water into the San Jacinto watershed and the BRA and GCWA transfers of Brazos River water into the San Jacinto-Brazos Coastal Basin. It is anticipated that new interbasin transfers will be needed to support growth throughout Region H, particularly to the San Jacinto and San Jacinto-Brazos Basins where the largest population growth is occurring. Current limitations on interbasin transfers will affect the development of future water resource management strategies.

In the 77th Texas Legislature, the Water Code was amended to remove an obstacle to long-term planning. Under the previous law, any water right that was unused for a period of ten years could be cancelled by the TCEQ, making that water available for diversion under other water rights permits. This is contrary to the state and regional water planning processes, which project demands 50 years

in advance and recommend projects to meet demands 30 years in advance. The amendment to the Water Code exempts certain water rights from cancellation for non-use, including permits obtained as a result of the construction of a reservoir in whole or in part by the permit holder, permits for reservoirs of 50,000 acre-feet or larger, and permits obtained to meet demonstrated long-term water supply or electric generation needs.

Wastewater reuse and reclamation is a water management strategy that is growing in usage within the Texas water industry. Wastewater reuse is the reuse of wastewater prior to its discharge into a receiving stream of the state. These reused quantities can become supply for irrigation, manufacturing, mining, steam-electric power and limited municipal purposes (landscaping, etc.). Wastewater reclamation, however, can affect the reliability of existing surface water rights. In particular, within Region H, one of the greatest potential areas of reuse is within Harris and Montgomery Counties upstream of Lake Houston. Reuse within Region C in the Trinity Basin would impact the yield of Lake Livingston. Thus significant reuse of these flows may affect the water rights of SJRA, TRA, and COH. Indirect reuse permits are increasingly being requested within the state, allowing the use of the bed and banks of the receiving stream to carry treated effluent to a downstream diversion point. Unlike direct reuse, this practice is considered a separate diversion and requires a separate water right permit. These permits typically allow the redirection of a percentage of the discharged volume, with the difference being allocated to meet carriage losses and instream flow requirements. The amount required to be left instream is determined on a site-specific basis by TCEQ.

3.3.7 Environmental Uses and Requirements

Water right permits for environmental use and enhancement may be granted by TCEQ, although there is no use category within the Water Code for meeting environmental needs. These water rights are typically categorized as Recreational or Other. Within Region H, there are fewer than 20 permits for the diversion or impoundment of water for the purposes of wetland habitat creation/maintenance, wetland mitigation, or wildlife conservation. The larger of these permits are listed in *Table 3-8*. Since 1985, environmental flow requirements have been included as conditions within new and amended water rights. These requirements may include a specified minimum instream flow or gauge height threshold for diversions under the permit, or specify a percentage of the diverted amount that must be returned to the source stream. The establishment of these permit conditions requires supporting data on environmental needs of rivers, streams, bays, and estuaries for wetlands habitat. To increase this body of knowledge, the Texas Instream Flow Program was initiated in 2003 as a joint effort between TPWD, TCEQ, and TWDB. A series of studies are funded and underway, and the results will be incorporated in future water rights permitting and regional water planning.

In 2007, Senate Bill 3 took effect beginning the environmental flows allocation process. The process began with the creation of the Environmental Flows Advisory Group and the Texas Environmental Flows Science Advisory Committee to guide the statewide process. Two basin and bay area stakeholder groups have been formed to develop recommendations concerning environmental flow regime, associated policy considerations, and strategies to meet the flow recommendations that will impact environmental flows in Region H. The Trinity and San Jacinto Rivers and Galveston Bay Stakeholders Committee was appointed in July of 2008. The TCEQ is expected to adopt environmental flow standards for the Trinity and San Jacinto Rivers/Galveston Bay by June 1, 2011. The Stakeholder group for the Brazos River/Bay and Estuary Area will be appointed by June 1, 2010 and begin working on recommendations concerning environmental flow regime, associated policy considerations, and strategies to meet the flow recommendations. The TCEQ is expected to approve the group's recommended environmental flow standards by April 1, 2013.

Table 3-8
Major Environmental Water Rights in Region H

Owner	Stream	Use	Diversion (acre-feet/year)
U.S. Anahuac Wildlife Refuge	Oyster Bayou	Anahuac NWR* – wetland habitat	21,000
Texas Parks & Wildlife Department	Carpenters Bayou	Sheldon WMA** – wetland habitat	2,688
U.S. Fish and Wildlife Service	Bastrop Bayou Austin Bayou	Brazoria NWR – fish & wildlife conservation	2,527
U.S. Fish and Wildlife Service	Cedar Lake Creek	San Bernard NWR – wetland habitat	1,086
U.S. Fish and Wildlife Service	Big Slough	Brazoria NWR – fish & wildlife conservation	1,080

*NWR is National Wildlife Refuge
**WMA is Wildlife Management Area

A new provision under the Texas Water Code establishes the Texas Water Trust within the Texas Water Bank. Existing water rights can be placed in the Texas Water Trust to be dedicated to environmental needs, including instream flows, water quality, fish and wildlife habitat, or bay and estuary inflows. While no water rights from Region H have yet been placed in the Texas Water Trust, it can be anticipated that it will figure in further efforts to address both the technical and institutional issues associated with environmental water rights within Region H.

3.3.7.1 Bay and Estuary Inflows

Estuaries are coastal waters where inflowing stream or river water mixes with and measurably dilutes sea water. The Brazos River has a very small estuary, but Galveston Bay is one of the largest and richest estuary systems in the state. Tides along the Region H portion of the Texas Gulf Coast are small (typical ranging up to 2 feet), but their influence is felt far inland due to the flat topography of the coastal plain. Galveston Bay averages a 7-foot tidal depth, so freshwater inflows are important in balancing the tidal intrusion of seawater into the estuary habitat.

The Region H Water Planning Group requested input from the Galveston Bay Freshwater Inflow Group (GBFIG) to address this resource need. GBFIG was established in December 1996 as an ad hoc technical work group. GBFIG includes representatives of major stakeholders in the use of Galveston Bay and its tributaries including all those groups specifically itemized in Sec. 11.1491 of the Texas Water Code for “estuary advisory councils.” Its efforts have been endorsed, and staff participation has been authorized by TWDB, TCEQ, TPWD, and the General Land Office (GLO). GBFIG coordinates with and reports its findings to both the Galveston Bay Estuary Program and RHWPG.

The work of GBFIG builds upon the State Bay and Estuary Studies authorized by the Legislature in 1985 (HB-2) and amended in 1987 (SB-683). On December 31, 1994, *Freshwater Inflows to Texas Bays and Estuaries: Ecological Relationships and Methods for Determination of Needs* was published jointly by TWDB and TPWD. This document details the methodology to be applied in each of seven major estuarine systems. Several draft documents providing historical inflow data (1941-1990) and application of the State’s methodology to Galveston Bay followed. In December 1998, TPWD issued a final *Freshwater Inflow Recommendation by Texas Parks and Wildlife Department for the Trinity-San Jacinto Estuary* (hereafter cited as TPWD 1998).

TPWD 1998 presented output from the State’s optimization model relating freshwater inflows to biological productivity. Based on that analysis of monthly inflow data, several points on a performance curve were identified, ranging from Max Q, the maximum quantity of freshwater falling within the range of analysis, to Min Q, the minimum modeled quantity of freshwater inflow capable of maintaining bay and estuary fishery harvest. The Galveston Bay system receives average annual inflows of about 10 million acre-feet per year (maf/yr), and median twelve-month inflows of just over 7 maf/yr. Because of the uncertainties inherent in analyzing or managing natural processes, TPWD recommended the point of “maximum harvest” (Max H), or a flow of 5.2 maf/yr, as the target inflow for the Galveston Bay system.

Using the data developed by the State, special studies of Galveston Bay freshwater inflows have been performed in conjunction with regional water planning efforts. In April 1998, Brown & Root completed a *Galveston Bay Freshwater Inflow Study* under the Trans-Texas Water Program. Additional modeling by Brown & Root has been performed to address specific analytic needs of GBFIG. The TCEQ WAM program has improved the statistical data and model availability for Galveston Bay. The Region H Planning Group requested more thorough studies of freshwater inflows and impacts of strategies. The 2006 RWP included a study by Kellogg, Brown & Root on the impacts of water management strategies on seasonal frequency. This evolved into a special study in the first phase of the 2011 planning process by AECOM to determine impacts of individual strategies at a frequency greater than the annual frequency previously studied. An additional study, contained in the *Chapter 4* of this Plan, examines impacts of management strategies in conjunction with upstream strategies for each decade of the planning horizon.

Based on information from state and regional studies, GBFIG set about relating its consideration of freshwater inflow needs to the planning task of Region H. GBFIG developed a recommendation that relates target flows under a range of conditions to target frequencies as shown in *Table 3-9*, which generally are less frequent than historical frequency of occurrence. GBFIG specifically noted that development of management strategies for freshwater inflows requires the consideration of quantity, quality, seasonality (monthly flows), and location of inflows and that its own analytic efforts would continue. It also noted that flows available to meet environmental water needs included total flows to the system and, as a result, include some sources outside of Region H. The GBFIG recommendation was accepted for incorporation into the Regional Water Plan in March 2000.

Table 3-9
Environmental Water Needs for Galveston Bay

Inflow Scenario	Quantity Needed (million acre-feet/year)	Historical Frequency	Target Minimum Frequency
Max H	5.2	66%	50%
Min Q	4.2	70%	60%
Min Q-Sal	2.5	82%	75%
Min Historic	1.8	98%	90%

Scenario Descriptions:

Max H: Modeled inflows recommended for maximum bay and estuary fisheries harvest by TPWD.

Min Q: Minimum modeled inflow recommended to maintain the bay and estuary fisheries harvest.

Min Q-Sal: Estimated minimum acceptable inflow recommended to maintain the salinity needed for bay and estuary fisheries viability.

Min Historic: Minimum annual inflow calculated for Galveston Bay over the period of record (1941-1990).

Notes: The health and productivity of Galveston Bay must consider the quantity, quality, seasonality (monthly inflows), and location of inflows. It is anticipated that the inflow needs projections will continue to be refined over time. The use of improved data focusing on the fisheries production solely from the Galveston Bay system is one example of an anticipated means of refinement.

3.3.7.2 Water Quality

The Texas Commission on Environmental Quality (TCEQ) *2008 State of Texas Water Quality Inventory Report* addresses the streams within all Texas river basins by segment. Each segment is described and classified, the designated water uses are identified, and the water quality is determined. This report was reviewed for the river segments in Region H to identify their uses and any existing conditions or concerns. Region H is fortunate not to have naturally occurring chlorides or minerals affecting surface water quality as is the case in some regions, but the effects of development within the watersheds are reflected in the Inventory Report. Some streams and bayous, predominantly in the lower San Jacinto Basin and the San Jacinto-Brazos Coastal Basin, were found to be non-supportive of contact recreation due to elevated bacterial levels. This condition is typically the result of wastewater discharges and urban watershed runoff. Sand mining in the San Jacinto River Basin has increased nutrient loads in the San Jacinto River which can result in an increase in cyanobacteria levels. Basin maps from the *Water Quality Inventory Report* are shown in *Appendix 3F*. A search of the TCEQ Water Rights Database revealed three water rights specifically designated for the improvement of instream water quality (see *Table 3-10*). The largest of these is used for stream quality control in Brazoria County.

Table 3-10
Water Quality Rights in Region H

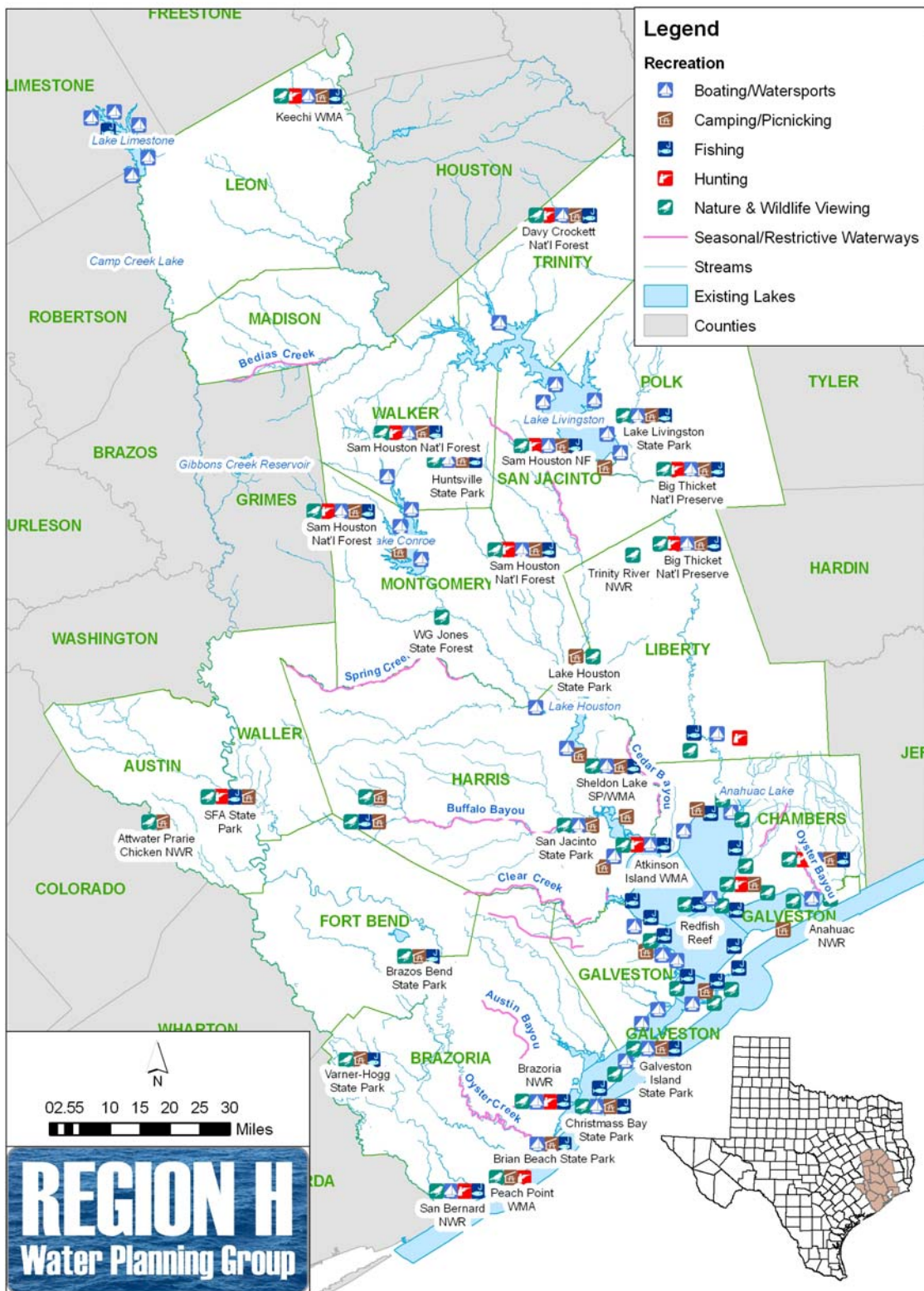
Owner	Stream	Use	Diversion (acre-feet/year)
Dow Chemical Co.	Brazos River	Stream Quality Control	16,000
Paul Weinman	Brazos River	Wetlands	2,448
Cove Creek Corp.	Cove Creek	Water Quality – Flush sewage effluent	967

As with the Galveston Bay estuary, instream salinity is a concern in the flat lower reaches of the Trinity, San Jacinto, and Brazos Rivers. The tidal salt wedge migrates upstream during the drier summer months, threatening the intakes of water right holders. This situation has been addressed on the Trinity River by the construction of the Wallisville Saltwater Barrier, and the Lake Houston dam protects the intake points for the COH and SJRA. The effects of the salt wedge on Brazos River water rights are discussed in *Chapter 4* of this report. *Figure 3-10* depicts the seasonal and restrictive waterways of Region H.

The Texas Parks & Wildlife Department conducted an *Analysis of Texas Waterways: A Report on the Physical Characteristics on Rivers, Streams, and Bayous in Texas*. This 1996 report identifies the seasonal and restrictive waterways:

“those sections of rivers, streams, and bayous... which have been found to contain an insufficient flow of water for recreational use under normal conditions, or for various reasons could not be classified as a major waterway, and would be restricted to seasonal usage”

Figure 3-10
Seasonal and Restrictive Waterways in Region H



3.3.7.3 Unique River and Stream Segments

The Region H Water Planning Group identified eight stream segments of unique ecological value in the 2006 Region H Water Plan. These are Armand Bayou in Harris County; Austin Bayou, Bastrop Bayou and Cedar Lake Creek in Brazoria County; Big Creek in Fort Bend County; another Big Creek in San Jacinto County; Menard Creek in Liberty, Hardin, and Polk Counties and Oyster Creek in Chambers County. Several of these streams are used for irrigation and/or recreational supplies, but these water rights were not included in the total Region H supply due to size or reliability. A full discussion of unique stream segments is made in *Chapter 8*.

3.3.8 Navigational Uses

The Texas Natural Resources Code states that if a water body maintains an average width of 30 feet, it is considered navigable. The Texas Department of Transportation, the U.S. Army Corps of Engineers, and several port authorities share responsibility for maintaining the major navigable waterways within the region. These include the Gulf Intracoastal Waterway, the Houston Ship Channel, and the Lower Trinity River.

The Gulf Intracoastal Waterway is a man-made canal paralleling the Gulf Coast. In Texas, it is 433 miles long, and within Region H it crosses Chambers, Galveston, and Brazoria Counties, serving the Ports of Galveston and Freeport. The system is over 50-years old and the U.S. Army Corps of Engineers maintains the canals through a program of scheduled dredging. The flow in the waterway is brackish and not used for water supply.

The Houston Ship Channel is a deep-draft channel connecting ocean-going vessels with the Port of Houston and industries located along Buffalo Bayou. It begins at the mouth of Galveston Bay and continues north past the Barbours Cut Terminal and Bayport Industrial Complex, into the San Jacinto River and Buffalo Bayou, ending at the Port of Houston Turning Basin. Ship channels serving the Port of Galveston and the Port of Texas City branch off from the main channel on the northwestern side of Galveston Island, and the system connects with the Gulf Intracoastal Waterway at that point as well. The respective port authorities and the U.S. Army Corps of Engineers maintain the ship channels at a depth of 45 feet to serve deep-draft vessels. Although the entire length of the Ship Channel is tidally influenced, there is some concern that the deep dredging may influence the salinity of the shallow Galveston Bay estuary, which averages 7 feet deep, particularly during drought periods.

The Lower Trinity River serves the shallow (6-foot draft) cargo Port of Liberty, Texas. Water depth and freshwater quality is maintained in the Lower Trinity River by the Wallisville Saltwater Barrier, which includes a lock system for navigation. Barge traffic connects from the Port of Liberty to the Intracoastal Waterway by traversing a dredged canal along the eastern coast of Trinity Bay. This canal connects to the Houston Ship Channel west of Smith Point.

Numerous recreational ports serve the region. The Texas Department of Transportation recognizes the Port of Anahuac on the Trinity Bay and the Port of Sweeny on the San Bernard River, although there are many others. These ports are located in tidal areas, and do not require freshwater flows to maintain navigability.

3.3.9 Recreational Uses

Water-based recreational uses in Region H include activities that are directly dependent upon the region's rivers, streams, reservoirs, and bays, such as swimming, boating, fishing, and paddle sports, as well as those enhanced by proximity to water sources such as wildlife viewing, camping and hunting, and eco-tourism. There are also economic activities associated with water-based recreation

such as marinas, tourist accommodation and services, and other recreation-based businesses. Generally, communities developed adjacent to or near accessible water bodies contribute to an increased tax base from which economic benefits can accrue. Positive local tax base impacts in rural communities of Region H have been and can be significant. Therefore, reservoir development in these areas has been viewed as an economic benefit for these regions. Recreational water needs and requirements have two distinct components – physical and economic.

The physical component addresses the amount (volume) of water needed to perform various recreational activities. This is strictly a function of the geometry of whatever body of water is being considered and the type of activity that is being investigated.

In order to provide for this need, some stakeholders in water-related recreational activities apply for permits from TCEQ that allow them to divert and impound water in man-made lakes and ponds dedicated to recreational purposes. A search of the TCEQ Water Rights Database returned 160 records for recreation water rights with total diversion of about 9,200 acre-feet per year. Five of these rights account for 6,572 acre-feet per year in authorized diversions as shown in *Table 3-11*.

Table 3-11
Major Recreational Water Rights in Region H

Owner	Stream	Diversion (acre-feet/year)
Brazos River Club	Brazos River	3,000
Indigo Lake Estates	Log Gully	1,164
C E Zwahr ET AL	Austin Bayou	1,003
George W Maxwell	Cow Island	805
The Woodlands Corporation	Bear Branch	600

The majority of the region’s freshwater recreation occurs not on dedicated recreational lakes, but on water supply reservoirs. The region’s water supply reservoirs provide a broad range of recreational opportunities but were created to meet the region’s consumptive water demands. While recreation is permitted on most of the region’s water supply reservoirs, there are no dedicated recreational water rights protecting volumes for recreational purposes on these reservoirs. Three water supply reservoirs in Region H provide a significant portion of the freshwater-related recreational activities in the region—Lake Livingston, Lake Conroe, and Lake Houston, in decreasing degrees.

The economic importance of water-based recreational businesses is illustrated in recent studies that indicate water-related recreational activities account for a significant portion of the Texas economy. In 2006, Texas residents and non residents spent \$9.2 Billion on wildlife recreation in Texas. Approximately \$4.7 Billion was spent on equipment, \$2.9 Billion on trip expenditures and \$1.6 Billion was spent on licenses, contributions, land ownership/leasing. The 2006 National Survey of Fishing, Hunting, and Wildlife – Associated Recreation reported that there were an estimated 2.5 million anglers in Texas (residents and non-residents), with total expenditures estimated at approximately \$3.2 Billion. The survey also estimated that there were approximately 1.1 million hunters in Texas with expenditures of approximately \$2.2 Billion. The Texas Parks & Wildlife Department reported in 2008 that approximately 595,000 boats (6th nationally in boat ownership) are registered in the state, 99 percent of which are used as pleasure craft. Counties in Region H account for nearly one-quarter of these.

While there is a direct relationship between lake levels and these industries, there is no statistical data available to quantify that relationship. Although anecdotal information suggests negative impacts will accrue to lakeside communities when reservoir levels decrease, there is no economic

data available which would allow a comparison to the economic impacts of not meeting municipal, manufacturing and/or irrigation water demands. When considering the impacts of lake levels, one might consider (1) water levels required to operate boat ramps and docks, (2) water levels or depths required to support water recreational activities (boating and fishing), and (3) water levels required to support resident and migratory wildlife. Also important to consider is the acceptable duration of a given condition. Lake levels will decline during droughts, but recover during average-to-wet years. Resident wildlife species will be directly affected by the drought conditions. Migratory species would be indirectly affected, because they would be able to adjust their routes to find the best habitats in a particular year.

All state parks and forests, national parks and forests, wildlife refuges, and wildlife management facilities were identified in order to consolidate a listing of recreational resources in Region H. Every facility was researched to determine if it provided facilities for camping and picnicking, nature and wildlife viewing, hunting, fishing, and boating and other water sports. Sources include various websites and publications from the Texas Parks & Wildlife Department, National Park Service, USDA Forest Service, U.S. Fish and Wildlife Service, National Wildlife Refuge System, Galveston Bay National Estuary Program, U.S. Army Corps of Engineers, U.S. Historical Society, Great Outdoor Recreation Pages, Recreation.Gov, 1998-1999 *Texas Almanac*, Texas road atlases, and various county and river authority websites. Additional information was acquired from the Houston Canoe Club on areas within the region of importance to paddle sports. This information was compiled into the following three tables contained in *Appendix 3G*.

Region H-River Segments, Bay and Estuaries – Lists all of the river basins, river segments, bays, and estuaries in the region and the recreational opportunities associated with each.

Recreation – Lists all of the national parks, preserves, wildlife refuges, state parks, wildlife management areas, and forests and the recreational opportunities associated with each.

Region H-River Segments, Bay and Estuaries-Special Features – Lists all of the lakes and reservoir segments in the region and the recreational opportunities associated with each.

From the tables containing the public recreational sites and data obtained from the *Galveston Bay Recreational User's Handbook*, *Figure 3-10* was prepared to illustrate the location and each associated recreational activity for Region H. This map also shows the seasonal and restricted waterways within the region. *Appendix 1A* contains a detailed bibliography of all of the sources used for this section.

3.4 Total Water Supply

The total amount of water supply currently available to Region H from existing available water sources is 3,556,538 acre-feet per year. Of that, approximately 75 percent is surface water. By the years 2030 and 2060, the available supply is expected to be 3,343,151 acre-feet per year and 3,411,210 acre-feet per year, respectively. *Table 3-12* below summarizes current and projected water supplies.

3.4.1 Water Supplies Available by City and Category

This water supply is distributed to each WUG, i.e. each city, each county-other, and each non-municipal water use category. This distribution is shown in *Table 3H.1*, located in *Appendix 3H*.

In *Table 3H.1*, the ground and surface water supply sources available to Region H are assigned to the various WUGs in the region based on contracts and water rights, limitations of conveyance facilities, and in some cases, current usage patterns. In general, a thorough search was performed to determine how each WUG obtained its water supply. This required identification of third-party contracts as well as water providers in addition to the wholesale water providers (WWPs).

About 72 percent of the year 2010 total available Region H supply is allocated to the region through one of the WWP. *Table 3-13* shows the distribution of the available supply among the providers for the study years of 2010, 2030, and 2060.

Table 3-12

Summary of Water Supply Available for Region H for Study Years 2010, 2030, and 2060

Supply Source	Supply Available (acre-feet/year)		
	Year 2010	Year 2030	Year 2060
Groundwater			
Gulf Coast Aquifer	812,709	685,529	685,843
Carrizo-Wilcox Aquifer	10,493	9,756	9,610
Queen City Aquifer	7,906	7,906	7,906
Sparta Aquifer	17,414	17,414	17,414
Brazos River Alluvium	41,539	41,539	41,539
Yegua-Jackson Aquifer	6,400	6,400	6,400
Undifferentiated Aquifer	1,117	1,117	1,117
Subtotal	897,578	769,661	769,829
Surface Water			
Neches River Basin ¹	63,863	63,946	64,177
Neches-Trinity Coastal Basin	21,754	21,754	21,754
Trinity River Basin	1,568,530	1,489,530	1,568,530
Trinity-San Jacinto Coastal Basin	34,313	34,313	34,313
San Jacinto River Basin	321,800	314,000	302,300
San Jacinto-Brazos Coastal Basin	33,051	33,051	33,051
Brazos River Basin ²	573,081	573,278	573,342
Brazos-Colorado Coastal Basin	12,019	12,019	12,019
Local Supplies, all basins	30,549	31,599	31,895
Subtotal	2,658,960	2,573,490	2,641,381
Total	3,556,538	3,343,151	3,411,210

¹ Supplies include 63,863 acre-ft per year of firm water currently contracted from upstream LNVA to Region H customers. Total LNVA supply is greater but may not be available to Region H.

² Supplies include 155,031 acre-ft per year of firm water currently contracted from BRA system reservoirs to Region H customers. The total BRA supply is greater but is not available to Region H. The remaining Brazos River Basin supply is comprised of Lower Brazos Basin permits owned by Dow Chemical, GCWA, NRG, Brazosport Water Authority, and private irrigators.

Table 3-13

Available Supply by Wholesale Water Provider within Region H for Study Years 2010, 2030, and 2060

Provider	Supply (acre-feet/year)		
	Year 2010	Year 2030	Year 2060
Baytown Area Water Authority	17,534	17,534	17,534
Brazos River Authority*	155,031	155,031	155,031
Brazosport Water Authority	16,492	16,492	16,492
Chambers-Liberty Counties Navigation District	76,520	76,520	76,520
Central Harris County Regional Water Authority	5,651	3,662	3,662
Clear Lake City Water Authority	26,876	26,876	26,876
Dow Chemical ¹	137,475	137,475	137,475
Fort Bend County WCID 1	5,634	5,634	5,634
Fort Bend County WCID 2	8,654	7,387	7,375
Galveston County WCID 1	3,541	3,541	3,541
Gulf Coast Water Authority ²	192,687	214,190	214,254
City of Houston	1,264,231	1,203,528	1,254,628
City of Huntsville	27,686	27,640	27,567
Lower Neches Valley Authority*	63,863	63,946	64,177
Missouri City	25,534	18,999	18,985
North Channel Water Authority	8,355	8,332	8,327
North Fort Bend County Water Authority	35,009	48,077	48,077
North Harris County Regional Water Authority	115,957	65,272	65,272
NRG ³	94,220	94,220	94,220
Richmond - Rosenberg	14,908	11,779	11,779
City of Pasadena	40,561	40,561	40,561
San Jacinto River Authority	245,244	240,244	232,744
Trinity River Authority	403,200	379,500	403,200
City of Sugar Land	32,844	22,537	21,590
West Harris County Regional Water Authority	65,692	36,958	36,958
Total	3,083,399	2,925,935	2,992,479

*Supplies represent current contracts to Region H with the assumption that the contracts will be extended and maintained through 2060. Total supply is greater but may not be available to Region H.

¹ Dow Chemical supplies do not include 16,000 acre-feet per year contracted from BRA

² GCWA supplies do not include 44,980 acre-feet per year contracted from BRA.

³ NRG supplies include Richmond Irrigation water rights. NRG supplies do not include 83,000 acre-feet per year contracted from BRA.

3.4.2 General Methodology for Assigning Resources to WUGs

The following methodology summarizes the data collection process and the other procedures followed to arrive at the information in *Appendix 3H*. In general, the methodology includes the following steps.

Data Collection

- Identify contract supplies available to WUGs via a direct or multi-tier transaction with a WWP using contract information from WWPs and the 2006 Regional Water Plan.
- Coordinate with other planning regions to resolve interregional conflicts, where applicable. No interregional conflicts were identified during discussions with regions C, G, and I.
- Identify other possible water providers, using the TWDB Water Use Database and any other available information. Identify the end user WUGs that are supplied by these providers under a contractual or retail agreement. Contact these providers, and request contract information from them.
- Identify surface water supplies being used by self-supplied WUGs, by consulting the TCEQ Water Rights Database and *Table 3A.1*.
- Update information for water providers identified in the 2006 Regional Water Plan.

3.4.3 Groundwater Allocation

Groundwater supplies in Leon and Madison Counties were allocated according to information received from the Mid-East Texas Groundwater Conservation District. Groundwater supplies in Harris, Galveston, and Fort Bend Counties were allocated in accordance with the groundwater reduction goals provided by the Harris-Galveston Subsidence District (HGSD) and the Fort Bend Subsidence District (FBSD). In Brazoria County, groundwater supplies were allocated based on historic pumpage. In Liberty County, groundwater was first allocated to non-irrigation WUGs. The exceptions are described in more detail below. Generally, where groundwater resources were not adequate to meet demands, supplies were distributed to WUGs based on total demand. Any exceptions to this rule are noted below.

3.4.3.1 Counties With Adequate Groundwater Resources

The available groundwater supplies in Austin, Leon, Madison, Polk, San Jacinto, Trinity and Walker Counties were found to be adequate to satisfy the groundwater demands of WUGs for the planning period.

Water was allocated to WUGs in Leon and Madison Counties and was allocated with guidance provided by the Mid-East Texas Groundwater Conservation District. The plan set forth by the district shows the amount of water allocated from each source to individual customers including irrigation, livestock, manufacturing, and mining users. These values were adjusted, within reasonable limits, to minimize shortages.

3.4.3.2 Counties With Inadequate Groundwater Resources

Brazoria County

Brazoria County has municipal, manufacturing, mining, irrigation, and livestock water demands that cannot be entirely satisfied by surface water and groundwater resources. The groundwater availability of approximately 50,400 acre-feet per year can satisfy part of the water needs but not all of

the needs in the county. The communities of Jones Creek, and West Columbia were allocated groundwater to meet their entire demands while others were supplied groundwater in addition to surface water supplies. Adequate groundwater was also budgeted through 2060 to supply the Brazoria County MUDs, Bailey's Prairie, Brookside Village, Danbury, Hillcrest, Holiday Lakes, Iowa Colony, Orbit Systems Inc., Southwest Utilities, Surfside Beach, Sweeny, and Varner Creek UD entirely from groundwater. After meeting the groundwater demands of these WUGs, the remaining groundwater supply was allocated among users that were connected to surface supplies as well as groundwater.

The City of Brazoria was capable of providing for all of its demands through 2060 by using surface water supplies and was not allocated any of the county's groundwater resources. Alvin, Angleton, Clute, Freeport, Oyster Creek, Manvel, Pearland and Richwood develop shortages in either 2020 or 2030. Supplies to irrigation in the Brazos River Basin are anticipated to be insufficient to meet demands beginning in 2010. Manufacturing shortages in the Brazos and San Jacinto-Brazos River Basins begin in 2010 and 2020, respectively. Livestock demands that were not met by this groundwater supply were assumed to be provided by local water supplies in 2010. Mining shortages are expected to occur in 2020.

Chambers County

Chambers County will experience groundwater shortages immediately in the 2010 planning period without the use of surface water supplies to meet its municipal, irrigation, manufacturing, mining, and livestock demands. Throughout all of the planning periods, the county will not be able to rely on groundwater supplies alone. Groundwater resources were distributed to each WUG receiving groundwater according to total demand.

Galveston and Harris Counties

Groundwater was allocated in Galveston and Harris Counties in accordance with regulations established by HGSD which provide for reductions in groundwater pumping in these counties based on a percent of total demand over the planning period. The groundwater reductions vary depending upon the Subsidence District area where the WUG is located.

WUGs located in Subsidence District Area 1 were limited to groundwater usage equal to 10 percent of their total demand for all planning periods from 2010 to 2030. For 2040 through 2060, the 2030 groundwater allocation was carried forward. In Area 2, WUG groundwater usage was limited to 20 percent of their total demand for the planning periods 2010 to 2030. For 2040 through 2060, the 2030 groundwater allocation was carried forward. Maximum groundwater usage for WUGs located in Area 3 varied by planning period. The maximum allowable groundwater use for 2010 was calculated to be 70 percent of the total water demand for the period, for each WUG. For 2020, this percentage was decreased to 30 percent. For 2030 and subsequent decades, only 20 percent of the total water demand could be met with groundwater sources. Steam Electric and Mining WUGs were first allocated surface water supplies followed by groundwater until the remaining demand was satisfied, or the regulatory limit was reached.

Shortages from insufficient supply begin in the San Jacinto River Basin of Harris County in 2010 due to groundwater restrictions. Before this time, shortages are due to groundwater restrictions. In the San Jacinto-Brazos and Trinity-San Jacinto Coastal Basins of the county, groundwater shortages through 2060 only occur due to groundwater pumping restrictions and not from limited supply. Municipal WUGs in Galveston County will experience shortages due to restrictions rather than limited supplies for all of the planning periods. In the Neches-Trinity Coastal Basin, only livestock and mining WUGs are served by groundwater, and these users will experience shortages due to groundwater restrictions.

In instances where groundwater supplies were not adequate to meet groundwater demands or restricted groundwater demands, the amount supplied was prorated among the WUGs based on restricted demand, or total demand, if no restrictions applied.

Fort Bend County

Similar to the subsidence restrictions imposed upon Harris and Galveston Counties by HGSD, the FBSD regulates the quantity of groundwater pumpage in portions of Fort Bend County. However, these restrictions only apply to two zones in the northeastern portion of the county. The FBSD regulations also do not align with the planning decades; surface water conversion dates in 2013 and 2025 require groundwater users in Fort Bend County to reduce groundwater pumpage to 70 percent and 40 percent of total demand respectively. For the 2010 planning period it was assumed that each WUG could pump groundwater in order to satisfy 100 percent of the total 2010 demand. For the 2020 planning decade it was assumed that both zones would be required to lower pumpage to 70 percent of the total demand for each WUG. For the 2030 period, it was assumed that only 40 percent of the total WUG demands could be met by groundwater. For the planning periods 2040 through 2060, the 2030 ground water supply volumes were carried forward. These limitations were not applied to irrigation usage within the county, which were allocated sufficient groundwater supplies in order to provide for irrigation demands remaining after surface water contracts were allocated. Steam Electric and Mining WUGs were first allocated surface water supplies, and then groundwater until the remaining demand was satisfied, or the regulatory limit was reached.

The groundwater restrictions imposed by FBSD are not sufficient to prevent shortages due to supply from 2010 to 2060. The available amount of groundwater was distributed to WUGs according to their demands or restricted demands, where applicable. It was assumed that all groundwater demands to irrigators could be met by groundwater after applying existing surface water contracts. The FBSD restrictions do not apply to irrigators and small domestic wells and it is assumed that these users would pump the amount of water necessary to meet their demands. Therefore, the total available groundwater supplies were increased to accommodate the additional water usage by irrigators, as well as other unregulated WUGs, such as Pleak, that were not subject to subsidence restrictions.

Liberty County

Irrigation demands in Liberty County are of considerable magnitude. For this reason, groundwater was first provided to nonirrigation WUGs. The remaining groundwater was allocated to irrigation based on demand. Shortages appear in the 2010 period for irrigation in the Neches, Neches-Trinity, and Trinity San Jacinto River Basins. However, surface water supplies are adequate to prevent irrigation in the Trinity River Basin from experiencing further shortages until 2020.

Montgomery County

Available groundwater supplies are projected to be inadequate to meet demands in Montgomery County beginning in the 2010 planning period. The Lonestar Groundwater Conservation District established conversion requirements to limit groundwater withdrawal in Montgomery County to 64,000 acre-feet per year. To meet initial conversion requirements in 2015 more populated communities, most notably Conroe and the Woodlands, will be over-converted to surface water while smaller communities will remain on groundwater. For conversions after 2015, 2045 projected water demands were used to determine the WUGs that would be converted to surface water. Groundwater was initially allocated proportionally to municipal WUG demands, first to WUGs that were not converted to surface water then to WUGs that were anticipated to be converted before each planning period. The WUGs Consumers Water Inc, Crystal Springs Water Company, Magnolia, Montgomery County UD 2 & 3, Montgomery County WCID #1, New Caney MUD, Patton Village, Point Aquarius MUD, Porter WSC, Roman Forest, Southwest Utilities, Splendora, Stagecoach and Woodbranch were assumed to remain on groundwater supplies from 2010 to 2060. The mining water demand remaining after including surface water contracts was fully met by groundwater supplies. Livestock

demands were met entirely from local supplies and groundwater. The small irrigation demand in Montgomery County was supplied by surface water contracts from SJRA and groundwater supplies.

Waller County

The groundwater resources of Waller County were allocated for municipal, manufacturing, mining, irrigation, and livestock based on the groundwater available for the county. The estimated demands for groundwater within the county can be met with available groundwater supplies, Municipal and irrigation conservation and groundwater supplies from Harris County. Katy, which receives groundwater from Harris County, is assumed to remain on groundwater due to participation in the West Harris County Regional Water Authority groundwater reduction plan.

3.4.4 Surface Water Allocation

- The values entered into *Appendix 3H* for municipal WUGs are the surface water supply identified from WWP's and smaller water providers.
- It was assumed that the COH provided enough water to meet its remaining surface water demands and existing contracts for surface and groundwater.
- Contracts from GCWA were found to exceed the total of the WWP's contracts from other providers and water rights. Because of this, existing GCWA contracts and supplies were analyzed on a monthly basis and annual allocations were lowered accordingly.
- As a general rule, if a WUG is found in different counties, the supply allocated to the WUG in each county was split based on the surface water demand. In cases where this demand was "0," the supply was split equally between these counties. (The surface water demand for each entry WUG/county/basin was calculated by subtracting the allocated groundwater for that entry from that entity's total demand).
- Municipal contracts that were not identified as a municipal WUG were assumed to be a portion of County-Other and assigned to the appropriate county and basin unit.
- For non-municipal WUGs, contracts from water providers were used to determine contractual sources to various categories. Wherever possible, each contract was associated with a basin through available information.
- For non-municipal WUGs, some information was received from water rights information collected in the previous steps and entered in *Table 3A.1* on a WUG/county/basin basis. Ownership and use information for the available firm supplies was provided by the TCEQ Water Rights Database.
- Irrigation entries were compiled from contracts and firm water rights described later in this chapter.
- Livestock entries assumed livestock demands would be provided from local surface water supply sources. This is consistent with past Regional Water Planning procedures.
- In the 2006 Plan, mining WUGs with shortages in the year 2000 were assumed to be supplied from local surface supplies equal to their shortage. This amount was also carried out for the remaining planning periods. The 2011 Plan will adopt the amount identified in the 2006 Plan.

Data Collection

Entities that sell water to WUGs in the region were contacted in order to obtain an up-to-date list of their water commitments. This procedure was repeated at each tier of subsequent transactions until all of the contract water supplies provided by non-major water providers could be tracked to an end user, identified as a WUG or part of a WUG.

The remaining water supplies that were entered in *Table 3H-1* are other permit amounts or assumed local supplies. These entries are generally non-municipal users. Moreover, with the exception of livestock and mining supplies, the only noncontract supplies that were considered for *Table 3H-1* are the supplies associated with the records listed in *Table 3A-1*.

Supply Allocation

After the data collection process was completed, the contract and non-contract supplies were allocated to each WUG on a county/basin basis. If a portion of the water acquired through a contract by a WUG was provided to another WUG, through a contract or direct retailing, or by using another intermediary seller, the amount associated with the initial WUG was modified accordingly to avoid double accounting of water. Within each category (county-other, manufacturing, mining, steam-electric, livestock, irrigation), all entities receiving water directly from the same source or obtaining water via contracts from the same provider/self provider and from the same source were aggregated into a single record.

Non-municipal contract supplies were allocated to a specific county/basin unit where possible. This involved the determination of the correct county and basin location for each recipient. Use of the historical data from the water use reports provided by TWDB was instrumental in this process. For example, the COH WWP currently has a wholesale contract with the manufacturing entity, Dixie Chemical Company. It was found that Dixie Chemical is using the water in Harris County in the San Jacinto-Brazos River Basin. Therefore, the current contract supply amount for Dixie Chemical would be added to the overall manufacturing supply available in Harris County, in the San Jacinto-Brazos Basin, and receiving water from the same source (in this case, Lake Livingston).

The allocation of the municipal contract supplies was more complex. Most of the water providers that receive water via a wholesale agreement have retail customers that are in their service areas. Retail customers are defined here as those recipients of water that pay for their service through some means other than a wholesale agreement (i.e., monthly billings). There is not a well-defined methodology for determining the amount of water available to these types of users. For the most part, the availability of water for these WUGs at the city/county level was assessed on a case-by-case basis. For those municipal WUGs that were divided into more than one basin, the availability to each basin was based on the basin's proportionate share of the city/county surface water demand.

For water rights for irrigation that were not found to be sold through contract, such as irrigation rights owned by individuals, the entire supply was allocated to irrigation. Irrigation contracts were used, where available, to determine what portion of a water provider's water right was actually sold for irrigation use. Most of the irrigation supplies are year-to-year contract supplies that are allocated differently with each growing season. For the most part, providers of irrigation water sell water to irrigators in their immediate vicinity. It was assumed that irrigation water rights provided water to the basin in which they originated unless known contracts allocated the water to another location. Contracted water supplies for irrigation were assumed to serve customers along the canal system in which it was conveyed.

The 2006 Plan assumed that livestock demands not met by groundwater were supplied by water available from local surface supply sources (i.e., stock ponds). Much of the mining demand for surface water also appeared to be supplied from local sources. However, it was assumed that these supplies would not increase in quantity over the planning period and alternative sources would be required to supplement any growth in demand. The year 2000 local supply quantity was held

constant through the year 2060. The 2011 Plan will retain the local supply volumes recommended in the 2006 Plan.

3.4.4.1 Municipal Contracts Allocation

Anahuac

The City of Anahuac receives 1,105 acre-feet per year from the CLCND. This amount was split between the Neches-Trinity and Trinity River Basins based on the surface water demand ratios, by basin.

Angleton

The City of Angleton receives approximately 2,016 acre-feet per year from Brazosport Water Authority (BWA) (nonmajor water provider), and provides 202 acre-feet per year (approximately 10 percent) to manufacturing in the Brazoria County/San Jacinto-Brazos Basin (assumed that the split is for the entire length of the contract between City of Angleton and BWA). The amount remaining for the City of Angleton is 1,815 acre-feet per year.

Bacliff MUD

Bacliff MUD is contracted to receive 1,373 acre-feet per year from GCWA for municipal use.

Bayou Vista

Bayou Vista receives 519 acre-feet per year from GCWA.

City of Baytown

Baytown Area Water Authority (BAWA) receives 17,534 acre-feet per year from COH and provides water to several water supplies and to the City of Baytown. BAWA provided information regarding the amounts distributed to each of its customers. It was assumed that the BAWA customers Fresh Water Supply District 1-A, Harris County Fresh Water Supply District 1-B, Harris County Fresh Water Supply District 27, Lake MUD, Country Terrace, and Cedar Bayou represent county-other in the Trinity-San Jacinto Basin. The allocation of BAWA's contract is shown below.

- Baytown 15,934 ac-ft/yr
- Harris County WCID 1 784 ac-ft/yr
- Harris County-Other (Trinity-San Jacinto) 816 ac-ft/yr

The amount of water that the City of Baytown receives was calculated based on the surface water demand. The part of Baytown located in Harris County is also located in two different basins, Trinity-San Jacinto and San Jacinto. The amounts entered in these basins were prorated based on the surface water demands.

Bellaire

Bellaire receives 1,310 acre-feet per year of blended surface water and groundwater from the COH. As the groundwater reduction plan for the area progresses the amount of groundwater used will decrease significantly. The entirety of this contract was assumed to be made up of surface water and was allocated to municipal use.

Bolivar Peninsula SUD

Bolivar SUD contracts to receive 5,550 acre-feet per year from LNVA. It was assumed that 1 acre-foot per year of this contract could be used to provide water to county-other in the Neches-Trinity basin, leaving 5,549 acre-feet per year available to Bolivar SUD. The contracted supply is projected to decrease from 5,550 acre-ft per year in 2010 to 5,300 acre-ft per year in 2060.

Brazoria

Brazoria has a contract with BWA for 336 acre-feet per year, and the entire contract was allocated to the City of Brazoria. The City of Brazoria is located in two different basins, the Brazos and Brazos-Colorado. The contract amount was prorated between these two basins based on the total water demand ratios for these two basins.

Bunker Hill Village

The COH provides 635 acre-feet per year of blended water to Bunker Hill Village. This entire supply was allocated as surface water as the portion of this supply from surface water will increase throughout the groundwater reduction plan.

Chimney Hill MUD

Chimney Hill MUD receives water under a contract from the COH. COH provides 426 acre-feet of groundwater/year to the MUD, and it was assumed the groundwater was obtained from the San Jacinto River Basin.

Clear Brook City MUD

The Clear Brook City MUD receives 1,680 acre-feet per year from the COH for municipal use. The MUD is a partner in the Southeast Water Purification Plant.

Clear Lake Shores

Based on information received from Galveston County WCID 12, this water provider serves Clear Lake Shores, Kemah, Lazy Bend (county-other), and a small number of customers in League City. Water provided to Kemah is sold wholesale to the City of Kemah, and then to other customers. All other sales by the district are carried out directly between WCID 12 and the customer. The WCID 12 contract from GCWA was split between Kemah and other customers in the district according to the ratio of usage between Kemah and WCID 12. The portion of water allocated to WCID 12 was further divided among Clear Lake Shores, League City, and county-other according to the number of connections served in each community. League City also receives a majority of its water from the GCWA. The resulting volumes for each WUG are:

- Kemah 64 ac-ft/yr
- League City (Galveston County) 13 ac-ft/yr
- Lazy Bend (WCID 12) 799 ac-ft/yr
- Clear Lake Shores 155 ac-ft/yr

Central Harris County Regional Water Authority (CHCRWA)

CHCRWA has a contract with the COH for 2,375 acre-feet per year.

Clute

The City of Clute has a contract with BWA for 1,120 acre-feet per year; the entire contract was allocated to City of Clute.

County-Other in Brazoria County

BWA has contracts with Clemens Unit-TDCJ and Wayne Scott Unit-TDCJ for 420 acre-feet per year. The demands of these units were considered part of the county-other demand; therefore, since these units are located in Brazoria County, they were allocated to county-other in Brazoria County. The portion for the Clemens Unit was allocated to the Brazos-Colorado Basin while the Wayne Scott Unit supply contract was allocated to the San Jacinto-Brazos River Basin.

County-Other in Fort Bend County

Fort Bend County WCID 2 has an option contract with GCWA for 11,762 acre-feet per year. This contract was reduced so that GCWA contracts did not exceed supplies. Based on the information received from the contacted person, this amount, if used, would be split among its customers. Since GCWA provides retail water to its customers, an exact amount is difficult to estimate; therefore, GCWA estimated the amounts for each entity listed below:

- Missouri City 87 ac-ft/yr
- Sugar Land (San Jacinto-Brazos River Basin) 30 ac-ft/yr
- Harris County MUD 122 (assumed
Harris County-other, San Jacinto River Basin) 195 ac-ft/yr
- Fort Bend County, unincorporated area
(assumed Fort Bend County-other,
San Jacinto-Brazos River Basin) 73 ac-ft/yr
- Stafford 6,194 ac-ft/yr

The amount indicated for Stafford and Missouri City was divided by basin and county according to surface water demand.

County-Other in Harris County

Several water providers including WWP's provide water to county-other in Harris County. These contributions are described below.

The provider with the alpha number 1095 in *Appendix 3H* is the La Porte Area Water Authority (LAWA). LAWA has a contract with COH for 8,734.6 acre-feet per year. According to the information received from LAWA, LAWA provides water to the cities of La Porte, Shoreacres, and Morgans Point. The volumes of water are shown below.

- Shoreacres 406 ac-ft/yr
- Morgans Point (entered as Harris County-Other) 688 ac-ft/yr
- City of La Porte 8,656 ac-ft/yr

As Morgans Point resides within both the San Jacinto and San Jacinto-Brazos River Basins, the water provided to county-other was split based on area. Because Morgans Point is divided fairly equally by the two basins, the 616 acre-feet per year was split in half.

North Channel Water Authority receives 6,682 acre-feet per year from COH that can be split among its customers. A summary of water usage for several years was provided by NCWA and used to prorate the COH contract amount among NCWA customers on a basis of their total water use. Municipal users that were not listed as individual WUGs were combined into county-other. The amount of contract water allocated to each WUG is shown below.

• Harris County FWSD 6	187 ac-ft/yr
• Harris County FWSD 47	288 ac-ft/yr
• Harris County FWSD 51	1,539 ac-ft/yr
• Harris County MUD 53	836836 ac-ft/yr
• Harris County WCID 21	913 ac-ft/yr
• Harris County WCID 36	802 ac-ft/yr
• Harris County WCID 84	310 ac-ft/yr
• Pine Trails Utility	480 ac-ft/yr
• County-Other	281 ac-ft/yr
• Manufacturing	1,046 ac-ft/yr

The City of Pasadena receives water from COH, and it is one of the Southeast Purification Plant participants. Contract information was not available from the City of Pasadena and therefore information used in the 2006 Region H Regional Water Plan was used for the current plan. Based on the information received from the City of Pasadena for the 2006 Regional Water Plan, its customers are City of Seabrook (which in turn provides some of this water to the City of El Lago), manufacturing companies located in Harris County (San Jacinto-Brazos River Basin), and Clear Lake City Water Authority (CLCWA). These amounts are shown below.

• Seabrook and El Lago	1,120 ac-ft/yr
• County-Other	3,360 ac-ft/yr
• Manufacturing	5,040 ac-ft/yr

The remaining supply from Pasadena was assumed to be available to satisfy the demands of the City of Pasadena.

The Fort Bend County WCID 2 contract allocation was described under county-other in Fort Bend County. The amount allocated to county-other in Harris County is 349 acre-feet per year.

Baytown Area Water Authority provides water to several communities in Harris County that are not listed as WUGs. This water was allocated to Harris county-other. The BAWA contract allocation is described under Baytown.

Municipal customers of the COH that were not itemized as WUGs were combined into county-other, based on the customer's location. COH provides groundwater to the San Jacinto, San Jacinto-Brazos, and Trinity-San Jacinto River Basins for use by county-other WUGs.

County-Other in Galveston County

The 275 acre-feet contract between GCWA and Bayview MUD was allocated to county-other in Galveston County. The COH has a contract to supply Galveston County with 18,477 acre-feet per year for municipal use and it was assumed that this amount provided supply to the portion of Galveston County in the San Jacinto-Brazos basin. It was also assumed that the infrastructure that provides LNVA water to Bolivar SUD also provides water to county-other in the Neches-Trinity basin.

County-Other in Montgomery County

COH provides 381 acre-feet per year to Montgomery County MUD 98. The entirety of this amount was allocated to county-other.

County-Other in Polk County

The 20 acre-feet per year TRA supply allocated is the sum of contracts to Memorial Point Townhouse Association and Fountain Lake Townhouse Association.

County-Other in San Jacinto County

Waterwood MUD has a contract for 560 acre-feet per year from the Trinity River Authority. This supply was allocated to county-other in the Trinity River Basin.

County-Other in Trinity County

Three contracts from TRA were entered as county-other category in Trinity County. One of the contracts for 1,000 acre-feet per year, listed for "Individual Domestic Use" was entirely allocated to county-other in Trinity County. Westwood Shores MUD is the recipient of 108 acre-feet per year from TRA, and it represents part of the demand of the county-other category in Trinity County. Westwood Shores POA receives 10 acre-feet per year from the TRA. The other contract entered in this category is part of the Trinity County Regional Water Supply System (TCRWSS) contract. TCRWSS has a contract with TRA for 3,360 acre-feet per year. TCRWSS provides water, on a retail basis, to the WUGs of Trinity, Groveton (located in Region H and I), and Riverside Water Supply. It was assumed that enough water would be provided to each WUG TCRWSS serves to meet demands and that the remaining contract would be allocated to county-other in Trinity County.

County-Other in Walker County

Most of the contract of 22,403 acre-feet per year that the Huntsville Regional Water Supply System (HRWSS) has with TRA was allocated to the City of Huntsville. A small portion of this contract (15 percent) was allocated to county-other, based on the assumption that there are unincorporated areas in the vicinity of Huntsville that are supplied by the city. This amount was split by basin based on the water demand ratios.

Crosby

Crosby MUD serves the City of Crosby and has a contract with SJRA for 1,120 acre-feet per year. Based on the information received from the City of Crosby, all the water is used for residential purposes except a small amount that is supplied to a manufacturing company located in Harris County. The City of Crosby receives 1,050 acre-feet per year. The remaining 70 acre-feet is allocated to the manufacturing category in Harris County, San Jacinto River Basin.

Deer Park

The City of Deer Park has a contract with COH for 3,956 acre-feet per year, and Deer Park uses the entire amount for residential purposes. The contract was split by basins based on the surface water demand ratios.

Dickinson

Galveston County WCID 1 has a contract with GCWA for 5,224 acre-feet per year and provides this water to Dickinson, Texas City, and League City, which are all retail customers. The contract amount, after adjustment, is equal to 3,232 acre-feet per year. Based on the information received from Galveston County WCID 1, it provides water to 50 houses in Texas City, League City pays for 1 mgd (it currently uses 150,000 gallons/day), and the rest goes to Dickinson. For all decades, Texas City was allocated an amount equal to 2.5 persons/house and a 150 gallons per day per person. League City was allocated the 1 mgd contract.

El Lago

The City of Seabrook receives water from the City of Pasadena and then sells the water to El Lago. The volume of water provided by Pasadena was split between Seabrook and El Lago based on surface water demands. The contract with the City of Pasadena is for 1,120 acre-feet per year.

Freeport

BWA has a contract with Freeport for 2,240 acre-feet per year. Based on the information received from the City of Freeport, 85 percent of this contract is allocated to the City of Freeport, and the remaining 15 percent is allocated to different manufacturers in the San Jacinto-Brazos and Brazos River Basins.

Friendswood

Friendswood has a contract with COH for 6,719 acre-feet per year and is one of the Southeast Purification Plant participants. The contract is entirely allocated to municipal use for the City of Friendswood. The contract was split in two entries in different counties, based on the surface water demand ratios for the two counties.

Galena Park

Galena Park has a contract with COH for 1,008 acre-feet per year. Galena Park personnel indicated that 94.6 percent of this contract goes to municipal use for the City of Galena Park. The remaining 5.4 percent of the contract amount is supplied to manufacturing use in Harris County in the San Jacinto River Basin. Galena Park receives 954 acre-feet per year. Manufacturing in the San Jacinto River Basin receives the balance of the contract, or 54 acre-feet per year.

Galveston

Galveston receives 24,217 acre-feet per year from GCWA. This water is distributed among the city and two wholesale customers, Galveston County MUD 1 and Jamaica Beach. Galveston no longer serves customers that are not located on Galveston Island. As these customers receive water on a retail basis, it is difficult to determine a set amount provided to each one. Instead, this volume of water was divided among the three recipients according to their surface water demands in each decade.

Galveston County MUD 1

The Galveston County MUD 1 surface supply is divided out of the total supply from GCWA to the City of Galveston according to its demand ratio among the other two recipients as described under Galveston.

Galveston County WCID 12

The division of the GCWA supply to Galveston County WCID 12 and the WUGs it provides water to, is described under Clear Lake Shores.

Groveton

Groveton receives 119 acre-feet per year from TCRWSS in 2010, as explained in the county-other in Trinity County section above. This allocation represents the amount supplied to the portion of Groveton located within Region H.

Harris County FWSD 6

Harris County FWSD is provided 187 acre-feet of water per year from NCWA as described under county-other in Harris County.

Harris County FWSD 47

Harris County FWSD 47 receives 288 acre-feet per year of water from NCWA. This amount was allocated as described under county-other for Harris County.

Harris County FWSD 51

Harris County FWSD 51 is also a customer of NCWA and is provided a portion of water according to the description under county-other in Harris County. The estimated supply to FWSD 51 is 1,539 acre-feet per year.

Harris County MUD 8

COH has a contract with Harris County MUD 8 to provide 420 acre-feet of groundwater.

Harris County MUD 53

NCWA provides an estimated 836 acre-feet per year of supply to Harris County MUD 53. This estimate is described for county-other in Harris County.

Harris County MUD 55

The COH provides 3,877 acre-feet per year to Harris County MUD 55. This contract is perpetual and was assumed to continue throughout the planning periods.

Harris County MUD 158

Harris County MUD 158 receives 411 acre-feet of groundwater per year from COH. It was assumed that this water originated from the San Jacinto River Basin.

Harris County MUD 261

Harris County MUD 261 and Windfern Forest UD receive 140 acre-feet of groundwater/year from COH. This amount was split between the two districts according to surface water demands.

Harris County WCID 1

BAWA has a contract to provide 784 acre-feet per year to Harris County WCID 1.

Harris County WCID 21

NCWA provides 913 acre-feet of water per year to Harris County WCID 21 as described under county-other in Harris County.

Harris County WCID 36

The description for county-other in Harris County explains the allocation of water from NCWA and includes the 802 acre-feet per year provided to Harris County WCID 36.

Harris County WCID 84

Harris County WCID 84 provides 310 acre-feet of water per year to Channelview from its source, NCWA. The assignment of this supply is described under county-other in Harris County.

Hedwig Village

Memorial Villages Water Authority (MVWA) has a contract with COH for 747 acre-feet per year of blended water. It was assumed for planning purposes that this water originated from a surface source. Based on the information received from MVWA, this contract is split between Hedwig Village, Piney Point Village, and Hunters Creek. Since these entities are retail customers, without information on exact amounts, the contract was split among the customers based on their total water demand ratios for each planning period.

Hitchcock

Hitchcock is a customer of GCWA and is contracted to receive 1,731 acre-feet per year on a perpetual basis.

Houston

The City of Houston, in its capacity as water provider to residents within the city limits, receives its water from several sources that are operated as a system. The available supply of this system, less contracts to other parties, was assumed to make up the available supply for Houston. This total volume was distributed among the individual occurrences of the Houston WUG in each basin and county.

Additionally, the Clear Lake City Water Authority provides a portion of its contract from COH to areas of Houston. As some of the authority's contracts are indefinable, it was assumed that Webster and Pasadena received a share of water prorated by the area served in each community. The amount of water remaining was assumed to serve Clear Lake (a portion of the Houston WUG). The amounts of water provided to each CLCWA customer are shown below.

- City of Houston 8,076 ac-ft/yr
- City of Pasadena 8,619 ac-ft/yr

- Taylor Lake Village 1,730 ac-ft/yr
- Nassau Bay 2,184 ac-ft/yr
- Manufacturing 1,792 ac-ft/yr

Humble

The City of Houston provides 47 acre-feet of groundwater per year to Humble.

Hunters Creek Village

This entity receives its water from the MVWA. As described under Hedwig Village, the amount of water that MVWA receives from COH was shared among its customers based on the surface water demand ratios.

Huntsville

Huntsville receives 22,403 acre-feet of groundwater per year from the Huntsville Regional Water Supply System (HRWSS). Approximately 15 percent of this water is allocated to county-other to support surrounding communities. The remaining supply was allocated to the City of Huntsville.

Jacinto City

Jacinto City has a contract with COH for 1,120 acre-feet per year, and the entire amount of the contract is allocated to municipal use in Jacinto City.

Jamaica Beach

The City of Galveston provides water to Jamaica Beach, as described under Galveston. The portion of water provided to Jamaica Beach for each planning period was prorated from the GCWA supply according to the surface water demands of each end user customer.

Jersey Village

The City of Jersey village has a contract with COH for 840 acre-ft per year of groundwater.

Kemah

Galveston County WCID 12 provides water to Kemah, as described for Clear Lake Shores.

La Marque

The GCWA contract to La Marque was reduced from 3,207 to 2,224 acre-feet per year. The contract is entirely allocated for municipal usage.

La Porte

The La Porte Area Water Authority receives water from COH and then distributes water to the City of La Porte and other customers. The City of La Porte receives 8,656 acre-feet per year, as described previously at county-other in Harris County. This contract was split between the city's WUGs in the San Jacinto and San Jacinto-Brazos River Basins.

Lake Livingston Water Supply & Sewer Service Company

The Lake Livingston Water Supply & Sewer Service Company has a contract for 954 acre-feet per year from the TRA. The supply was split according to demand.

Lake Jackson

Lake Jackson receives water from BWA, and the entire contract of 2,240 acre-feet per year is allocated to municipal use for Lake Jackson.

League City

League City receives the majority of its water from two providers, GCWA and Galveston County WCID 1. The League City contract with GCWA is for 2,307 acre-feet per year. League City also contracts for 1 mgd with Galveston County WCID 1. Galveston County WCID 12 also provides a small amount of water to customers in a portion of League City in Harris County. This is shown under Clear Lake Shores.

Livingston

Livingston receives water from the Livingston Regional Water Supply System. The entire amount, 5,601 acre-feet per year, is allocated to Livingston for its municipal use.

Missouri City

Missouri City has a contract with GCWA for 16,802 acre-feet per year. However, this amount was reduced to 9,487 to reflect the supply available from the GCWA. The other provider for Missouri City is Fort Bend WCID 2. The amount received by Missouri City from Fort Bend County WCID 2 is shown above, at county-other in Fort Bend County. Missouri City in Fort Bend County is split by basins based upon surface water demand ratios.

Nassau Bay

Nassau Bay receives water from Clear Lake City Water Authority (CLCWA). The current amount contracted, 2,184 acre-feet per year, is assumed to remain constant through 2060. Nassau Bay uses the whole amount contracted for its municipal use.

North Fort Bend Water Authority (NFBWA)

The COH has a contract with the North Fort Bend Water Authority which supplies 21,841 acre-feet per year of water. The COH will activate the supply to the (NFBWA) in the year 2013.

North Harris County Regional Water Authority

NHCRWA has a contract with COH for 11 acre-feet per year until 2010. Beginning in 2010, the authority will receive 34,714 acre-feet of surface water/year.

Oyster Creek

Oyster Creek receives water from BWA, and the entire contract, 106 acre-feet per year, is allocated for municipal use in Oyster Creek.

Pasadena

Pasadena receives water from COH and from CLCWA. The COH contract allocation is described under county-other in Harris County. The CLCWA contribution to Pasadena was described above under Houston.

Pearland

Pearland has a contract with GCWA with an available supply of 15,675 acre-feet per year, valid until 2010, and a contract with COH for 560 acre-feet per year until 2041. Pearland is located in Harris and Brazoria Counties. Therefore, these contracts are split between the two counties based on surface water demand.

Pecan Grove

Pecan Grove receives 3,101 acre-ft of water contracted from the BRA via the GCWA. Although Pecan Grove has already contracted supply from the BRA, construction of a surface water treatment plant to treat the raw water will not begin construction until 2010. Pecan Grove is located in Fort Bend County and the contract is allocated for 3,101 acre feet per year for municipal use.

Pine Trails Utility

Pine Trails Utility is a customer of NCWA and receives 480 acre-feet per year as estimated under county-other in Harris County.

Piney Point Village

Memorial Villages Water Authority (MVWA) provides Piney Point Village with water from its contract with COH. As described above, under Hedwig Village and Hunters Creek Village, this contract is split between the MVWA customers.

Richmond

The City of Richmond has two municipal contracts with the Brazos River Authority for a total amount of 3,000 acre-feet per year.

Richwood

Richwood receives water from BWA, and the entire contract of 263 acre-feet per year is allocated for municipal use by Richwood.

Riverside WS Corp

Riverside WS Corp receives 20 acre-feet of water/year from TCRWS as mentioned above in county-other for Trinity County. This amount was allocated to Walker County as San Jacinto County had no shortages for this WUG.

Rosenberg

Rosenberg receives water from the Brazos River Authority and the contract of 4,500 acre-feet per year is allocated for municipal use by Rosenberg.

San Jacinto WSC

San Jacinto Water Supply Corporation receives 280 acre-feet per year from TRA. Coldspring is included in their service area, but since Coldspring has enough groundwater to meet its demand, this contract was allocated entirely to the San Jacinto Water Supply Company.

San Leon

San Leon receives 2,059 acre-feet per year of water from GCWA. The entire contract amount is allocated to the municipal use in San Leon.

Santa Fe

Santa Fe (Galveston County WCID 8) has a contract with GCWA for 1,154 acre-feet per year.

Seabrook

The Pasadena contract was split between El Lago and Seabrook as described under El Lago.

Shoreacres

La Porte provides water to Shoreacres, as shown in the allocation of the contract between the La Porte Area Water Authority and COH described under county-other in Harris County.

South Houston

As one of the Southeast Water Purification Plant partners, South Houston has a contract with COH for 4199 acre-feet per year. The contract is entirely allocated to municipal use for the City of South Houston.

Southside Place

Southside Place has a contract with COH for 319 acre-feet per year, and the entire contract is used to meet its municipal demands.

Stafford

Stafford receives water from Fort Bend County WCID 2. Fort Bend County WCID 2 has an option contract with GCWA. The contract allocation is described above at county-other in Fort Bend County. The amount that Stafford receives is split between Fort Bend County and Harris County based on surface water demand ratios. The amount allocated to the part of Stafford located in Fort Bend County is split by basins, between San Jacinto and San Jacinto-Brazos River Basins, based on their surface water demand ratios.

Sugar Land

Sugar Land has two water providers. Fort Bend County WCID 2 provides water to some residents of Sugar Land, and the amount allocated is described under county-other in Fort Bend County. This amount is assumed to serve the portion of Sugar Land located in the San Jacinto-Brazos River Basin. GCWA has a contract with the City of Sugar Land for 22,403 acre-feet per year. This contract was adjusted to 12,533 acre-feet per year and is entirely allocated to the City of Sugar Land for its municipal use. The GCWA contract amount was split by basins based on the surface water demand ratios.

Sunbelt FWSD

The City of Houston provides 187 acre-feet of groundwater per year to the Sunbelt FWSD, in addition to 299 acre-feet of blended water/year. This blended supply is assumed to be surface water in *Appendix 3H*. Sunbelt is also a member of the COH Groundwater Reduction Plan.

Taylor Lake Village

Clear Lake City Water Authority provides 1,730 acre-feet of water per year to Taylor Lake Village. The allocation of the CLCWA contract with COH was described under Houston.

Texas City

Texas City has two water providers. The entity providing the largest amount is GCWA. The contract from GCWA is 12,016 acre-feet per year and is used entirely by the City of Texas City for its municipal water usage. The other provider is Galveston County WCID 1, and the allocation of its contract with GCWA is summarized under Dickinson. This small amount of water was estimated to be approximately 21 acre-feet per year.

The Woodlands

The Woodlands receives 11,303 acre-feet per year of groundwater from SJRA. The available groundwater supply is projected to be diminished over time as a result of groundwater availability and projected surface water conversion.

Tiki Island

Tiki Island receives water from GCWA under a contract for 415 acre-feet per year.

Trinity

Trinity receives water from TCRWSS. The allocation of the TCRWSS contract is described under county-other in Trinity County and is equal to the TWDB demands for Trinity.

Trinity Bay Conservation District

The Trinity Bay Conservation District receives 663 acre-feet per year from CLCND. LNVA provides an additional sum of water on an as-needed basis to the district through the Winnie Treatment Plant. When the new Winnie Water Treatment Plant is completed, the district will have the capacity to receive 2.4 mgd of water from LNVA. Therefore, it is assumed that the available supply from the Rayburn-Steinhagen system is 2,688 acre-feet per year. These supplies were split between the Trinity and Neches-Trinity River Basins according to demand.

Trinity Rural WS Corp

The Trinity Rural WSC supply is provided 1,240 acre-feet per year by TRA. The supply was split between the Polk, Trinity and Walker Counties based on demand.

Webster

The City of Webster has a contract with COH for 4,536 acre-feet per year and is using the entire contract amount for its municipal water use. CLCWA provides an additional 4,475 acre-feet per year from their surface water allocation from COH.

West Harris County Regional Water Authority

WHCRWA will begin a contract with COH for 20,437 acre-feet per year in 2010. This amount was allocated between the portions of WHCRWA located in Harris and Fort Bend Counties based on surface water demand.

West University Place

The City of West University Place has a contract with COH for 2,053 acre-feet of groundwater/year, and it is using the entire contract amount for its municipal water use.

Windfern Forest UD

Windfern Forest UD shares a 140 acre-feet per year contract with Harris County MUD 261. This amount was split between the two districts according to their demands in each decade as described under Harris County MUD 261.

3.4.4.2 Manufacturing Supplies

BRAZORIA COUNTY

Brazoria County manufacturing supplies are allocated below.

Provider	2010	2020	2030	2040	2050	2060
	(acre-feet/year)					
Angleton	202	202	202	202	202	202
Dow	137,475	137,475	137,475	137,475	137,475	137,475
Freeport	336	336	336	336	336	336
GCWA	45,010	45,010	45,010	45,010	45,010	45,010
BRA	16,000	16,000	16,000	16,000	16,000	16,000
Individual Water Rights	11,354	11,422	11,422	11,422	11,422	11,422

The supply listed by the City of Angleton is provided from their contract from BWA. The Dow supply represents the company’s firm water right and assumes that the full quantity is either contracted to other entities or used for the Dow facility itself. The 16,000 acre-feet listed from BRA is contracted to Dow. Freeport allocates approximately 15 percent of its contract from BWA to manufacturing, providing the value listed above. The sum of GCWA contracts to manufacturers in the San Jacinto-Brazos River Basin totals 45,010 acre-feet per year (after adjustment in order to observe available supplies). All contract amounts were allocated to the basin in which the consumer was located. Water rights intended for manufacturing were allocated to the basin the source originated in. Individual water rights in the Brazos-Colorado basin total 12,019 acre-feet per year and are available to Region H and Region K. A portion of these water rights are allocated to steam electric demands in Region K. The remainder is allocated to Manufacturing in Brazoria County, shown in the table above.

FORT BEND COUNTY

Fort Bend County manufacturing supplies are allocated below.

Provider	2010 ac-ft/yr	2020 ac-ft/yr	2030 ac-ft/yr	2040 ac-ft/yr	2050 ac-ft/yr	2060 ac-ft/yr
BRA	400	400	400	400	400	400
FBC WCID 1	1,000	1,000	1,000	1,000	1,000	1,000

The Fort Bend County WCID 1 has a contract with Imperial Sugar for 1,000 acre-feet per year. Originally, this contract was for the entire 20,000 acre-feet per year yield from this right. However, this was reduced due to Imperial Sugar's plant closure. This contract was allocated to the San Jacinto-Brazos River Basin. The 400 acre-feet per year shown from BRA is contracted to Vulcan Materials.

GALVESTON COUNTY

Galveston County manufacturing supplies are allocated below.

Provider	2010 ac-ft/yr	2020 ac-ft/yr	2030 ac-ft/yr	2040 ac-ft/yr	2050 ac-ft/yr	2060 ac-ft/yr
GCWA	68,414	68,414	68,414	68,414	68,414	68,414

The GCWA amount represents the sum of contracts between the Gulf Coast Water Authority and manufacturers in Galveston County, San Jacinto-Brazos River Basin. This sum is adjusted so that the total GCWA contracts do not exceed supplies.

HARRIS COUNTY

Harris County manufacturing supplies are allocated below.

Provider	2010 ac-ft/yr	2020 ac-ft/yr	2030 ac-ft/yr	2040 ac-ft/yr	2050 ac-ft/yr	2060 ac-ft/yr
COH	379,312	379,312	379,312	379,312	379,312	379,312
Crosby	70	70	70	70	70	70
CLCWA	1,792	1,792	1,792	1,792	1,792	1,792
Galena Park	54	54	54	54	54	54
NCWA	1,046	1,046	1,046	1,046	1,046	1,046
Pasadena	5,040	5,040	5,040	5,040	5,040	5,040
SJRA	75,703	75,703	75,703	75,703	75,703	75,703

The COH amount includes Houston contracts to manufacturers in Harris County. The appropriate portions of the contract sum were allocated to the basin in which the manufacturer was located. The supplies from Crosby and Galena Park represent portions of their contracted supplies provided for manufacturing. The Pasadena supply was split between the San Jacinto and San Jacinto-Brazos River Basins according to surface water demand. The sum of SJRA contracts was split according to the location of the contract customer.

A portion of the water provided by COH, equal to 23,404 acre-feet per year, is actually contracted to Lyondell-Citgo Refining. This water is used for refinery processes by LCR as well as 16,733 acre-feet/year of steam-electric demand by a customer of LCR. Attempts were made to contact LCR regarding how this water is used, which user receives the water first, and which portion of the water is reused between the two users. Lyondell-Citgo was unable to provide any information regarding this use pattern and, therefore, the total sum of water has been shown in the shortage analysis and the table above with COH as the provider.

3.4.4.3 Irrigation Supplies

BRAZORIA COUNTY

Brazoria County irrigation allocations are tabulated below.

Irrigator	2010 ac-ft/yr	2020 ac-ft/yr	2030 ac-ft/yr	2040 ac-ft/yr	2050 ac-ft/yr	2060 ac-ft/yr
GCWA	13,694	13,694	13,694	13,694	13,694	13,694
Individual Water Rights	10,529	10,529	10,529	10,529	10,529	10,529

The water supply listed as individual water rights consists of the firm water rights within each basin. It was assumed that this water was used for agriculture within the source basin.

CHAMBERS COUNTY

Chambers County irrigation allocations are tabulated below.

Irrigator	2010 ac-ft/yr	2020 ac-ft/yr	2030 ac-ft/yr	2040 ac-ft/yr	2050 ac-ft/yr	2060 ac-ft/yr
CLCND	40,000	40,000	40,000	40,000	40,000	40,000
LNVA	38,000	38,000	38,000	38,000	38,000	38,000
TRA	16,818	16,552	16,370	16,170	15,941	15,669
Individual Water Rights	23,995	23,995	23,995	23,995	23,995	23,995

The CLCND amount represents the volume of water provided to Devers Canal customers in the Neches-Trinity River Basin by the CLCND. The LNVA amount is the sum of annual irrigation contracts to individuals in the Neches-Trinity River Basin. The water supplied by TRA represents the amount contributed to the Devers Canal system, split between Chambers and Liberty Counties according to irrigation surface demand in the basins served by the canal. In Chambers County, this water was only provided to the Neches-Trinity River Basin. Individual water rights for irrigation were assumed to be applied within the basin from which they originated.

FORT BEND COUNTY

Fort Bend County irrigation allocations are tabulated below.

Irrigator	2010 ac-ft/yr	2020 ac-ft/yr	2030 ac-ft/yr	2040 ac-ft/yr	2050 ac-ft/yr	2060 ac-ft/yr
GCWA	2,143	2,143	2,143	2,143	2,143	2,143
NRG	12,000	12,000	12,000	12,000	12,000	12,000

The GCWA supply represents the adjusted contract amounts between GCWA and several irrigators in the San Jacinto-Brazos River Basin. The supply from NRG represents the firm irrigation supply from the Brazos River Basin contracted to Richmond Irrigation. It was assumed that this entire amount was used within the Brazos River Basin. The balance of this water right was allocated to steam-electric in the Brazos basin.

GALVESTON COUNTY

Galveston County irrigation allocations are tabulated below.

Irrigator	2010 ac-ft/yr	2020 ac-ft/yr	2030 ac-ft/yr	2040 ac-ft/yr	2050 ac-ft/yr	2060 ac-ft/yr
GCWA	142	142	142	142	142	142

The GCWA allocated amounts equal the contracted volume of water to irrigation users in Galveston County.

HARRIS COUNTY

Harris County irrigation allocations are tabulated below.

Irrigator	2010 ac-ft/yr	2020 ac-ft/yr	2030 ac-ft/yr	2040 ac-ft/yr	2050 ac-ft/yr	2060 ac-ft/yr
SJRA	1,476	1,476	1,476	1,476	1,476	1,476
Individual Water Rights	1,355	1,355	1,355	1,355	1,355	1,355

The SJRA amount is equal to the current irrigation contracts between SJRA and customers in Harris County. It was assumed that these annual contracts ran perpetually and that they served irrigation demands in the San Jacinto River Basin.

LIBERTY COUNTY

Liberty County irrigation allocations are tabulated below.

Irrigator	2010 ac-ft/yr	2020 ac-ft/yr	2030 ac-ft/yr	2040 ac-ft/yr	2050 ac-ft/yr	2060 ac-ft/yr
COH	33,000	33,000	33,000	33,000	33,000	33,000
Devers Canal	2,500	2,500	2,500	2,500	2,500	2,500
LNVA	17,200	17,200	17,200	17,200	17,200	17,200
TRA	10,682	10,948	11,130	11,130	11,559	11,831

The COH supply was purchased from the Dayton Canal Irrigation Company and is assumed to be provided to irrigators within the Trinity River Basin. The Devers Canal irrigation supply listed above is from a water right from the Trinity River and was split between the basins served by the Devers Canal system based on demand. This supply has recently been purchased by the Lower Neches Valley Authority (LNVA). The LNVA amount is the sum of the authority's contracts to individual farmers, assumed to be located in the Neches-Trinity River Basin. The volume of water provided to irrigation by TRA is Liberty County's share of the TRA contribution to the Devers Canal system. The water rights available to irrigation in Liberty County were allocated to the basin in which the supply originated.

MONTGOMERY COUNTY

Montgomery County irrigation allocation is tabulated below.

Irrigator	2010 ac-ft/yr	2020 ac-ft/yr	2030 ac-ft/yr	2040 ac-ft/yr	2050 ac-ft/yr	2060 ac-ft/yr
SJRA	880	880	880	880	880	880

The SJRA amount is the sum of water contracts between SJRA and irrigators in Montgomery County. These year to year contracts were assumed to be renewed through 2060.

SAN JACINTO COUNTY

San Jacinto County irrigation allocation is tabulated below.

Irrigator	2010 ac-ft/yr	2020 ac-ft/yr	2030 ac-ft/yr	2040 ac-ft/yr	2050 ac-ft/yr	2060 ac-ft/yr
TRA	135	135	135	135	135	135

The TRA amount allocated is the sum of two contracts between Royal Pines and Waterwood National Resort and TRA.

TRINITY COUNTY

Trinity County irrigation allocation is tabulated below.

Irrigator	2010 ac-ft/yr	2020 ac-ft/yr	2030 ac-ft/yr	2040 ac-ft/yr	2050 ac-ft/yr	2060 ac-ft/yr
TRA	290	290	290	290	290	290

The TRA amount allocated is a lump sum of contracts between several water recipients and TRA. The sum of these contracts, 290 acre-feet per year, is the sum of all the individual irrigation amount contracts in Trinity County.

3.4.4.4 Mining Supplies

FORT BEND COUNTY

Fort Bend County mining supplies are allocated below:

Provider	2010 ac-ft/yr	2020 ac-ft/yr	2030 ac-ft/yr	2040 ac-ft/yr	2050 ac-ft/yr	2060 ac-ft/yr
GCWA	583	583	583	583	583	583

The GCWA contract provides water to Texas Brine in the San Jacinto-Brazos River Basin.

3.4.4.5 Steam-Electric Supplies

CHAMBERS COUNTY

Chambers County steam-electric supplies are allocated below:

Provider	2010 ac-ft/yr	2020 ac-ft/yr	2030 ac-ft/yr	2040 ac-ft/yr	2050 ac-ft/yr	2060 ac-ft/yr
NRG	30,000	30,000	30,000	30,000	30,000	30,000

The portion shown above is provided through Water Right 3460903926 from Cedar Bayou owned by NRG.

FORT BEND COUNTY

Fort Bend County steam-electric supplies are allocated below:

Provider	2010 ac-ft/yr	2020 ac-ft/yr	2030 ac-ft/yr	2040 ac-ft/yr	2050 ac-ft/yr	2060 ac-ft/yr
NRG	111,711	111,711	111,711	111,711	111,711	111,711

The sum of supplies represents two individual rights owned by NRG for use in the Brazos River Basin (Water Rights 3461205320 and 3461205325 (28,711 acre-feet per year)) and a contract from BRA for 83,000 acre-feet per.

GALVESTON COUNTY

Galveston County steam-electric supplies are allocated below:

Provider	2010 ac-ft/yr	2020 ac-ft/yr	2030 ac-ft/yr	2040 ac-ft/yr	2050 ac-ft/yr	2060 ac-ft/yr
GCWA	2,231	2,231	2,231	2,231	2,231	2,231

The GCWA portion represents the sum of two contracts to steam-electric WUGs in the San Jacinto-Brazos River Basin. These contracts have been adjusted according to the procedures outlined above to limit GCWA contracts to available supplies.

HARRIS COUNTY

Harris County steam-electric supplies are allocated below:

Provider	2010 ac-ft/yr	2020 ac-ft/yr	2030 ac-ft/yr	2040 ac-ft/yr	2050 ac-ft/yr	2060 ac-ft/yr
COH	14,369	14,369	14,369	14,369	14,369	14,369

The COH supply is provided to two steam-electric WUGS in the San Jacinto River Basin. Water Right 3461105350 (2120 acre-feet per year) from Clear Creek was cancelled by NRG and is not assumed to be available for use in power generation.

MONTGOMERY COUNTY

Montgomery County steam-electric supplies are allocated below:

Provider	2010 ac-ft/yr	2020 ac-ft/yr	2030 ac-ft/yr	2040 ac-ft/yr	2050 ac-ft/yr	2060 ac-ft/yr
SJRA	7,841	7,841	7,841	7,841	7,841	7,841

The SJRA supply from Lake Conroe provides water to Entergy for steam-electric use.

3.4.5 Wholesale Water Providers

The resources available to Water User Groups (WUGs) in Region H through Wholesale Water Providers (WWPs) are listed in *Appendix 3I*. The Appendix lists the WWPs that supply water directly to WUGs and lists if the water is “self supplied” or contracted from another WWP. In instances where supplies are contracted from another WWP, the supplier is listed in the “Source WWP” column. This list was compiled with the use of the TCEQ Water Rights Database, WAM and GAM results, contract information and clarifications received directly from the WWPs, and the allocation of groundwater resources shown above.

For the sake of this study, water supplies that are contracted by customers from the City of Houston and delivered via the CWA system have been included with the data for COH. Similarly, TRA is listed as the wholesale water provider for supplies provided by the Trinity County Regional Water Supply System, Huntsville Regional Water Supply System, and Livingston Regional Water Supply System as these providers are operated by TRA.

The groundwater supplies shown in *Table 3-14* represent the groundwater supplied to a WUG by the WWP and not groundwater used by a WUG from its own wells. These amounts of groundwater are generally the available supply as determined by the groundwater allocation method described above. However, COH was known to provide specified amounts of groundwater to its contract customers. Therefore, for the COH WWP, the available supply of groundwater is equal to the groundwater supplied to the Houston WUG plus the sum of groundwater contracts to customers. The groundwater available to NCWA is equal to the sum of groundwater allocated to its customers as it was assumed that NCWA is the only source of water for these customers. Fort Bend County WCID #2 was assumed to provide groundwater to the city of Meadows. Galveston County WCID 1 was allocated the groundwater associated with Dickinson as part of its available supply. The Woodlands is provided water by SJRA, and the groundwater that was available to The Woodlands was assumed to originate from SJRA. Finally, CHCRWA, NFBWA, NHCRWA, the City of Galveston, City of Pasadena, WHCRWA, Sugarland, Missouri City, Richmond-Rosenberg and the City of Huntsville were allocated the groundwater associated with each of the WUGs by the same name.

The volume of WWP supplies available to individual WUGs was determined through contract information from the WWPs, previous records, and further clarification from both the providers and customers. Where it was not possible to determine specific contract amounts to each WUG, other methods were used to approximate the supply to each WUG as described above in the groundwater and surface water allocation sections.

The 2060 supplies available to each WWP are shown below in *Table 3-14*. Wholesale Water Providers that receive water from another WWP through contractual transfer are listed below the original provider.

The surface water supplies are summarized by county, basin and category of use in *Table 3-15*. Similarly, *Tables 3-16* and *Table 3-17* summarize the groundwater and reuse supplies, respectively. An updated shortage analysis will be included in *Chapter 4* based on projected demands described in *Chapter 2*. During the development of the 2011 Region H Water Plan it was noted that several counties in Region H had experienced significant population growth indicating that current and future demands may be higher than previously projected. As a result, shortages in later decades may become greater than projected. If that occurs additional shortages may be met with alternative strategies described later in *Chapter 4*. The current surface water supplies are summarized by category of water use by basin by WWP in *Appendix 3J*.

Table 3-14

Summary of Supplies Available to Region H Wholesale Water Providers in 2060

Wholesale Water Provider*	Available Supplies (acre-feet)		
	Contracts**	Groundwater	Surface Water Rights
Brazos River Authority ¹			155,031
Dow Chemical Company	16,000		137,475
Gulf Coast Water Authority ²	44,980		214,260
City of Galveston	25,406	1,539	
Fort Bend County WCID #2	6,579	796	
Galveston County WCID 1 ³	3,232	309	
Missouri City	9,645	9,340	
NRG ⁴	83,000		94,220
Sugarland	12,563	9,027	
Richmond-Rosenburg	7,500	4,279	
Brazosport Water Authority			16,492
Chambers-Liberty Counties Navigation District ⁵			76,520
Fort Bend County WCID 1			5,634
City of Houston ⁶		83,818	1,254,628
Baytown Area Water Authority	17,534		
Central Harris County Regional Water Authority ⁷	2,375	1,287	
Clear Lake City Water Authority ⁸	26,876		
La Porte Area Water Authority	9,750		
North Channel Water Authority ⁹	6,682	1,645	
North Fort Bend Water Authority ¹⁰	21,434	26,643	
North Harris County Regional Water Authority ¹¹	34,714	30,558	
City of Pasadena ¹²	38,514	2,047	
West Harris County Regional Water Authority ¹³	20,437	16,521	
Lower Neches Valley Authority ¹⁴			64,177
San Jacinto River Authority ¹⁵		7,359	232,744
Trinity River Authority			403,200
City of Huntsville	22,403	5,164	

*WWPs that provide water through contract to other WWPs are shown with the customer WWPs listed below the sellers.

**Water received under contract from another WWP.

- ¹ Available supplies represent contractual agreements to Region H customers only. Supply quantities are for the amount of water currently contracted to Region H customers by BRA.
- ² GCWA contracts with its customers exceed available firm yield supplies. For the purpose of the shortage analysis, contracts were adjusted not to exceed supplies.
- ³ Supplies include GCWA contract and maximum amount of groundwater allowed for Dickinson per HGSD regulations.
- ⁴ Supplies include contractual demands to Richmond Irrigation and Brazos Valley Energy, as well as the entire portion of the GCWA contract, which is assumed to be used by NRG. Actual demands may be greater but are overall split among supply sources since actual data is unavailable.
- ⁵ CLCND supply includes rights from Lake Anahuac, less 30,000 acre-feet sold to SJRA.
- ⁶ Groundwater supply includes the portion of groundwater provided to Houston after prorating available, restricted supplies to WUGs, plus groundwater contracted to other WWPs. Demands include contracts to BAWA, CLCWA, LPAWA, Lyondell-Citgo, NCWA, NHCRWA, Pasadena, and WHCRWA WWPs. Surface water rights for COH include 33,000 acre-feet purchased from the Dayton Canal Irrigation Company; it is allocated entirely to irrigation demands in Liberty County.
- ⁷ Available Groundwater Supplies are supplied by the CHCRWA, not contracted from the City of Houston.
- ⁸ Assumes all water remaining after contracts is provided to Clear Lake (Houston WUG).
- ⁹ NCWA groundwater supply estimated from the 2003-2004 ratio of groundwater to contract water. Demands were assumed to equal supplies.
- ¹⁰ Available Groundwater Supplies are supplied by the NFBWA, not contracted from the City of Houston.
- ¹¹ Available Groundwater Supplies are supplied by the NHCRWA, not contracted from the City of Houston.
- ¹² Includes total Pasadena demands, less the portion met by CLCWA.
- ¹³ Available Groundwater Supplies are supplied by the WHCRWA, not contracted from the City of Houston.
- ¹⁴ Supplies represent contractual agreements to Region H customers only. Supply quantities are for the entire Rayburn-Steinhagen system and do not represent the portion available to Region H.
- ¹⁵ Includes water demands and available groundwater supplied to The Woodlands. The 2060 groundwater supply shown above is the least amount of groundwater available throughout the planning periods. Also includes 14,944 acre-feet of permitted indirect reuse.

Table 3-15
Surface Water Supply by Categories of Water Use in Each County and Basin

County	Basin	Use	Available Supplies (acre-feet per year)					
			Year 2010	Year 2020	Year 2030	Year 2040	Year 2050	Year 2060
AUSTIN	COLORADO	LIVESTOCK	52	56	58	59	60	61
BRAZORIA	BRAZOS	IRRIGATION	1,850	1,850	1,850	1,850	1,850	1,850
		LIVESTOCK	220	228	232	235	236	238
		MANUFACTURING	153,763	153,763	153,763	153,762	153,742	153,762
		MINING	190	190	190	190	190	190
		MUNICIPAL	223	199	183	172	162	154
	BRAZOS-COLORADO	LIVESTOCK	200	202	206	210	217	225
		MANUFACTURING	11,354	11,422	11,422	11,422	11,422	11,422
		MINING	1,124	1,124	1,124	1,124	1,124	1,124
		MUNICIPAL	478	478	478	478	478	478
	SAN JACINTO-BRAZOS	IRRIGATION	25,131	25,131	25,131	25,131	25,131	25,131
		LIVESTOCK	545	505	547	591	643	690
		MANUFACTURING	45,260	45,260	45,260	45,261	45,281	45,261
MINING		305	305	305	305	305	305	
MUNICIPAL		23,155	23,223	23,259	23,280	23,302	23,320	
CHAMBERS	NECHES-TRINITY	IRRIGATION	116,568	116,302	116,120	115,920	115,691	115,419
		LIVESTOCK	317	317	317	317	317	318
		MINING	505	505	505	505	505	505
		MUNICIPAL	3,806	3,863	3,931	4,007	4,092	4,191
	TRINITY	LIVESTOCK	50	50	50	50	51	51
		MINING	18,989	18,989	18,989	18,989	18,989	18,989
		MUNICIPAL	1,595	1,623	1,653	1,688	1,729	1,774
	TRINITY-SAN JACINTO	IRRIGATION	2,185	2,185	2,185	2,185	2,185	2,185
		LIVESTOCK	48	49	51	52	53	54
		MINING	4,722	4,722	4,722	4,672	4,601	4,502
		MUNICIPAL	821	891	950	996	1,040	1,084
		STEAM ELECTRIC POWER	30,000	30,000	30,000	30,000	30,000	30,000
FORT BEND	BRAZOS	IRRIGATION	12,000	12,000	12,000	12,000	12,000	12,000
		LIVESTOCK	0	207	415	415	415	415
		MANUFACTURING	400	400	400	400	400	400
		MUNICIPAL	15,242	16,028	16,131	16,259	16,515	16,822
		STEAM ELECTRIC POWER	111,711	111,711	111,711	111,711	111,711	111,711
	SAN JACINTO	LIVESTOCK	13	30	47	47	47	47
		MINING	8	8	8	8	8	8
		MUNICIPAL	8,529	18,494	18,408	18,680	19,121	19,261
	SAN JACINTO-BRAZOS	IRRIGATION	2,143	2,143	2,143	2,143	2,143	2,143
		LIVESTOCK	64	98	139	139	139	139
		MANUFACTURING	1,000	1,000	1,000	1,000	1,000	1,000
		MINING	517	517	517	517	517	517
MUNICIPAL		19,478	31,008	33,159	34,283	35,559	36,584	
GALVESTON	NECHES-TRINITY	MINING	106	106	106	106	106	106
		MUNICIPAL	5,550	5,500	5,450	5,400	5,350	5,300

County	Basin	Use	Available Supplies (acre-feet per year)					
			Year 2010	Year 2020	Year 2030	Year 2040	Year 2050	Year 2060
	SAN JACINTO-BRAZOS	IRRIGATION	142	142	142	142	142	142
		LIVESTOCK	306	296	280	280	280	281
		MANUFACTURING	68,414	68,414	68,414	68,414	68,414	68,414
		MINING	101	101	101	101	101	101
		MUNICIPAL	77,993	78,258	78,403	78,465	78,509	78,538
		STEAM ELECTRIC POWER	2,231	2,231	2,231	2,231	2,231	2,231
HARRIS	SAN JACINTO	IRRIGATION	1,476	1,476	1,476	1,476	1,476	1,476
		LIVESTOCK	324	666	803	803	803	803
		MANUFACTURING	364,933	364,933	364,961	364,970	364,975	364,973
		MINING	992	992	992	992	992	992
		MUNICIPAL	404,719	435,032	464,366	499,737	537,217	543,310
		STEAM ELECTRIC POWER	14,369	14,369	14,369	14,369	14,369	14,369
	SAN JACINTO-BRAZOS	LIVESTOCK	82	82	82	82	82	82
		MANUFACTURING	55,739	55,739	55,711	55,702	55,697	55,699
		MINING	19	19	19	19	19	19
		MUNICIPAL	58,484	60,167	61,852	63,786	65,854	66,182
	TRINITY-SAN JACINTO	IRRIGATION	1,355	1,355	1,355	1,355	1,355	1,355
		LIVESTOCK	73	73	73	73	73	73
		MANUFACTURING	42,345	42,345	42,345	42,345	42,345	42,345
		MUNICIPAL	17,100	17,033	16,978	16,934	16,892	16,851
LIBERTY	NECHES	IRRIGATION	2,500	2,500	2,500	2,500	2,500	2,500
		LIVESTOCK	45	45	45	45	45	70
	NECHES-TRINITY	IRRIGATION	19,269	19,228	19,199	19,170	19,134	19,093
	TRINITY	IRRIGATION	44,113	44,420	44,631	44,860	45,125	45,438
		MUNICIPAL	72	71	72	73	77	80
	TRINITY-SAN JACINTO	IRRIGATION	685	685	685	685	685	685
LIVESTOCK		0	0	0	0	0	17	
MONTGOMERY	SAN JACINTO	IRRIGATION	880	880	880	880	880	880
		LIVESTOCK	510	510	510	510	510	510
		STEAM ELECTRIC POWER	7,841	7,841	7,841	7,841	7,841	7,841
POLK	TRINITY	MUNICIPAL	6,236	6,225	6,221	6,221	6,230	6,237
SAN JACINTO	SAN JACINTO	MUNICIPAL	63	70	73	75	75	74
	TRINITY	IRRIGATION	135	135	135	135	135	135
		MUNICIPAL	977	990	1,004	1,013	1,012	1,008
TRINITY	TRINITY	IRRIGATION	290	290	290	290	290	290
		LIVESTOCK	211	211	211	211	211	211
		MUNICIPAL	5,615	5,598	5,590	5,587	5,577	5,573
WALKER	SAN JACINTO	LIVESTOCK	0	1	12	8	9	11
		MUNICIPAL	17,606	17,211	17,244	17,291	17,367	17,454
	TRINITY	LIVESTOCK	106	127	138	143	148	154
		MUNICIPAL	4,925	5,322	5,283	5,230	5,157	5,073
WALLER	BRAZOS	LIVESTOCK	232	232	232	232	242	277
	SAN JACINTO	LIVESTOCK	90	90	90	90	102	107
Total			1,843,815	1,899,087	1,932,954	1,971,925	2,013,605	2,021,690

Table 3-16
Groundwater Supply by Categories of Water Use in Each County and Basin

County	Basin	Use	Available Supplies (acre-feet per year)					
			Year 2010	Year 2020	Year 2030	Year 2040	Year 2050	Year 2060
AUSTIN	BRAZOS	IRRIGATION	743	743	743	743	743	743
		LIVESTOCK	1,211	1,211	1,211	1,211	1,211	1,211
		MANUFACTURING	172	172	172	172	172	172
		MINING	40	40	40	40	40	40
		MUNICIPAL	3,638	3,462	3,353	3,283	3,250	3,215
	BRAZOS-COLORADO	IRRIGATION	9,874	9,874	9,874	9,874	9,874	9,874
		LIVESTOCK	339	339	339	339	339	339
		MANUFACTURING	38	38	38	38	38	38
		MINING	4	4	4	4	4	4
		MUNICIPAL	459	459	459	459	459	459
	COLORADO	LIVESTOCK	13	9	7	6	5	4
		MINING	7	7	7	7	7	7
		MUNICIPAL	26	26	26	26	26	26
BRAZORIA	BRAZOS	LIVESTOCK	22	14	10	7	6	4
		MANUFACTURING	24,125	4,493	4,026	3,597	3,116	2,600
		MINING	117	28	28	28	28	28
		MUNICIPAL	2,257	2,122	2,097	2,075	2,056	2,045
	BRAZOS-COLORADO	IRRIGATION	4,765	4,277	4,089	3,976	3,976	3,976
		LIVESTOCK	204	202	198	194	187	179
		MINING	1,728	1,440	1,440	1,440	1,440	1,440
		MUNICIPAL	2,869	2,858	2,847	2,834	2,827	2,825
	SAN JACINTO-BRAZOS	LIVESTOCK	423	423	421	377	325	278
		MINING	640	624	624	624	624	624
		MUNICIPAL	13,250	13,113	13,082	13,058	13,051	13,053
	CHAMBERS	NECHES-TRINITY	IRRIGATION	3,890	3,884	3,880	3,879	3,876
LIVESTOCK			16	16	16	16	16	15
MINING			30	30	30	30	30	30
MUNICIPAL			47	45	43	42	41	40
TRINITY		IRRIGATION	5,688	5,464	5,330	5,207	5,089	4,988
		LIVESTOCK	10	10	10	10	9	9
		MINING	4,907	4,907	4,907	4,907	4,907	4,907
		MUNICIPAL	201	197	195	193	191	190
TRINITY-SAN JACINTO		IRRIGATION	530	509	472	439	409	379
		LIVESTOCK	21	20	18	17	16	15
		MANUFACTURING	3,538	3,538	3,538	3,538	3,538	3,538
		MINING	2,561	2,561	2,561	2,511	2,440	2,341
		MUNICIPAL	282	278	273	268	265	262
		STEAM ELECTRIC POWER	1,330	1,018	1,104	1,208	1,332	1,468

FORT BEND	BRAZOS	IRRIGATION	5,907	5,907	5,907	5,907	5,907	5,907	
		LIVESTOCK	691	484	276	276	276	276	
		MANUFACTURING	1,235	907	538	538	538	538	
		MINING	618	441	255	255	255	255	
		MUNICIPAL	30,481	23,372	16,990	16,966	16,966	16,966	
		STEAM ELECTRIC POWER	11,316	11,316	11,316	11,316	11,316	11,316	
	BRAZOS-COLORADO	IRRIGATION	18,869	18,869	18,869	18,869	18,869	18,869	
		LIVESTOCK	211	211	211	211	211	211	
		MINING	140	140	140	140	140	140	
		MUNICIPAL	706	552	662	720	798	819	
	SAN JACINTO	IRRIGATION	7,538	7,538	7,538	7,538	7,538	7,538	
		LIVESTOCK	57	40	23	23	23	23	
		MANUFACTURING	1,979	1,453	862	862	862	855	
		MINING	272	200	116	116	116	116	
		MUNICIPAL	28,134	25,090	16,923	16,913	16,910	16,910	
	SAN JACINTO-BRAZOS	IRRIGATION	6,998	6,998	6,998	6,998	6,998	6,998	
LIVESTOCK		135	101	60	60	60	60		
MANUFACTURING		3,649	2,679	1,588	1,588	1,588	1,588		
MINING		1,455	1,408	814	822	830	838		
MUNICIPAL		46,394	41,389	31,085	31,051	31,049	30,149		
GALVESTON	NECHES-TRINITY	LIVESTOCK	2	2	2	2	2	2	
		MINING	14	14	14	14	14	14	
	SAN JACINTO-BRAZOS	IRRIGATION	1,020	1,020	1,020	1,020	1,020	1,020	
		LIVESTOCK	3	3	3	3	3	3	
		MANUFACTURING	4,101	4,101	4,101	4,101	4,101	4,101	
		MINING	13	13	13	13	13	13	
		MUNICIPAL	4,444	4,395	4,349	4,303	4,273	4,275	
	HARRIS	SAN JACINTO	IRRIGATION	9,883	9,883	9,883	9,883	9,883	9,883
			LIVESTOCK	666	285	190	190	190	190
MANUFACTURING			51,293	51,293	51,293	51,293	51,293	51,293	
MINING			126	126	126	126	126	126	
MUNICIPAL			253,507	168,337	147,713	147,659	147,639	147,647	
SAN JACINTO-BRAZOS		LIVESTOCK	9	9	9	9	9	9	
		MANUFACTURING	6,692	6,692	6,692	6,692	6,692	6,692	
		MINING	2	2	2	2	2	2	
		MUNICIPAL	6,002	5,279	5,222	5,124	5,111	5,120	
		STEAM ELECTRIC POWER	44	44	44	44	44	44	
TRINITY-SAN JACINTO		IRRIGATION	5,417	5,417	5,417	5,417	5,417	5,417	
		LIVESTOCK	18	18	18	18	18	18	
		MANUFACTURING	7,261	7,261	7,261	7,261	7,261	7,261	
		MUNICIPAL	1,528	1,408	1,452	1,452	1,452	1,452	
LEON	BRAZOS	LIVESTOCK	423	423	423	423	423	423	
		MINING	221	213	209	205	201	198	
		MUNICIPAL	488	488	488	488	488	488	
	TRINITY	IRRIGATION	542	542	542	542	542	542	

		LIVESTOCK	1,268	1,268	1,268	1,268	1,268	1,268
		MANUFACTURING	714	714	714	714	714	714
		MINING	1,296	1,251	1,226	1,204	1,183	1,166
		MUNICIPAL	1,640	1,640	1,640	1,640	1,640	1,640
LIBERTY	NECHES	IRRIGATION	12	12	12	12	12	12
		LIVESTOCK	59	59	59	59	59	34
		MINING	32	32	32	32	32	32
		MUNICIPAL	241	241	241	241	241	241
	NECHES-TRINITY	IRRIGATION	375	374	372	369	368	367
		LIVESTOCK	35	35	35	35	35	35
		MINING	23	23	23	23	23	22
		MUNICIPAL	11	11	11	11	11	11
	SAN JACINTO	IRRIGATION	830	830	830	830	830	830
		LIVESTOCK	140	140	140	140	140	140
		MANUFACTURING	331	331	331	331	331	331
		MINING	34	34	34	34	34	34
		MUNICIPAL	2,865	2,865	2,865	2,865	2,865	2,865
	TRINITY	IRRIGATION	10,367	8,078	6,416	4,597	2,447	0
		LIVESTOCK	446	446	446	446	446	446
		MANUFACTURING	62	62	62	62	62	62
		MINING	4,924	4,880	4,836	4,794	4,747	4,695
		MUNICIPAL	7,166	7,166	7,166	7,166	7,166	7,166
		STEAM ELECTRIC POWER	2,962	2,962	2,962	2,962	2,962	2,962
	TRINITY-SAN JACINTO	IRRIGATION	5,683	5,643	5,608	5,573	5,535	5,507
		LIVESTOCK	32	32	32	32	32	15
		MINING	3,717	3,717	3,717	3,717	3,717	3,717
		MUNICIPAL	187	187	187	187	187	187
	MADISON	BRAZOS	LIVESTOCK	120	120	120	120	120
MINING			9	9	9	9	9	9
MUNICIPAL			106	106	106	106	106	106
TRINITY		IRRIGATION	19	19	19	19	19	19
		LIVESTOCK	630	630	630	630	630	630
		MANUFACTURING	260	260	260	260	260	260
		MINING	15	15	15	15	15	15
		MUNICIPAL	1,687	1,660	1,643	1,692	1,688	1,657
MONTGOMERY	SAN JACINTO	IRRIGATION	51	38	31	26	21	18
		LIVESTOCK	393	293	239	199	161	132
		MANUFACTURING	1,576	1,344	1,224	1,127	997	888
		MINING	370	293	247	212	177	148
		MUNICIPAL	57,722	52,532	53,909	52,949	49,746	47,142
		STEAM ELECTRIC POWER	3,888	3,885	3,879	3,873	3,864	3,852
POLK	TRINITY	LIVESTOCK	134	134	134	134	134	134
		MINING	29	29	29	29	29	29
		MUNICIPAL	2,919	2,919	2,919	2,919	2,919	2,919
SAN JACINTO	SAN JACINTO	LIVESTOCK	142	142	142	142	142	142

		MANUFACTURING	48	48	48	48	48	48
		MINING	23	23	22	21	20	20
		MUNICIPAL	1,345	1,345	1,345	1,345	1,345	1,345
	TRINITY	IRRIGATION	532	532	532	532	532	532
		LIVESTOCK	142	142	142	142	142	142
		MINING	7	6	6	6	6	6
		MUNICIPAL	2,650	2,650	2,650	2,650	2,650	2,551
TRINITY	TRINITY	IRRIGATION	467	467	467	467	467	467
		MINING	6	6	6	6	6	6
		MUNICIPAL	805	805	800	782	762	734
WALKER	SAN JACINTO	IRRIGATION	5	5	5	5	5	5
		LIVESTOCK	310	309	298	302	301	299
		MANUFACTURING	577	577	577	577	577	577
		MINING	7	7	7	7	7	7
		MUNICIPAL	8,546	6,422	6,714	6,444	6,548	6,602
	TRINITY	IRRIGATION	6	6	6	6	6	6
		LIVESTOCK	216	195	184	179	174	168
		MANUFACTURING	2,631	2,422	2,111	2,312	2,352	2,369
		MINING	6	6	6	6	6	6
		MUNICIPAL	4,080	4,254	4,359	3,739	3,434	3,049
WALLER	BRAZOS	IRRIGATION	4,825	4,825	4,825	4,825	4,825	4,825
		LIVESTOCK	444	444	444	444	434	399
		MANUFACTURING	17	17	17	17	17	17
		MINING	9	9	9	9	9	9
		MUNICIPAL	4,061	4,061	4,061	4,061	4,061	4,061
	SAN JACINTO	IRRIGATION	18,153	17,679	18,153	18,140	16,561	14,755
		LIVESTOCK	173	173	173	173	161	156
		MANUFACTURING	72	72	72	72	72	72
		MINING	71	71	71	71	71	71
		MUNICIPAL	1,570	1,502	1,491	1,491	1,491	1,491
Total			777,845	641,359	591,590	586,814	578,644	569,361

Table 3-17

Reuse Supply by Categories of Water Use in Each County and Basin

County	Basin	Use	Available Supplies (acre-feet per year)					
			Year 2010	Year 2020	Year 2030	Year 2040	Year 2050	Year 2060
MONTGOMERY	SAN JACINTO	MUNICIPAL	0	0	438	14,799	14,840	14,866
Total			0	0	438	14,799	14,840	14,866

Appendix 3A

Current Water Supply Sources Available
During Drought of Record Conditions

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Region H
Table 3A-1: Current Water Supply Sources Available During Drought of Record Conditions

Source Name	Source Type	Source RWPG	Source Basin	Source County	Basin ID	County ID	Source ID	Source Supply (acre-ft./year)					
								2010	2020	2030	2060	2060	
BRAZOS RIVER ALLUVIUM AQUIFER	01-GW	H	BRAZOS	AUSTIN	12	008	00805	8,607	8,607	8,607	8,607	8,607	8,607
GULF COAST AQUIFER	01-GW	H	BRAZOS	AUSTIN	13	008	00815	9,668	9,668	9,668	9,668	9,668	9,668
GULF COAST AQUIFER	01-GW	H	BRAZOS-COLORADO	AUSTIN	13	008	00815	11,200	11,200	11,200	11,200	11,200	11,200
GULF COAST AQUIFER	01-GW	H	COLORADO	AUSTIN	14	008	00815	46	46	46	46	46	46
GULF COAST AQUIFER	01-GW	H	SAN JACINTO-BRAZOS	BRAZORIA	11	020	02015	35,904	35,904	35,904	35,904	35,904	35,904
GULF COAST AQUIFER	01-GW	H	BRAZOS	BRAZORIA	12	020	02015	7,192	7,192	7,192	7,192	7,192	7,192
GULF COAST AQUIFER	01-GW	H	BRAZOS-COLORADO	BRAZORIA	13	020	02015	7,304	7,304	7,304	7,304	7,304	7,304
UNDIFFERENTIATED AQUIFER	01-GW	H	SAN JACINTO-BRAZOS	BRAZORIA	11	020	02022	167	167	167	167	167	167
GULF COAST AQUIFER	01-GW	H	NECHES-TRINITY	CHAMBERS	07	036	03615	3,990	3,990	3,990	3,990	3,990	3,990
GULF COAST AQUIFER	01-GW	H	TRINITY	CHAMBERS	08	036	03615	10,806	10,806	10,806	10,806	10,806	10,806
GULF COAST AQUIFER	01-GW	H	TRINITY-SAN JACINTO	CHAMBERS	09	036	03615	8,205	8,205	8,205	8,205	8,205	8,205
SAM RAYBURN-STEINHAGEN LAKE/RESERVOIR SYSTEM	00-SW	I	NECHES	RESERVOIR	06	079	060A0	820,000	820,000	820,000	820,000	820,000	820,000
BRAZOS RIVER ALLUVIUM AQUIFER	01-GW	H	BRAZOS	RESERVOIR	12	079	07905	23,452	23,452	23,452	23,452	23,452	23,452
GULF COAST AQUIFER	01-GW	H	SAN JACINTO	FORT BEND	10	079	07915	39,095	35,294	26,088	26,073	26,073	26,066
GULF COAST AQUIFER	01-GW	H	SAN JACINTO-BRAZOS	FORT BEND	11	079	07915	58,704	59,008	43,197	43,085	43,171	42,325
GULF COAST AQUIFER	01-GW	H	BRAZOS	FORT BEND	12	079	07915	43,577	36,306	29,505	29,715	30,073	30,490
GULF COAST AQUIFER	01-GW	H	BRAZOS-COLORADO	FORT BEND	13	079	07915	26,649	25,320	20,459	20,459	20,627	20,905
LIVINGSTON-WALLISVILLE LAKE/RESERVOIR	00-SW	H	TRINITY	RESERVOIR	08	084	084H0	1,344,000	1,289,000	1,265,000	1,294,000	1,344,000	1,344,000
GULF COAST AQUIFER	01-GW	H	NECHES-TRINITY	GALVESTON	07	084	08415	30	30	31	31	31	31
GULF COAST AQUIFER	01-GW	H	SAN JACINTO-BRAZOS	GALVESTON	11	084	08415	10,084	10,343	10,837	10,769	10,761	10,763
HOUSTON LAKE/RESERVOIR	00-SW	H	SAN JACINTO	RESERVOIR	10	084	10030	187,000	184,200	181,400	178,600	175,800	173,000
GULF COAST AQUIFER	01-GW	H	TRINITY-SAN JACINTO	HARRIS	09	101	10115	14,284	14,699	15,202	15,206	15,211	15,216
GULF COAST AQUIFER	01-GW	H	SAN JACINTO	HARRIS	10	101	10115	317,587	245,596	236,106	236,053	236,035	236,045
GULF COAST AQUIFER	01-GW	H	SAN JACINTO-BRAZOS	HARRIS	11	101	10115	9,682	10,355	11,087	10,969	10,976	10,985
NECHES-TRINITY RIVER RUN-OF-RIVER	00-SW	H	NECHES-TRINITY	CHAMBERS	07	036	3410704290	1,037	1,037	1,037	1,037	1,037	1,037
NECHES-TRINITY RIVER RUN-OF-RIVER	00-SW	H	NECHES-TRINITY	CHAMBERS	07	036	3410704291	1,078	1,078	1,078	1,078	1,078	1,078
NECHES-TRINITY RIVER RUN-OF-RIVER	00-SW	H	NECHES-TRINITY	CHAMBERS	07	036	3410704295	1,199	1,199	1,199	1,199	1,199	1,199
NECHES-TRINITY RIVER RUN-OF-RIVER	00-SW	H	NECHES-TRINITY	CHAMBERS	07	036	3410704299	1,173	1,173	1,173	1,173	1,173	1,173
NECHES-TRINITY RIVER RUN-OF-RIVER	00-SW	H	NECHES-TRINITY	CHAMBERS	07	036	3410704306	1,818	1,818	1,818	1,818	1,818	1,818
NECHES-TRINITY RIVER RUN-OF-RIVER	00-SW	H	NECHES-TRINITY	CHAMBERS	07	036	3410704311	2,072	2,072	2,072	2,072	2,072	2,072
NECHES-TRINITY RIVER RUN-OF-RIVER	00-SW	H	NECHES-TRINITY	CHAMBERS	07	036	3410705016	1,012	1,012	1,012	1,012	1,012	1,012
SAN JACINTO-BRAZOS RIVER RUN-OF-RIVER	00-SW	H	SAN JACINTO-BRAZOS	BRAZORIA	11	020	3411104449	1,200	1,200	1,200	1,200	1,200	1,200
BRAZOS RIVER AUTHORITY SYSTEM	00-SW	H	SAN JACINTO-BRAZOS	RESERVOIR	11	020	3411104509	2,028	2,028	2,028	2,028	2,028	2,028
CARRIZO-WILCOX AQUIFER	01-GW	G	BRAZOS	RESERVOIR	12	145	120E0	727,228	718,350	709,472	700,594	691,717	691,717
CARRIZO-WILCOX AQUIFER	01-GW	H	TRINITY	LEON	08	145	14510	5,213	4,715	4,599	4,556	4,562	4,562
QUEEN CITY AQUIFER	01-GW	H	BRAZOS	LEON	12	145	14510	1,051	1,013	1,006	993	996	996
QUEEN CITY AQUIFER	01-GW	H	TRINITY	LEON	08	145	14524	4,860	4,860	4,860	4,860	4,860	4,860
QUEEN CITY AQUIFER	01-GW	H	BRAZOS	LEON	12	145	14524	201	201	201	201	201	201
SPARTA AQUIFER	01-GW	H	TRINITY	LEON	08	145	14527	6,895	6,895	6,895	6,895	6,895	6,895
GULF COAST AQUIFER	01-GW	H	BRAZOS	LEON	12	145	14527	497	497	497	497	497	497
GULF COAST AQUIFER	01-GW	H	NECHES	LIBERTY	06	146	14615	4,414	4,414	4,414	4,414	4,414	4,414
GULF COAST AQUIFER	01-GW	H	NECHES-TRINITY	LIBERTY	07	146	14615	444	444	444	444	444	444
GULF COAST AQUIFER	01-GW	H	TRINITY	LIBERTY	08	146	14615	21,857	21,857	21,857	21,857	21,857	21,857
GULF COAST AQUIFER	01-GW	H	TRINITY-SAN JACINTO	LIBERTY	09	146	14615	9,619	9,619	9,619	9,619	9,619	9,619
GULF COAST AQUIFER	01-GW	H	SAN JACINTO	LIBERTY	10	146	14615	6,887	6,887	6,887	6,887	6,887	6,887
CARRIZO-WILCOX AQUIFER	01-GW	H	TRINITY	MADISON	08	157	15710	1,460	1,431	1,401	1,354	1,328	1,328
UNDIFFERENTIATED AQUIFER	01-GW	H	BRAZOS	MADISON	12	157	15710	227	217	208	197	190	190
QUEEN CITY AQUIFER	01-GW	H	TRINITY	MADISON	08	157	15722	2,625	2,625	2,625	2,625	2,625	2,625
QUEEN CITY AQUIFER	01-GW	H	BRAZOS	MADISON	12	157	15724	145	145	145	145	145	145
SPARTA AQUIFER	01-GW	H	TRINITY	MADISON	08	157	15727	7,576	7,576	7,576	7,576	7,576	7,576
SPARTA AQUIFER	01-GW	H	BRAZOS	MADISON	12	157	15727	441	441	441	441	441	441
GULF COAST AQUIFER	01-GW	H	SAN JACINTO	MONTGOMERY	10	170	17015	64,000	64,000	64,000	64,000	64,000	64,000
GULF COAST AQUIFER	01-GW	H	TRINITY	POLK	08	187	18715	19,117	19,117	19,117	19,117	19,117	19,117
GULF COAST AQUIFER	01-GW	H	TRINITY	SAN JACINTO	08	204	20415	9,863	9,863	9,863	9,863	9,863	9,863
GULF COAST AQUIFER	01-GW	H	SAN JACINTO	SAN JACINTO	10	204	20415	12,006	12,006	12,006	12,006	12,006	12,006
CARRIZO-WILCOX AQUIFER	01-GW	H	TRINITY	TRINITY	08	228	22810	249	249	249	241	241	241
UNDIFFERENTIATED AQUIFER	01-GW	H	TRINITY	TRINITY	08	228	22815	3,714	3,714	3,714	3,714	3,714	3,714
SPARTA AQUIFER	01-GW	H	TRINITY	TRINITY	08	228	22822	416	416	416	416	416	416
SPARTA AQUIFER	01-GW	H	TRINITY	TRINITY	08	228	22827	245	245	245	245	245	245

Table 3A-1: Current Water Supply Sources Available During Drought of Record Conditions

Source Name	Source Type	Source R/WPG	Source Basin	Source County	Basin ID	County ID	Source ID	Source Supply (acre-ft./year)						
								2010	2020	2030	2040	2060	2060	
CARRIZO-WILCOX AQUIFER	01-GW	H	TRINITY	WALKER	08	236	23610	2,293	2,293	2,293	2,293	2,293	2,293	2,293
GULF COAST AQUIFER	01-GW	H	TRINITY	WALKER	08	236	23615	5,845	5,845	5,845	5,845	5,845	5,845	5,845
GULF COAST AQUIFER	01-GW	H	SAN JACINTO	WALKER	10	236	23615	12,434	12,434	12,434	12,434	12,434	12,434	12,434
UNDIFFERENTIATED AQUIFER	01-GW	H	TRINITY	WALKER	08	236	23622	200	200	200	200	200	200	200
QUEEN CITY AQUIFER	01-GW	H	TRINITY	WALKER	08	236	23624	75	75	75	75	75	75	75
SPARTA AQUIFER	01-GW	H	TRINITY	WALKER	08	236	23627	1,760	1,760	1,760	1,760	1,760	1,760	1,760
YEGUA-JACKSON AQUIFER	01-GW	H	TRINITY	WALKER	08	236	23631	5,440	5,440	5,440	5,440	5,440	5,440	5,440
YEGUA-JACKSON AQUIFER	01-GW	H	SAN JACINTO	WALKER	10	236	23705	9,480	9,480	9,480	9,480	9,480	9,480	9,480
BRAZOS RIVER ALLUVIUM AQUIFER	01-GW	H	BRAZOS	WALKER	12	237	23705	9,480	9,480	9,480	9,480	9,480	9,480	9,480
GULF COAST AQUIFER	01-GW	H	SAN JACINTO	WALKER	10	237	23715	13,086	13,086	13,086	13,086	13,086	13,086	13,086
GULF COAST AQUIFER	01-GW	H	BRAZOS	WALKER	12	237	23715	15,416	15,416	15,416	15,416	15,416	15,416	15,416
TRINITY RIVER RUN-OF-RIVER	00-SW	H	TRINITY	LIBERTY	08	146	3410805271A	2,500	2,500	2,500	2,500	2,500	2,500	2,500
TRINITY RIVER RUN-OF-RIVER	00-SW	H	TRINITY	LIBERTY	08	146	3410805271B	56,000	56,000	56,000	56,000	56,000	56,000	56,000
BRAZOS RIVER RUN-OF-RIVER	00-SW	H	BRAZOS	FORT BEND	12	079	3461205168	84,000	84,124	84,197	84,230	84,258	84,281	84,281
BRAZOS RIVER RUN-OF-RIVER	00-SW	H	BRAZOS	FORT BEND	12	079	3461205171	61,083	61,083	61,083	61,083	61,083	61,083	61,083
NECHES-TRINITY RIVER RUN-OF-RIVER	00-SW	H	NECHES-TRINITY	CHAMBERS	07	036	3460704287	2,528	2,528	2,528	2,528	2,528	2,528	2,528
NECHES-TRINITY RIVER RUN-OF-RIVER	00-SW	H	NECHES-TRINITY	CHAMBERS	07	036	3460704293	1,626	1,626	1,626	1,626	1,626	1,626	1,626
NECHES-TRINITY RIVER RUN-OF-RIVER	00-SW	H	NECHES-TRINITY	CHAMBERS	07	036	3460704304B	1,997	1,997	1,997	1,997	1,997	1,997	1,997
TRINITY RIVER RUN-OF-RIVER	00-SW	H	TRINITY	POLK	08	187	3460804261	26,510	26,510	26,510	26,510	26,510	26,510	26,510
TRINITY RIVER RUN-OF-RIVER	00-SW	H	TRINITY	LIBERTY	08	146	3460804277	33,000	33,000	33,000	33,000	33,000	33,000	33,000
TRINITY RIVER RUN-OF-RIVER	00-SW	H	TRINITY	CHAMBERS	08	036	3460804279B	76,520	76,520	76,520	76,520	76,520	76,520	76,520
TRINITY RIVER RUN-OF-RIVER	00-SW	H	TRINITY	CHAMBERS	08	036	3460804279	30,000	30,000	30,000	30,000	30,000	30,000	30,000
TRINITY-SAN JACINTO RIVER RUN-OF-RIVER	00-SW	H	TRINITY-SAN JACINTO	CHAMBERS	09	036	3460903926	30,000	30,000	30,000	30,000	30,000	30,000	30,000
SAN JACINTO RIVER RUN-OF-RIVER	00-SW	H	SAN JACINTO	HARRIS	10	101	3461004964	55,000	55,000	55,000	55,000	55,000	55,000	55,000
SAN JACINTO-BRAZOS RIVER RUN-OF-RIVER	00-SW	H	SAN JACINTO-BRAZOS	RAZORIA	11	020	3461105357A	15,930	15,930	15,930	15,930	15,930	15,930	15,930
SAN JACINTO-BRAZOS RIVER RUN-OF-RIVER	00-SW	H	SAN JACINTO-BRAZOS	RAZORIA	11	020	3461105357B	0	0	0	0	0	0	0
SAN JACINTO-BRAZOS RIVER RUN-OF-RIVER	00-SW	H	BRAZOS	FORT BEND	12	079	3461205320	29,920	29,920	29,920	29,920	29,920	29,920	29,920
BRAZOS RIVER RUN-OF-RIVER	00-SW	H	BRAZOS	FORT BEND	12	079	3461205322B	52,980	52,980	52,980	52,980	52,980	52,980	52,980
BRAZOS RIVER RUN-OF-RIVER	00-SW	H	BRAZOS	FORT BEND	12	079	3461205325	34,300	34,300	34,300	34,300	34,300	34,300	34,300
BRAZOS RIVER RUN-OF-RIVER	00-SW	H	BRAZOS	FORT BEND	12	079	3461205325	137,475	137,475	137,475	137,475	137,475	137,475	137,475
BRAZOS RIVER RUN-OF-RIVER	00-SW	H	BRAZOS	RAZORIA	12	020	3461205328B	16,492	16,492	16,492	16,492	16,492	16,492	16,492
BRAZOS RIVER RUN-OF-RIVER	00-SW	H	BRAZOS	RAZORIA	12	020	3461205366	1,800	1,800	1,800	1,800	1,800	1,800	1,800
BRAZOS RIVER RUN-OF-RIVER	00-SW	H	BRAZOS	CHAMBERS	07	036	3460704294	573	573	573	573	573	573	573
NECHES-TRINITY RIVER RUN-OF-RIVER	00-SW	H	NECHES-TRINITY	CHAMBERS	07	036	3460704300	805	805	805	805	805	805	805
NECHES-TRINITY RIVER RUN-OF-RIVER	00-SW	H	NECHES-TRINITY	CHAMBERS	07	036	3460704304	2,663	2,663	2,663	2,663	2,663	2,663	2,663
NECHES-TRINITY RIVER RUN-OF-RIVER	00-SW	H	NECHES-TRINITY	CHAMBERS	07	036	3460704308	771	771	771	771	771	771	771
NECHES-TRINITY RIVER RUN-OF-RIVER	00-SW	H	NECHES-TRINITY	CHAMBERS	07	036	3460704309	711	711	711	711	711	711	711
NECHES-TRINITY RIVER RUN-OF-RIVER	00-SW	H	NECHES-TRINITY	CHAMBERS	07	036	3460704312	691	691	691	691	691	691	691
TRINITY-SAN JACINTO RIVER RUN-OF-RIVER	00-SW	H	TRINITY-SAN JACINTO	LIBERTY	09	146	3460903909	769	769	769	769	769	769	769
TRINITY-SAN JACINTO RIVER RUN-OF-RIVER	00-SW	H	TRINITY-SAN JACINTO	CHAMBERS	09	036	3460903918	976	976	976	976	976	976	976
TRINITY-SAN JACINTO RIVER RUN-OF-RIVER	00-SW	H	TRINITY-SAN JACINTO	HARRIS	09	101	3460903922	661	661	661	661	661	661	661
TRINITY-SAN JACINTO RIVER RUN-OF-RIVER	00-SW	H	TRINITY-SAN JACINTO	HARRIS	09	101	3460903923	694	694	694	694	694	694	694
TRINITY-SAN JACINTO RIVER RUN-OF-RIVER	00-SW	H	TRINITY-SAN JACINTO	CHAMBERS	09	036	3460903924	1,213	1,213	1,213	1,213	1,213	1,213	1,213
CONROE LAKE/RESERVOIR	00-SW	H	SAN JACINTO	MONTGOMERY	10	170	10060	79,800	78,700	77,600	76,500	75,400	74,300	74,300
SURA INDIRECT REUSE	00-SW	H	SAN JACINTO	MONTGOMERY	10	170	35101170	14,944	14,944	14,944	14,944	14,944	14,944	14,944
SAN JACINTO-BRAZOS RIVER RUN-OF-RIVER	00-SW	H	SAN JACINTO-BRAZOS	FORT BEND	11	079	3461105169	0	0	0	0	0	0	0
SAN JACINTO-BRAZOS RIVER RUN-OF-RIVER	00-SW	H	SAN JACINTO-BRAZOS	FORT BEND	11	079	3461105170	5,634	5,634	5,634	5,634	5,634	5,634	5,634
SAN JACINTO-BRAZOS RIVER RUN-OF-RIVER	00-SW	H	SAN JACINTO-BRAZOS	RAZORIA	11	020	3461105343	720	720	720	720	720	720	720
SAN JACINTO-BRAZOS RIVER RUN-OF-RIVER	00-SW	H	SAN JACINTO-BRAZOS	RAZORIA	11	020	3461105344	1,320	1,320	1,320	1,320	1,320	1,320	1,320
SAN JACINTO-BRAZOS RIVER RUN-OF-RIVER	00-SW	H	SAN JACINTO-BRAZOS	RAZORIA	11	020	3461105346	2,214	2,214	2,214	2,214	2,214	2,214	2,214
SAN JACINTO-BRAZOS RIVER RUN-OF-RIVER	00-SW	H	SAN JACINTO-BRAZOS	RAZORIA	11	020	3461105352	3,271	3,271	3,271	3,271	3,271	3,271	3,271
SAN JACINTO-BRAZOS RIVER RUN-OF-RIVER	00-SW	H	SAN JACINTO-BRAZOS	RAZORIA	11	020	3461105354	734	734	734	734	734	734	734
SAN JACINTO-BRAZOS RIVER RUN-OF-RIVER	00-SW	H	SAN JACINTO-BRAZOS	RAZORIA	11	020	3461105352	3,271	3,271	3,271	3,271	3,271	3,271	3,271
SAN BERNARD RIVER RUN-OF-RIVER	00-SW	H	BRAZOS-COLORADO	RAZORIA	13	020	3461303421	8,519	8,519	8,519	8,519	8,519	8,519	8,519
SAN BERNARD RIVER RUN-OF-RIVER	00-SW	H	BRAZOS-COLORADO	RAZORIA	13	020	3461303423	3,500	3,500	3,500	3,500	3,500	3,500	3,500
LIVESTOCK LOCAL SUPPLY	00-SW	H	NECHES	LIBERTY	06	146	99708146	45	45	45	45	45	45	45
LIVESTOCK LOCAL SUPPLY	00-SW	H	NECHES-TRINITY	CHAMBERS	07	036	99707036	317	317	317	317	317	317	317
LIVESTOCK LOCAL SUPPLY	00-SW	H	TRINITY	CHAMBERS	08	036	99708036	50	50	50	50	50	50	50
LIVESTOCK LOCAL SUPPLY	00-SW	H	TRINITY	TRINITY	08	228	99708228	211	211	211	211	211	211	211
LIVESTOCK LOCAL SUPPLY	00-SW	H	TRINITY	WALKER	08	236	99708236	106	127	138	143	148	154	154

Region H
Table 3A-1: Current Water Supply Sources Available During Drought of Record Conditions

Source Name	Source Type	Source RWPG	Source Basin	Source County	Basin ID	County ID	Source ID	Source Supply (acre-ft./year)					
								2010	2020	2030	2040	2060	
LIVESTOCK LOCAL SUPPLY	00-SW	H	TRINITY-SAN JACINTO	CHAMBERS	09	036	99709036	48	49	51	52	53	54
LIVESTOCK LOCAL SUPPLY	00-SW	H	TRINITY-SAN JACINTO	HARRIS	09	101	99709101	73	73	73	73	73	73
LIVESTOCK LOCAL SUPPLY	00-SW	H	TRINITY-SAN JACINTO	LIBERTY	09	146	99709146	0	0	0	0	0	17
LIVESTOCK LOCAL SUPPLY	00-SW	H	SAN JACINTO	FORT BEND	10	079	99710079	13	30	47	47	47	47
LIVESTOCK LOCAL SUPPLY	00-SW	H	SAN JACINTO	HARRIS	10	101	99710101	324	666	803	803	803	803
LIVESTOCK LOCAL SUPPLY	00-SW	H	SAN JACINTO	MONTGOMERY	10	170	99710170	510	510	510	510	510	510
LIVESTOCK LOCAL SUPPLY	00-SW	H	SAN JACINTO	WALKER	10	236	99710236	0	1	12	8	9	11
LIVESTOCK LOCAL SUPPLY	00-SW	H	SAN JACINTO	WALLER	10	237	99710237	90	90	90	90	102	107
LIVESTOCK LOCAL SUPPLY	00-SW	H	SAN JACINTO-BRAZOS	BRAZORIA	11	020	99711020	545	505	547	591	643	690
LIVESTOCK LOCAL SUPPLY	00-SW	H	SAN JACINTO-BRAZOS	FORT BEND	11	079	99711079	64	98	139	139	139	139
LIVESTOCK LOCAL SUPPLY	00-SW	H	SAN JACINTO-BRAZOS	GALVESTON	11	084	99711084	306	296	280	280	280	281
LIVESTOCK LOCAL SUPPLY	00-SW	H	SAN JACINTO-BRAZOS	HARRIS	11	101	99711101	82	82	82	82	82	82
LIVESTOCK LOCAL SUPPLY	00-SW	H	BRAZOS	BRAZORIA	12	020	99712020	220	228	232	235	236	238
LIVESTOCK LOCAL SUPPLY	00-SW	H	BRAZOS	FORT BEND	12	079	99712079	0	207	415	415	415	415
LIVESTOCK LOCAL SUPPLY	00-SW	H	BRAZOS	WALLER	12	237	9971237	232	232	232	232	242	277
LIVESTOCK LOCAL SUPPLY	00-SW	H	BRAZOS-COLORADO	BRAZORIA	13	020	99713020	200	202	206	210	217	225
LIVESTOCK LOCAL SUPPLY	00-SW	H	COLORADO	AUSTIN	14	008	99714008	52	56	58	59	60	61
OTHER LOCAL SUPPLY	00-SW	H	NECHES-TRINITY	CHAMBERS	07	036	99907036	505	505	505	505	505	505
OTHER LOCAL SUPPLY	00-SW	H	NECHES-TRINITY	GALVESTON	07	084	99907084	106	106	106	106	106	106
OTHER LOCAL SUPPLY	00-SW	H	TRINITY	CHAMBERS	08	036	99908036	18,989	18,989	18,989	18,989	18,989	18,989
OTHER LOCAL SUPPLY	00-SW	H	TRINITY-SAN JACINTO	CHAMBERS	09	036	99909036	4,722	4,722	4,722	4,722	4,722	4,722
OTHER LOCAL SUPPLY	00-SW	H	SAN JACINTO	FORT BEND	10	079	99910079	8	8	8	8	8	8
OTHER LOCAL SUPPLY	00-SW	H	SAN JACINTO	HARRIS	10	101	99910101	992	992	992	992	992	992
OTHER LOCAL SUPPLY	00-SW	H	SAN JACINTO	MONTGOMERY	10	170	99910170	0	0	0	0	0	0
OTHER LOCAL SUPPLY	00-SW	H	SAN JACINTO-BRAZOS	BRAZORIA	11	020	99911020	305	305	305	305	305	305
OTHER LOCAL SUPPLY	00-SW	H	SAN JACINTO-BRAZOS	GALVESTON	11	084	99911084	101	101	101	101	101	101
OTHER LOCAL SUPPLY	00-SW	H	SAN JACINTO-BRAZOS	HARRIS	11	101	99911101	19	19	19	19	19	19
OTHER LOCAL SUPPLY	00-SW	H	BRAZOS	BRAZORIA	12	020	99912020	190	190	190	190	190	190
OTHER LOCAL SUPPLY	00-SW	H	BRAZOS	FORT BEND	12	079	99912079	0	0	0	0	0	0
OTHER LOCAL SUPPLY	00-SW	H	BRAZOS-COLORADO	BRAZORIA	13	020	99913020	1,124	1,124	1,124	1,124	1,124	1,124
OTHER LOCAL SUPPLY	00-SW	H	BRAZOS-COLORADO	FORT BEND	13	079	99913079	0	0	0	0	0	0

Appendix 3B

WRAP Input Files

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Appendix 3B

Water Availability Model Input Files

These input files are used with the Water Rights Analysis Package (WRAP) available from the TCEQ or the Texas Water Resources Institute at Texas A&M University.

Basin	File Name(s)	Notes
Neches-Trinity	NT_wam3.dat .dis .eva .inf	1, 2
Trinity	TR_wam3_2000.dat TR_wam3_2060.dat TR_wam3_2010_LIVFY.dat TR_wam3_2020_LIVFY.dat TR_wam3_2030_LIVFY.dat TR_wam3_2040_LIVFY.dat TR_wam3_2050_LIVFY.dat TR_wam3_2060_LIVFY.dat TR_wam3_2000_anaFY.dat TR_wam3_2060_anaFY.dat Trin3.flo .dis.eva	3
Trinity-San Jacinto	TRSJ_wam3.dat .dis .eva .inf	1, 2
San Jacinto	SJ_wam3_2000.dat .dis .eva .inf SJ_wam3_2060.dat .dis .eva .inf	
San Jacinto-Brazos	SJBR_wam3.dat .dis .eva .inf	
Brazos	2010_bwam3.dat .dis .eva .inf 2060_bwam3.dat .dis .eva .inf	
Brazos-Colorado	CO_wam3.dat .dis .eva .inf	2, 4

1. The original TCEQ WAM file was used without modification.
2. A 2060 condition model was not required for this basin. There are no on-channel reservoirs in the coastal basin to be affected by sedimentation.
3. Firm yield models for Lake Livingston and Lake Anahuac, using updated area-capacity curves. The Lake Livingston model also includes partial return flows from the upper basin (varied by decade).
4. The Brazos-Colorado basin is included in the Colorado basin WAM

Model files are provided electronically (attached CD). These files may be viewed using a text editor such as Notepad or Wordpad. All four files are required to run the WRAP simulation.

The file extensions indicate the type of data included in the file:

- Root.dat Basic file containing all input data, except the hydrology related data in the following files.
- Root.inf Inflow records with naturalized streamflows
- Root.eva Evaporation records with net evaporation-precipitation rates
- Root.dis Flow distribution and watershed parameter records for transferring flows from the inflow records to other control points

Additional model runs were conducted for the San Jacinto Basin to determine the firm yield of Lakes Conroe and Houston. In these models, the diversion amount for a given reservoir is adjusted downward until a value is determined that can be reliably diverted in every year of the

simulation. This is an iterative process that balances available run-of-river supply and stored water with monthly diversion targets. These models are included in subfolders in this Appendix.

Appendix 3C

Upper Basin Return Flow and
Lake Livingston Firm Yield Analysis

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Appendix B DB07 – Region C Industrial Demands in Trinity Basin

Appendix C DB07 – Region C Conservation Supply in Trinity Basin

Appendix D DB07 – Region C Current Reuse Supplies in Trinity Basin

Appendix E DB07 – Region C WMS Reuse Supplies in Trinity Basin

Section 1– Executive Summary

1.1 Introduction

Return flows have an important impact on the magnitude and reliability of downstream water rights and have been carefully considered by the Region H Water Planning Group in previous regional water plans. Region H is comprised of eight river and coastal basins with several river basins extending through multiple planning regions. The Trinity River Basin is a major source of water supplies for both Region C and Region H. As a result, projected water demands and water management strategies in both regions have the ability to influence water supply availability. Coordination between lower Trinity Basin supplies located in Region H and upper Trinity Basin supplies in Region C is necessary to protect the firm yield of downstream water rights. During the development of both the 2001 and 2006 Region H Water Plans, the importance of upper basin return flows was recognized.

During the 2006 Region H Regional Water Plan, the firm yield of the Lake Livingston water rights was evaluated assuming that a minimum level of return flows would be available from the upper Trinity Basin throughout the planning period. The 2006 Region H Regional Water Plan took into account future conditions in the Trinity Basin by analyzing the 2060 projected return flows and proposed water management strategies. However, an analysis confirming the minimum level of return flows necessary to make the Lake Livingston water rights firm was not performed. Additionally, a decadal analysis was not performed to verify that the level of return flows projected from the upper Trinity Basin would be sufficient to firm up the Lake Livingston water rights. The analysis concluded that the permitted yield of Lake Livingston would be available throughout the planning period.

1.2 Purpose of Study

As part of the 2011 Region H Regional Water Plan, specific scope items were included to review and evaluate the 2006 Region C Regional Water Plan. The study focused on determining the level of Upper Trinity Basin return flows projected in each planning decade as a result of increased demands and levels of reuse. The Water Rights Analysis Package (WRAP) was utilized to perform the following tasks:

- Evaluate return flows available to Region H at the Oakwood Gage (gage located between Region C and Region H).
- Determine if projected return flows would be sufficient to maintain the firm yield of the Lake Livingston water rights for each planning decade.
- Identify the minimum level of return flows necessary to maintain the firm yield.
- Perform a decadal firm yield analysis on Lake Livingston water rights.

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Section 2 – Projected Return Flows

Lake Livingston is dependent upon return flows from upstream Region C in the upper Trinity Basin. As a result of its downstream location, Lake Livingston indirectly benefits from growth in the Dallas–Fort Worth Metroplex. As upstream demands increase in Region C, it is anticipated that the importation of out-of-basin supplies will increase, providing additional return flows to the lower basin. Although return flows will likely increase over time, the timing of developing reuse supplies may have an adverse effect on the Lake Livingston water rights, temporarily reducing the in-basin return flows. To calculate the projected level of return flows in the upper Trinity Basin, a desktop analysis of Region C WUG demands and reuse strategies was performed and compared to previous estimates performed by the Region C Consultant.

The analysis was performed in the following order:

- Region C WUG Demands in the Trinity Basin were obtained from the TWDB DB07 database.
- Region C conservation strategies for WUGs in the Trinity Basin were totaled from the TWDB DB07 database.
- Net demands were calculated by subtracting conservation strategy volumes from WUG demands.
- Total return flows were calculated by assuming return flow factors (RFs) from the 2008 Region C draft Conservation and Reuse Study (December, 2008).
- Existing and proposed reuse strategies were summarized from information in the *2006 Region C Regional Water Plan, Chapter 3*.
- The net instream return flows in Region C were estimated by subtracting proposed reuse volumes from total return flows.

2.1 Region C Demands

Region C demands from the 2006 Region C Regional Water Plan were summarized using data obtained from the TWDB DB07 online database. *Table 1* lists the municipal demands in the upper Trinity Basin by county and decades. Demands in the upper Trinity Basin are projected to increase to approximately 3,000,000 million acre-feet/year by 2060. The largest demand centers are Dallas, Collin, Denton and Tarrant Counties which encompass the Dallas-Fort Worth Metroplex. A full list of the WUGs and projected water demand summarized in the table below is provided in *Appendix A*.

Table 1 Projected Municipal Demands in the Upper Trinity Basin by County

Values in Acre-feet per Year

County	2010	2020	2030	2040	2050	2060
Collin	205,085	283,825	338,957	403,157	463,042	528,034
Cooke	6,806	7,711	8,658	9,459	10,641	11,669
Dallas	664,648	744,647	798,544	849,619	926,206	1,032,662
Denton	160,915	215,320	270,575	318,575	367,531	423,718
Ellis	27,766	35,225	43,561	52,850	63,927	77,145
Fannin	717	876	1,226	1,822	2,594	3,293

County	2010	2020	2030	2040	2050	2060
Freestone	2,831	3,127	3,321	3,498	3,663	3,828
Grayson	4,643	7,463	9,413	10,703	11,916	13,032
Henderson	10,316	12,495	14,645	16,862	19,553	22,888
Jack	1,089	1,177	1,256	1,321	1,385	1,449
Kaufman	17,835	25,020	30,198	34,950	40,226	46,845
Navarro	9,637	10,748	11,730	12,817	14,109	15,712
Parker	15,697	27,903	37,011	41,868	47,113	51,875
Rockwell	15,720	24,933	30,700	34,588	36,757	38,445
Tarrant	376,889	434,790	488,467	550,239	626,628	713,176
Wise	10,801	15,310	18,991	22,501	26,814	31,494
Total	1,531,395	1,850,570	2,107,253	2,364,829	2,662,105	3,015,265

The industrial demands in the Upper Trinity Basin are listed in *Table 2* by County and decade and are projected to increase to nearly 100,000 acre-feet/year by 2060. The largest demand centers are Dallas and Tarrant Counties part of the Dallas-Fort Worth Metroplex. A full list of the WUGs and projected water demand summarized in the table below is provided in *Appendix B*.

Table 2 Projected Industrial Demands by County

Values in Acre-feet per Year

County	2010	2020	2030	2040	2050	2060
Collin	3,607	4,137	4,654	5,170	5,633	6,115
Cooke	273	306	335	364	389	421
Dallas	34,115	37,791	41,148	44,214	46,703	46,983
Denton	1,068	1,239	1,408	1,579	1,731	1,880
Ellis	3,466	3,670	3,841	3,987	4,089	3,912
Fannin	0	0	0	0	0	0
Freestone	0	0	0	0	0	0
Grayson	2	2	2	2	2	2
Henderson	110	118	133	151	172	195
Jack	0	0	0	0	0	0
Kaufman	760	813	869	928	993	1,061
Navarro	1,172	1,328	1,468	1,607	1,730	1,872
Parker	548	618	685	751	809	878
Rockwell	12	14	16	17	19	21
Tarrant	17,258	20,444	23,630	26,924	29,919	32,457
Wise	2,313	2,660	2,979	3,277	3,539	3,858
Total	64,704	73,140	81,168	88,971	95,728	99,655

2.2 Projected Conservation

Projected Conservation supplies are listed below in *Table 3* by County. A full list of the WUGs and projected water demand summarized in the table below is provided in *Appendix C*.

Table 3 Projected Conservation by County

Values in Acre-feet per Year

County	2010	2020	2030	2040	2050	2060
Collin	3,607	4,137	4,654	5,170	5,633	6,115
Cooke	273	306	335	364	389	421
Dallas	34,115	37,791	41,148	44,214	46,703	46,983
Denton	1,068	1,239	1,408	1,579	1,731	1,880
Ellis	3,466	3,670	3,841	3,987	4,089	3,912
Fannin	0	0	0	0	0	0
Freestone	0	0	0	0	0	0
Grayson	2	2	2	2	2	2
Henderson	110	118	133	151	172	195
Jack	0	0	0	0	0	0
Kaufman	760	813	869	928	993	1,061
Navarro	1,172	1,328	1,468	1,607	1,730	1,872
Parker	548	618	685	751	809	878
Rockwell	12	14	16	17	19	21
Tarrant	17,258	20,444	23,630	26,924	29,919	32,457
Wise	2,313	2,660	2,979	3,277	3,539	3,858
Total	64,704	73,140	81,168	88,971	95,728	99,655

2.3 Recommended Region C Reuse Projects

Currently, direct and indirect reuse projects account for nearly 100,000 acre-feet/year of existing supply in Region C. According to 2006 Region C Water Plan, the proposed future adoption of reuse is anticipated to provide approximately 771,000 acre-feet per year of water to meet demand in Region C by 2060. The total amount of reuse recommended in the plan is approximately 795,500 acre-ft per year. Two types of reuse projects are recommended in the 2006 Region C Water Plan, direct and indirect reuse.

2.3.1 Direct Reuse Projects

The majority of the existing reuse projects identified in the 2006 Region C Water Plan are direct reuse projects. Direct reuse projects typically supply water for landscape irrigation (golf courses) and industrial uses (cooling water for electric power plants) by delivering treated wastewater effluent directly from a wastewater treatment facility. Direct reuse projects require notification of the Texas Commission on Environmental Quality (TCEQ) and must comply with direct reuse regulations in Title 30, Chapter 210 of the Texas Administrative Code. Recommended direct reuse projects included in the 2006 Region C Water Plan are listed below.

Table 4 Region C Recommended Direct Reuse Projects

Values in Acre-feet per Year

Reuse Project	2010	2020	2030	2040	2050	2060
NTMWD East Fork Reuse	81,400	96,400	102,000	102,000	102,000	102,000
TRA Tarrant County Reuse (Tarrant County-Other)	0	7,500	7,500	7,500	7,500	7,500

Reuse Project	2010	2020	2030	2040	2050	2060
TRA Mountain Creek Direct Reuse SEP (Dallas County)	0	3,000	3,000	3,000	3,000	3,000
TRA Ellis County Direct Reuse SEP	20,000	20,000	30,000	30,000	40,000	40,000
TRA Direct Reuse for County Irrigation	3,750	3,750	3,750	3,750	3,750	3,750
TRA Direct Reuse for Denton County Irrigation	3,750	3,750	3,750	3,750	3,750	3,750
TRA Freestone County Direct Reuse SEP	0	0	10,000	10,000	20,000	20,000
TRA Kaufman County Direct Reuse SEP	0	7,500	15,000	15,000	15,000	15,000
Fort Worth Direct Reuse from Village Creek WWTP	500	500	1,100	2,000	2,600	2,600
Fort Worth Direct Reuse Mary's Creek	0	1,240	1,570	1,570	1,570	1,570
Fort Worth Direct Reuse Central Business District	0	2,240	3,360	3,360	3,360	3,360
Fort Worth Direct Reuse - Alliance Corridor	0	1,120	2,240	3,360	3,360	3,360
Bridgeport Direct Reuse	0	0	0	1,500	2,000	2,000
Decatur Direct Reuse	0	0	0	2,000	2,000	2,000
Local Mining Reuse	14,337	14,133	22,428	19,652	24,648	28,520
Total	123,737	161,133	205,698	208,442	234,538	238,410

2.3.2 Indirect Reuse Projects

Indirect reuse involves the discharge of treated wastewater into a stream or reservoir and subsequent diversion for reuse. The process allows the treated wastewater effluent to “blend” with the “natural” waters of the stream or reservoir prior to being diverted for use. In Region H many sources rely on the return flows from treated wastewater effluent as well as naturally occurring runoff. Recommended indirect reuse projects included in the 2006 Region C Water Plan are listed below.

Table 5 Region C Recommended Indirect Reuse Projects

Values in Acre-feet per Year

Reuse Project	2010	2020	2030	2040	2050	2060
NTMWD Additional Wilson Creek Indirect Reuse	26,956	35,941	35,941	35,941	35,941	35,941
DWU Direct Reuse	20,456	20,456	20,456	20,456	20,456	20,456
DWU Southside Indirect Reuse	0	67,253	67,253	67,253	67,253	67,253
DWU Lewisville Indirect Reuse	0	0	67,253	67,253	67,253	67,253
DWU and UTRWD Indirect Reuse of Return Flows above Dallas Lakes	34,366	44,746	53,141	60,640	69,854	79,605
TRWD Trinity River Reuse (Richland-Chambers)	63,000	63,000	63,000	63,000	63,000	63,000
TRWD Trinity River Reuse (Cedar Creek)	0	52,500	52,500	52,500	52,500	52,500
TRWD Additional Yield from Richland-Chambers due to reuse	21,556	28,612	35,668	37,465	37,465	37,465

Reuse Project	2010	2020	2030	2040	2050	2060
project						
TRWD Additional Yield from Cedar Creek due to reuse project	0	24,934	27,651	30,368	33,085	35,800
TRA Joe Pool Lake Indirect Reuse	0	20,000	20,000	20,000	20,000	20,000
TRA Joe Pool Lake Indirect Reuse	0	3,500	3,500	3,500	3,500	3,500
UTRWD Indirect Reuse of Chapman Lake	8,441	8,301	8,161	8,021	7,882	7,743
Athens Indirect Reuse	1,662	1,966	2,325	2,677	2,677	2,677
Ennis Indirect Reuse	0	0	74	1,037	2,269	3,696
TRA Additional Las Colinas Indirect Reuse		7,000	7,000	7,000	7,000	7,000
Gainesville Indirect	0	561	561	561	561	561
TRA Contract With Irving	28,000	28,000	28,000	28,000	28,000	28,000
Waxahachie Additional Reuse	3,112	2,963	2,684	2,405	2,125	1,846
UTRWD Indirect Reuse of flows from Lake Ralph Hall		17,760	17,760	17,760	17,760	17,760
Weatherford Indirect Reuse		5,000	5,000	5,000	5,000	5,000
Total	207,549	432,493	517,928	530,837	543,581	557,056

2.4 Projected Return Flows

As part of the 2011 Region H Water Plan, the potential impact of Region C recommended reuse strategies on return flows in the Trinity Basin were evaluated. The projected water demands, return flows and reuse strategies from the upper Trinity Basin were analyzed to determine the level of return flows available to Region H in the lower Trinity Basin.

The 2006 Region C Water Plan estimated the level of projected future return flows estimated based on projected municipal and industrial (M&I) water demands after the implementation of conservation measures. Return flow factors were determined from historical data (69 % for the Metroplex and 50% for other counties). Recommended direct reuse projects were subtracted from the projected return flows to determine the net return flows available to the upper Trinity Basin. *Table 6* presents the summary of projected return flow calculations presented in the Region C 2006 Water Plan. This number represents net return flows across the upper Trinity Basin.

Table 6 Region C 2006 Projected Upper Trinity Basin Return Flows

Values in Acre-feet per Year

	2010	2020	2030	2040	2050	2060
Demands	1,563,725	1,858,601	2,092,965	2,328,370	2,607,058	2,943,509
Conservation	51,370	106,427	148,159	188,500	230,232	277,434
Net Demands	1,512,355	1,752,174	1,944,806	2,139,870	2,376,826	2,666,075
Projected Return Flows	1,022,392	1,181,415	1,307,898	1,437,611	1,595,689	1,789,184
Proposed Reuse	372,112	601,685	724,073	743,867	780,471	796,279
Net Return Flows	650,280	579,730	583,825	693,744	815,218	992,905

Note: Projected Return Flows are based on (M&I) Water Use in the Trinity Basin in Region C.

The return flow analysis presented in the 2006 Region C Regional Water Plan resulted in a minimum net annual return flow estimate of 579,730 acre-ft per year in the 2020 planning decade. However, this estimate was based largely on an assumed return flow factor of 69% from water demands in the Metroplex. The 69% return flow factor was assumed from the TCEQ WAM Run 8 model and may not accurately reflect the return flow estimates during drought conditions. In December 2008, the draft Region C Water Conservation and Reuse Study was prepared by the Region C consultant team. As part of the study, projected return flows were re-analyzed using a reduced return flow factor reflecting severe drought conditions experienced in 2006. The revised return flow estimate assumed a return flow factor of 51% in 2010 and 2020, 52% in 2030 and 2040, and 53% in 2050 and 2060. The reduced return flow factors presented in the Region C Conservation and Reuse Study suggest a more consumptive use of existing water supplies than previously estimated. *Table 7* shows the revised return flow estimates based on information presented in the 2008 Draft Region C Water Conservation and Reuse Strategy.

Table 7 Region C 2008 Projected Upper Trinity Basin Return Flows

Values in Acre-feet per Year

	2010	2020	2030	2040	2050	2060
Demands	1,563,725	1,858,601	2,092,965	2,328,370	2,607,058	2,943,509
Conservation	51,370	106,427	148,159	188,500	230,232	277,434
Net Demands	1,512,355	1,752,174	1,944,806	2,139,870	2,376,826	2,666,075
Projected Return Flows	765,662	896,882	1,004,341	1,115,359	1,247,968	1,404,851
Proposed Reuse	350,476	613,996	751,286	781,515	817,876	832,360
Net Return Flows	415,185	282,886	253,055	333,844	430,092	572,491

Note: Projected Return Flows are based on M&I Water Use in the Trinity Basin in Region C.

As can be seen in *Table 7*, the projected return flows are reduced significantly from previous estimates as a result of the revised return flow factors. The minimum annual return flow estimated in the 2008 draft Region C report is 253,055 acre-ft per year in the year 2030. This estimate represents an almost 50% reduction from the previously estimated minimum annual return flow of 579,730 acre-ft per year in the year 2020.

Region C projected demands and reuse strategies downloaded from DB07 were analyzed assuming a reduced return flow factor of 50% in lieu of 69% as assumed in the Region C 2006 Plan. As can be seen in *Table 8*, the resulting net in-basin return flows are consistent with the results of the 2008 Region C Conservation and Reuse Study. There are some discrepancies. The total demands for Municipal and Manufacturing (M&I) WUGS in the Trinity Basin inside of Region C were higher in DB07 than shown in the 2008 Region C Water Conservation and Reuse Study. The WUG demands from DB07 were sorted by region and by basin to only include the WUGs located within the Trinity Basin and Region C. This may include several WUGs located in the Trinity Basin that discharge wastewater outside of the Trinity Basin.

Table 8 DB07 Return Flow Analysis

Values in Acre-feet per Year

	2010	2020	2030	2040	2050	2060
Demands	1,596,099	1,923,710	2,188,421	2,453,800	2,757,833	3,114,920
Conservation	52,095	110,803	154,475	196,101	238,662	286,681
Net Demands	1,544,004	1,812,907	2,033,946	2,257,699	2,519,171	2,828,239
Return Flows	772,002	906,454	1,016,973	1,128,850	1,259,586	1,414,120
Proposed Reuse	381,657	627,507	761,415	774,472	812,259	826,588
Net Return Flows	390,345	278,947	255,558	354,378	447,327	587,532

Note: Projected Return Flows are based on M&I Water Use in the Trinity Basin in Region C.

2.5 Simulated Return Flows

The projected return flows available to Region H were analyzed at the Oakwood Gage location marking the boundary between Region C and Region H. To model the projected return flows, several models were obtained from the Region C consultant to accurately model the net in-basin return flows associated with projected upper basin demands and projected strategies. The models were developed by the Region C Consultant team for the decades 2010, 2020, 2040 and 2060 to analyze projected return flows at the Oakwood gage. The results of the revised return flow projections were summarized in the 2008 Region C Conservation and Reuse Study. After performing a desktop analysis of Region C WUG demands and proposed reuse strategies downloaded from DB07, it was decided to adopt the return flow estimates projected in the 2008 Region C Water Conservation and Reuse Study for the analysis. The return flows projected in 2008 by the Region C consultant presents the most conservative estimation of future return flows with a minimum annual in-basin return flow of approximately 253,000 acre-ft per year in 2030. In March 2009, the Region H consultant team received the future condition WAM Models from the Region C consultants for use in evaluating the impacts projected return flows on water availability in Region H, specifically the yield of Lake Livingston.

The Water Rights Analysis Package (WRAP) WAM Run 3 was updated to include the projected Region C reuse strategies and in-basin return flows. The models were then used to quantify the return flows available to Region H. The return flows available to region H during the drought of record were quantified as the increase in regulated flow above the WAM Run3 baseline conditions. *Figure 2-1* and *Table 9* illustrate that not all of the net in-basin return flows projected in Region C will be available to Region H. The return flows will also be available to other water right holders for diversion and impoundment in upstream reservoirs.

Figure 2-1 Minimum Annual Return Flows at Oakwood Gage

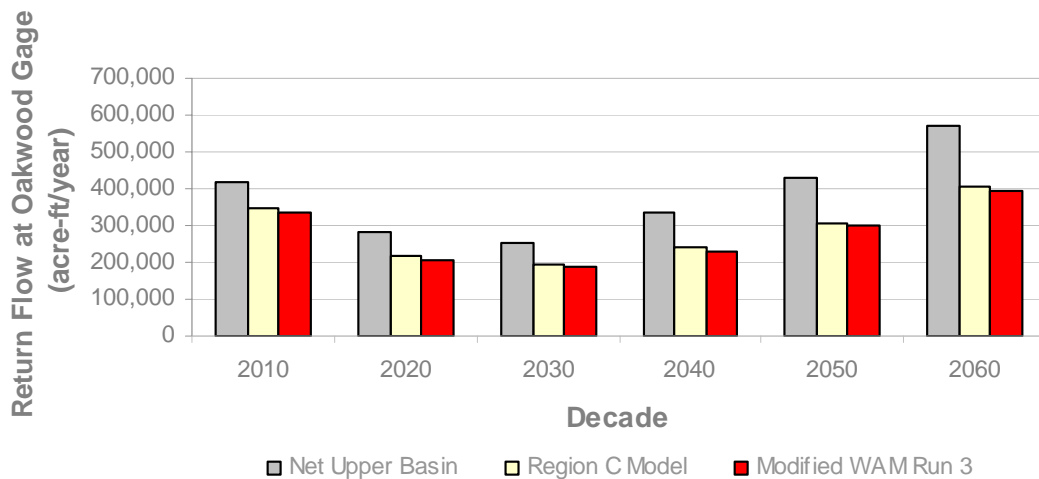


Table 9 Return Flows at Oakwood Gage

Values in Acre-feet per Year

Return Flows	2010	2020	2030	2040	2050	2060
Net Upper Basin	415,185	282,886	253,055	333,844	430,092	572,491
at Oakwood Gage	333,966	208,601	185,502	227,847	299,417	393,808
% of Net Upper Basin Return Flows	80.4%	73.7%	73.3%	68.2%	69.6%	68.8%

Section 3 – Methodology

Two sets of models were created and executed to evaluate the firm yield of the Lake Livingston water rights. The first set of models was updated to include the projected upper basin return flows from Region C for each decade as modeled for the Region C Water Conservation and Reuse Study. These models were used to evaluate the firm yield of Lake Livingston in each decade. The second set of models was updated to quantify the minimum level of return flows necessary to firm up the Lake Livingston water rights. Return flows were iteratively added to these models until the full permitted yield of the reservoir was firm during drought of record conditions. The models were executed to evaluate the firm yield of Lake Livingston with projected return flows from Region C and to determine the minimum level of return flows required in each planning decade. The results were also compared to quantify the excess or shortage of return flows projected in each planning decade.

3.1 Trinity River WAM Firm Yield Analysis

The firm yield of the Lake Livingston water rights was evaluated using a modified version of the TCEQ WAM Run3. The WAM Run 3 presents the most conservative set of assumptions when evaluating water right availability by assuming full authorized diversions and complete consumption (no return flows) unless otherwise specified within the water rights permit. To simulate actual projected conditions, the model was revised to include anticipated return flows and planned reuse identified in the Region C 2008 Water Conservation and Reuse Study. The model was also revised to include future storage area vs storage volume (SA/SV) curves to account for the effects of projected sedimentation on reservoir yields. The year 2000 SA/SV records were inserted into the model to simulate the 2010 scenario. Decade 2030 SA/SV records were inserted to model the decades 2020, 2030, and 2040. Model simulations for decades 2050 and 2060 assumed the year 2060 sedimentation condition. Table 10 lists the WAM Run 3 models and assumptions utilized in the analysis.

“Planning groups should analyze existing surface water supplies based on firm yield for both reservoirs and surface water diversions. For reservoirs, firm yield is the maximum amount of water a reservoir can provide in a given year during drought of record conditions using reasonable sedimentation rates, and under the assumption that senior water rights holders have their full allotments of water.” General Guidelines for Regional Water Plan Development (2007 – 2012), March 2008.

**Table 10 Lake Livingston Firm Yield Models
with Anticipated Return Flows and Planned Reuse**

Model	Net Upper Basin Return Flows (acre ft/year)	Lake Livingston SA/SV Curve
TR_RUN3FY_2010.dat	415,815	Year 2000
TR_RUN3FY_2020.dat	282,886	Year 2030
TR_RUN3FY_2030.dat	253,055	Year 2030
TR_RUN3FY_2040.dat	333,844	Year 2030
TR_RUN3FY_2050.dat	430,092	Year 2060
TR_RUN3FY_2060.dat	572,491	Year 2060

3.2 Trinity River WAM Iterative Firm Yield Analysis

The effects of return flows on the firm yield of the Lake Livingston water rights were simulated by iteratively adjusting the magnitude of return flow available at the boundary between Region C and Region H. Return flows from the upper basin were modeled with a Constant Inflow (CI) record inserted at control point (CP) 8TROA, located at the boundary of Region H and Region C. The CI record assumed a constant monthly distribution. The annual volume of the assumed return flows was increased until the full permitted yield of the Lake Livingston water rights was available during the drought of record.

As discussed in *Section 3.1*, the storage area capacity curve for Lake Livingston was updated to account for the effects of projected sedimentation in future decades. The year 2000 SA/SV records were inserted into the model to simulate the 2010 scenario. Decade 2030 SA/SV records were inserted to model the decades 2020, 2030, and 2040. Model simulations for decades 2050 and 2060 assumed the year 2060 sedimentation condition. *Table 11* lists the WAM Run 3 models and assumptions utilized in the analysis.

Table 11 Lake Livingston Firm Yield

Model	Net Upper Basin Return Flows (acre ft/year)	Lake Livingston SA/SV Curve
TR_8TROA_2010.dat	280,000	Year 2000
TR_8TROA_2020.dat	280,000	Year 2030
TR_8TROA_2030.dat	280,000	Year 2030
TR_8TROA_2040.dat	280,000	Year 2030
TR_8TROA_2050.dat	285,000	Year 2060
TR_8TROA_2060.dat	285,000	Year 2060

Section 4 – Evaluation of Projected Return Flow on Lake Livingston

The impacts of projected upper basin return flows on the firm yield of Lake Livingston were analyzed for each decade in the planning period. The results are summarized in *Section 4.1*. The necessary level of return flows required to make the Lake Livingston water rights permit achieve 100% reliability was quantified for each decade in the planning period. The results are discussed in *Section 4.2*.

4.1 Lake Livingston Firm Yield

The firm yield of Lake Livingston is reduced in the decades 2020, 2030 and 2040 due to insufficient return flows from the upper Trinity Basin. *Table 12* lists the firm yield of Lake Livingston for each of the planning decades studied. By 2020, increased reuse diversions in Region C are projected to reduce return flows available to Region H and consequently to reduce the firm yield of Lake Livingston during a drought-of-record by 55,000 acre-ft per year. By 2030, projected in-basin return flows are projected to be reduced to 253,055 acre-ft per year, which is the minimum level expected during the planning period. Under these assumed conditions, the firm yield of Lake Livingston in 2030 is projected to be 1,265,000 acre-ft per year, approximately 79,000 acre-ft per year less than the currently permitted diversion under the existing water rights permit.

Return flows in the upper Trinity Basin are expected to increase from the year 2030 through 2060. In 2040 the firm yield of Lake Livingston is projected to increase to 1,294,000 acre-ft per year. The increase in firm yield is due to increased demands in the upper basin that will require the importation of additional out-of-basin supplies. By 2050, the firm yield of Lake Livingston is projected to be equal to the full permitted diversion. *Table 12* shows the projected firm yield of the Lake Livingston water rights under these assumed conditions.

Table 12 Lake Livingston Firm Yield (acre-ft per year)

Return Flows	2010	2020	2030	2040	2050	2060
Firm Yield	1,344,000	1,289,000	1,265,000	1,294,000	1,344,000	1,344,000
Reduction in Yield	0	-55,000	-79,000	-50,000	0	0

4.2 Necessary Level of Return Flows

The level of return flows required to achieve 100% reliability during the drought-of-record for the permitted diversion of the Lake Livingston water rights was determined by an iterative analysis. Return flows were artificially added to the TCEQ WAM Run 3 model and the analysis was performed for each decade in the planning period.

The results of the analysis are shown graphically in *Figure 4-1* by recording Lake Livingston storage volumes at the end of each month during the simulation. The baseline model shown in gray illustrates the storage volume of Lake Livingston assuming no return flows from the upper Trinity Basin. As can be seen from the graph, the firm yield of Lake Livingston is dependant on return flows. By adding return flows into the model, Lake Livingston is able to impound additional water during the drought of record. In *Figure 4-1* the additional water impounded in the Lake is represented by increasing storage volumes. As return flows are increased, the minimum lake levels between April 1956 and April 1957 are decreased until the permitted diversion is met during the drought of record.

Figure 4-2 compares the results of the iterative return flow analysis with the return flows projected at the Oakwood Gage for each decade in the planning period. The figure shows that a minimum of 280,000 acre-ft per year is required from 2010 to 2040 to achieve 100% reliability for the Lake Livingston water rights. This minimum required level of return flow increases in 2050 and 2060 to 285,000 acre-ft per year to offset reduced storage from sedimentation. The figure shows that in 2010 a sufficient volume of return flow is available to “firm up” the Lake Livingston permitted diversions. In the decades 2020, 2030, and 2040, however, the projected return flows are insufficient to maintain the full yield of the water rights. In 2050 and 2060, return flow levels are projected to increase to levels that will support the full permitted diversion of the Lake Livingston water rights.

Figure 4-1 Lake Livingston Storage

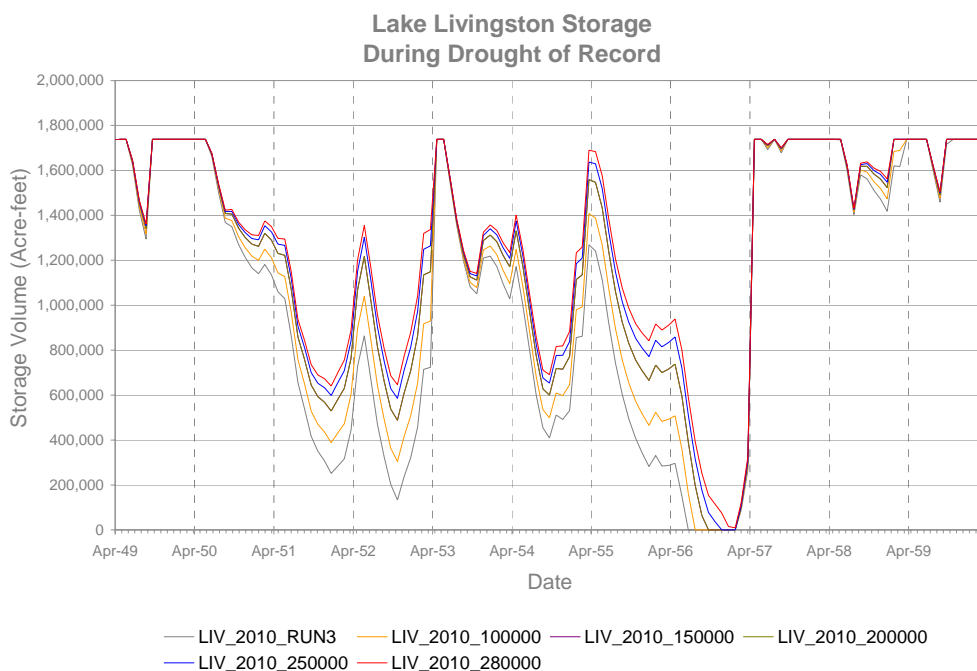
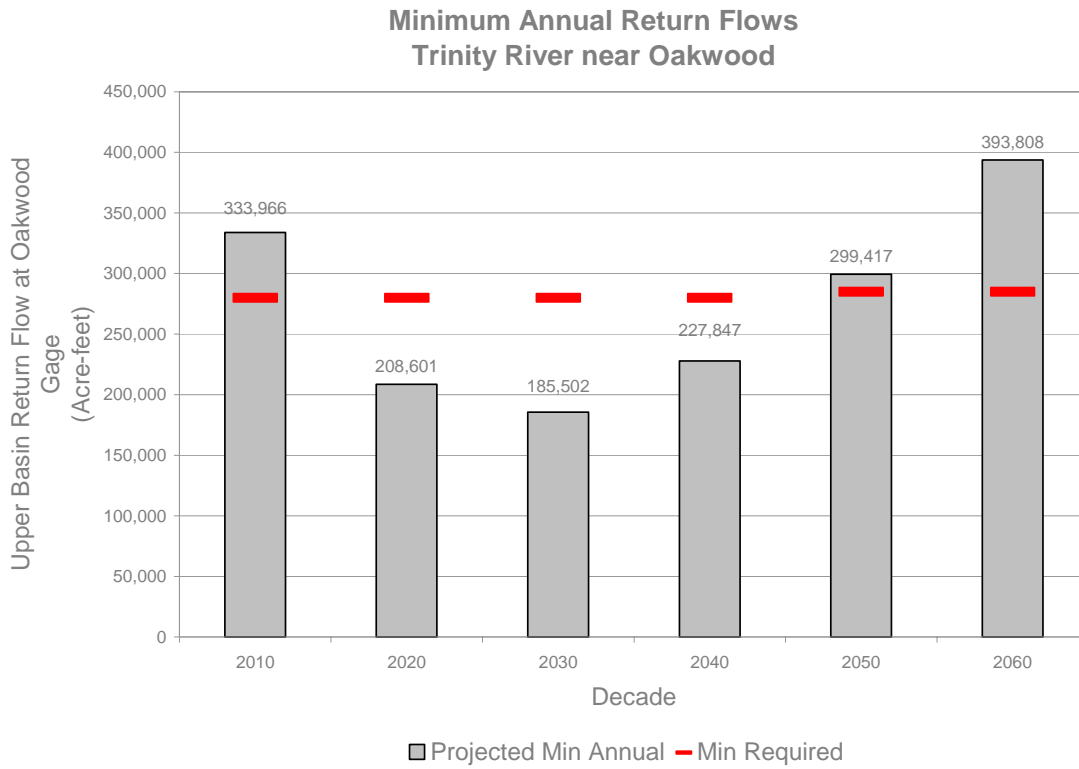


Figure 4-2 Minimum Annual Flows at Oakwood



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Section 5 – Findings and Conclusions

5.1 Summary of Findings

The results of this study consider conservative assumptions regarding the availability of return flows from Region C including full projected reuse and more consumptive use of existing and future water supplies. The reduction in projected return flows available to Region H are the result of a revision to the return flow factors used to estimate the amount of water returned in the upper Trinity Basin. The lower return flow factor indicates that demands in the upper basin are more consumptive than previously estimated, producing less net return flow to the basin. More consumptive use of water supplies in the upper Trinity Basin will reduce the amount of return flows available to Region H and will reduce the reliability of surface water rights in the lower Trinity Basin. The study shows that the firm yield of the Lake Livingston water rights may be temporarily reduced during the 2020, 2030 and 2040 decades as a result of these conservative return flow estimates from the upper Trinity Basin. By the year 2050 however, the projected return flows should be sufficient to maintain the full permitted diversion of the Lake Livingston water rights during the drought-of-record.

The firm yield of the Lake Livingston water rights was estimated for every decade in the planning period to evaluate the impacts of projected return flows from the upper Trinity Basin. The following statements describe whether sufficient return flows will be available to make the permitted yield of the Lake Livingston water rights 100% reliable during drought-of-record conditions. If sufficient return flows are not projected to be present, the reduction in the firm yield is listed.

- Sufficient return flows will be present in 2010.
- The firm yield of Lake Livingston will be reduced by 55,000 acre-ft per year in 2020.
- The firm yield of Lake Livingston will be reduced by 79,000 acre-ft per year in 2030.
- The firm yield of Lake Livingston will be reduced by 50,000 acre-ft per year in 2040.
- Sufficient return flows will be present in 2050.
- Sufficient return flows will be present in 2060.

The minimum level of return flows required to make the permitted yield of the Lake Livingston water rights 100% reliable during drought-of-record is approximately:

- 280,000 acre-ft per year required in 2010 – 2040 to maintain permitted diversions.
- 280,500 acre-ft per year required in 2050 and 2060.

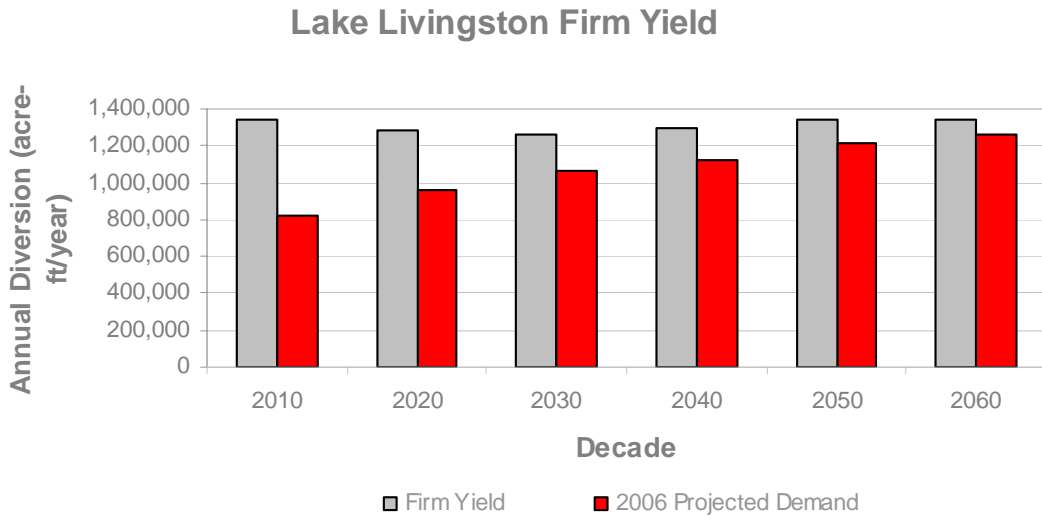
5.2 Impacts on Recommended Region H Strategies

The 2006 Region H Water Plan recommended several water management strategies that relied on utilizing water supplies from Lake Livingston. During the decades 2020, 2030, and 2040, the firm yield of the Lake Livingston water rights is projected to be reduced which could possibly impact these proposed water management strategies. Although the firm yield of the Lake Livingston water rights is projected to be reduced, sufficient supplies are projected to be available in Lake Livingston resulting in no impact to the water management strategies proposed in the 2006 Region H Plan. The firm yield of the Lake Livingston water rights and the Region H demands projected to be supplied by the source are summarized below in *Table 13* and illustrated in *Figure 5-1*.

Table 13 Lake Livingston Firm Yield vs Projected Demands (acre-ft per year)

	2010	2020	2030	2040	2050	2060
Firm Yield	1,344,000	1,289,000	1,265,000	1,294,000	1,344,000	1,344,000
Projected Demands	820,020	966,102	1,068,845	1,120,753	1,215,812	1,258,245
Surplus	523,980	322,898	196,155	173,247	128,188	85,755

Figure 5-1 Lake Livingston Firm Yield vs Projected Demands



Appendix A

DB07 – Region C Municipal Demands in Trinity Basin

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Appendix A
DB07 – Region C Municipal Demands in Trinity Basin

WUG ID	WUG Name	WUG County Name	WUG Basin Name	TWD2010	TWD2020	TWD2030	TWD2040	TWD2050	TWD2060
034001000	ABLE SPRINGS WSC	KAUFMAN	TRINITY	539	841	1,069	1,321	1,634	2,022
030673000	ADDISON	DALLAS	TRINITY	8,932	10,235	11,145	11,778	12,220	12,528
030674000	ALEDO	PARKER	TRINITY	454	622	793	943	1,105	1,284
030008000	ALLEN	COLLIN	TRINITY	24,150	29,603	34,845	36,584	37,321	37,632
030810000	ALVORD	WISE	TRINITY	178	196	215	233	253	277
030813000	ANNA	COLLIN	TRINITY	1,317	2,688	4,033	5,377	7,169	11,201
030814000	ANNETTA	PARKER	TRINITY	203	254	295	330	368	409
030997000	ANNETTA SOUTH	PARKER	TRINITY	91	108	121	132	145	158
030677000	ARGYLE	DENTON	TRINITY	2,380	4,011	5,035	5,562	6,144	6,721
034007000	ARGYLE WSC	DENTON	TRINITY	862	863	863	863	863	863
030025000	ARLINGTON	TARRANT	TRINITY	81,692	95,026	101,591	104,733	106,828	107,875
030028000	ATHENS	HENDERSON	TRINITY	2,737	3,276	3,930	4,724	5,678	6,822
030758000	AUBREY	DENTON	TRINITY	481	903	1,471	1,977	2,657	3,571
030816000	AURORA	WISE	TRINITY	142	168	193	218	246	279
030031000	AZLE	PARKER	TRINITY	366	466	580	678	781	895
030031000	AZLE	TARRANT	TRINITY	1,655	2,337	3,338	4,506	5,675	6,676
030033000	BALCH SPRINGS	DALLAS	TRINITY	2,716	2,907	3,072	3,216	3,340	3,448
030999000	BARDWELL	ELLIS	TRINITY	108	138	168	199	234	271
030820000	BARTONVILLE	DENTON	TRINITY	1,008	2,240	3,136	3,696	3,921	4,033
034010000	BARTONVILLE WSC	DENTON	TRINITY	317	363	404	441	474	503
030044000	BEDFORD	TARRANT	TRINITY	10,418	10,916	11,336	11,688	11,984	12,233
030051000	BENBROOK	TARRANT	TRINITY	4,963	5,909	7,091	8,509	10,163	12,054
034016000	BETHEL-AASH WSC	HENDERSON	TRINITY	175	213	252	291	339	399
034017000	BETHESDA WSC	TARRANT	TRINITY	1,589	1,968	2,358	2,769	3,262	3,846
034024000	BLACKLAND WSC	ROCKWALL	TRINITY	151	223	273	328	392	467
030828000	BLOOMING GROVE	NAVARRO	TRINITY	152	152	152	152	152	152
030062000	BLUE MOUND	TARRANT	TRINITY	308	322	322	322	322	322
030829000	BLUE RIDGE	COLLIN	TRINITY	314	672	1,176	1,848	2,688	3,024
034028000	BOLIVAR WSC	COOKE	TRINITY	215	260	311	312	312	312
034028000	BOLIVAR WSC	DENTON	TRINITY	928	1,301	3,024	6,721	10,921	14,786
034028000	BOLIVAR WSC	WISE	TRINITY	196	254	329	482	670	1,005
030760000	BOYD	WISE	TRINITY	222	296	325	325	325	325
034029000	BRANDON-IRENE WSC	ELLIS	TRINITY	10	11	13	14	15	17
034029000	BRANDON-IRENE WSC	NAVARRO	TRINITY	28	30	32	35	38	42
030076000	BRIDGEPORT	WISE	TRINITY	1,616	1,983	2,850	3,395	3,956	4,734
034040000	BUENA VISTA - BETHEL SUD	ELLIS	TRINITY	569	702	769	875	1,006	1,159
030087000	BURLESON	TARRANT	TRINITY	821	1,045	1,275	1,518	1,810	2,154
034041000	CADDO BASIN SUD	COLLIN	TRINITY	192	239	298	358	420	487
030098000	CARROLLTON	DALLAS	TRINITY	11,087	11,197	11,373	11,487	11,603	11,724
030098000	CARROLLTON	DENTON	TRINITY	15,478	16,027	16,839	17,344	17,696	17,871
030102000	CEDAR HILL	DALLAS	TRINITY	8,229	10,521	12,445	14,061	15,416	16,554
030102000	CEDAR HILL	ELLIS	TRINITY	9	9	9	9	9	9

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WUG ID	WUG Name	WUG County Name	WUG Basin Name	TWD2010	TWD2020	TWD2030	TWD2040	TWD2050	TWD2060
030103000	CELINA	COLLIN	TRINITY	1,008	5,080	10,753	19,042	29,124	33,604
034049000	CHATFIELD WSC	NAVARRO	TRINITY	562	864	1,055	1,262	1,509	1,813
030842000	CHICO	WISE	TRINITY	216	249	298	365	448	547
030121000	COCKRELL HILL	DALLAS	TRINITY	670	720	732	738	741	742
034065000	COLLEGE MOUND WSC	KAUFMAN	TRINITY	944	1,461	2,013	2,381	2,837	3,403
030125000	COLLEYVILLE	TARRANT	TRINITY	8,799	9,697	10,063	10,213	10,275	10,299
030765000	COLLINSVILLE	GRAYSON	TRINITY	335	467	599	730	862	994
030766000	COMBINE	DALLAS	TRINITY	104	135	150	166	186	212
030766000	COMBINE	KAUFMAN	TRINITY	191	247	297	352	420	504
034066000	COMBINE WSC	DALLAS	TRINITY	164	237	271	305	360	409
034066000	COMBINE WSC	KAUFMAN	TRINITY	321	502	656	828	1,040	1,303
034068000	COMMUNITY WATER COMPANY	ELLIS	TRINITY	121	182	218	254	295	340
034068000	COMMUNITY WATER COMPANY	NAVARRO	TRINITY	111	168	209	262	327	409
034069000	COMMUNITY WSC	TARRANT	TRINITY	437	444	451	458	467	477
034069000	COMMUNITY WSC	WISE	TRINITY	18	18	18	18	19	19
030133000	COPELL	DALLAS	TRINITY	10,171	10,171	10,171	10,171	10,171	10,171
030133000	COPELL	DENTON	TRINITY	106	147	182	212	237	258
030849000	COPPER CANYON	DENTON	TRINITY	404	560	840	1,246	1,456	1,568
030691000	CORINTH	DENTON	TRINITY	3,824	4,800	5,548	6,304	6,754	7,092
030137000	CORSICANA	NAVARRO	TRINITY	5,950	6,215	6,491	6,790	7,148	7,587
030757043	COUNTY-OTHER	COLLIN	TRINITY	827	772	723	673	620	564
030757049	COUNTY-OTHER	COOKE	TRINITY	870	1,022	1,057	1,063	1,063	1,063
030757057	COUNTY-OTHER	DALLAS	TRINITY	190	147	114	88	69	53
030757061	COUNTY-OTHER	DENTON	TRINITY	7,412	9,402	11,320	13,096	14,825	16,605
030757070	COUNTY-OTHER	ELLIS	TRINITY	2,039	2,039	2,039	2,039	2,039	2,039
030757074	COUNTY-OTHER	FANNIN	TRINITY	182	181	178	173	168	161
030757081	COUNTY-OTHER	FREESTONE	TRINITY	1,078	1,127	1,152	1,159	1,159	1,159
030757091	COUNTY-OTHER	GRAYSON	TRINITY	451	449	443	421	388	347
030757107	COUNTY-OTHER	HENDERSON	TRINITY	268	268	267	267	267	267
030757119	COUNTY-OTHER	JACK	TRINITY	386	451	515	580	644	708
030757129	COUNTY-OTHER	KAUFMAN	TRINITY	1,837	1,837	1,837	1,837	1,837	1,837
030757175	COUNTY-OTHER	NAVARRO	TRINITY	256	256	256	256	256	256
030757184	COUNTY-OTHER	PARKER	TRINITY	2,576	2,319	2,061	1,803	1,546	1,288
030757199	COUNTY-OTHER	ROCKWALL	TRINITY	140	140	140	140	140	140
030757220	COUNTY-OTHER	TARRANT	TRINITY	3,535	3,535	3,535	3,535	3,535	3,535
030757249	COUNTY-OTHER	WISE	TRINITY	3,988	4,626	4,626	4,626	4,626	4,626
030767000	GRANDALL	KAUFMAN	TRINITY	759	1,063	1,351	1,669	2,064	2,553
031011000	GROSS ROADS	DENTON	TRINITY	588	1,310	2,134	3,560	5,545	6,922
030145000	CROWLEY	TARRANT	TRINITY	1,421	1,737	2,211	3,001	3,633	3,949
034083000	CULLEOKA WSC	COLLIN	TRINITY	956	1,451	1,762	2,082	2,416	2,771

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WUG ID	WUG Name	WUG County Name	WUG Basin Name	TWD2010	TWD2020	TWD2030	TWD2040	TWD2050	TWD2060
030151000	DALLAS	COLLIN	TRINITY	16,969	18,364	20,148	20,851	21,268	21,876
030151000	DALLAS	DALLAS	TRINITY	370,552	410,015	430,705	451,783	501,451	589,420
030151000	DALLAS	DENTON	TRINITY	7,900	8,492	8,787	8,934	9,007	9,043
030151000	DALLAS	ROCKWALL	TRINITY	6	6	6	6	6	6
034085000	DALLAS COUNTY WCID #6	DALLAS	TRINITY	609	829	959	1,089	1,258	1,483
030692000	DALWORTHINGTON GARDENS	TARRANT	TRINITY	782	840	878	903	920	930
034086000	DANVILLE WSC	COLLIN	TRINITY	870	1,203	1,497	1,798	2,114	2,450
030855000	DAWSON	NAVARRO	TRINITY	180	193	205	219	236	256
030161000	DE SOTO	DALLAS	TRINITY	10,942	13,465	15,490	17,379	19,506	20,089
030153000	DECATUR	WISE	TRINITY	1,669	2,087	2,879	3,742	4,845	5,697
030159000	DENTON	DENTON	TRINITY	30,698	42,130	52,927	62,454	76,974	105,533
034089000	DENTON COUNTY FWSD	DENTON	TRINITY	1,008	1,614	2,184	2,771	3,367	3,990
030768000	DOUBLE OAK	DENTON	TRINITY	690	764	813	863	912	961
030171000	DUNCANVILLE	DALLAS	TRINITY	8,104	8,529	8,734	8,930	9,116	9,293
034094000	EAST CEDAR CREEK FWSD	HENDERSON	TRINITY	2,381	2,987	3,586	4,200	4,949	5,894
034096000	EAST FORK SUD	COLLIN	TRINITY	577	751	904	1,062	1,226	1,401
034096000	EAST FORK SUD	DALLAS	TRINITY	120	126	130	134	139	145
034096000	EAST FORK SUD	ROCKWALL	TRINITY	9	9	9	9	9	9
030180000	EDGECLIFF	TARRANT	TRINITY	471	471	471	471	471	471
030192000	ENNIS	ELLIS	TRINITY	3,589	4,594	5,881	7,528	9,637	12,336
030193000	EULESS	TARRANT	TRINITY	9,998	11,302	11,945	12,262	12,418	12,496
030864000	EUSTACE	HENDERSON	TRINITY	153	169	184	200	219	243
030194000	EVERMAN	TARRANT	TRINITY	837	915	992	1,069	1,146	1,159
030196000	FAIRFIELD	FREESTONE	TRINITY	1,143	1,257	1,371	1,485	1,600	1,714
030772000	FAIRVIEW	COLLIN	TRINITY	1,752	2,353	3,038	4,557	7,595	13,291
030198000	FARMERS BRANCH	DALLAS	TRINITY	11,366	12,369	13,282	14,112	14,866	15,552
030199000	FARMERSVILLE	COLLIN	TRINITY	586	1,113	1,591	2,386	3,499	4,772
030201000	FERRIS	ELLIS	TRINITY	341	341	341	341	341	341
034112000	FILES VALLEY WSC	ELLIS	TRINITY	145	158	171	184	199	216
034114000	FLO COMMUNITY WSC	FREESTONE	TRINITY	21	22	23	23	23	23
030204000	FLOWER MOUND	DENTON	TRINITY	17,205	22,851	26,883	30,916	33,335	34,972
030206000	FOREST HILL	TARRANT	TRINITY	1,847	2,015	2,187	2,369	2,576	2,705
030207000	FORNEY	KAUFMAN	TRINITY	2,016	4,301	5,377	6,273	6,990	7,671
034115000	FORNEY LAKE WSC	KAUFMAN	TRINITY	2,285	2,464	2,576	2,688	2,800	2,912
034115000	FORNEY LAKE WSC	ROCKWALL	TRINITY	1,792	2,464	2,576	2,688	2,800	2,912
030213000	FORT WORTH	DENTON	TRINITY	1,204	7,225	10,837	15,654	22,879	30,104
030213000	FORT WORTH	PARKER	TRINITY	2,890	12,523	19,266	22,156	25,287	27,696
030213000	FORT WORTH	TARRANT	TRINITY	147,856	167,210	196,093	239,362	301,825	380,214
030213000	FORT WORTH	WISE	TRINITY	482	2,408	3,372	4,335	5,780	7,225

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WUG ID	WUG Name	WUG County Name	WUG Basin Name	TWD2010	TWD2020	TWD2030	TWD2040	TWD2050	TWD2060
030221000	FRISCO	COLLIN	TRINITY	30,244	48,726	52,423	56,119	59,816	62,000
030221000	FRISCO	DENTON	TRINITY	15,833	18,482	29,572	34,276	37,637	38,813
030868000	FROST	NAVARRO	TRINITY	89	96	103	110	118	129
030225000	GAINESVILLE	COOKE	TRINITY	3,811	4,149	4,610	5,020	5,430	5,942
030230000	GARLAND	DALLAS	TRINITY	44,227	47,987	51,186	54,009	56,455	56,455
034137000	GASTONIA-SCURRY	KAUFMAN	TRINITY	896	1,288	1,500	1,819	2,214	2,703
030697000	GLENN HEIGHTS	DALLAS	TRINITY	944	1,149	1,338	1,514	1,676	1,827
030697000	GLENN HEIGHTS	ELLIS	TRINITY	343	469	593	720	862	1,018
030245000	GRAND PRAIRIE	DALLAS	TRINITY	23,802	28,400	33,327	39,604	46,881	54,371
030245000	GRAND PRAIRIE	ELLIS	TRINITY	77	361	903	1,517	2,242	3,164
030245000	GRAND PRAIRIE	TARRANT	TRINITY	6,282	7,732	8,675	9,288	9,686	9,945
030249000	GRAPEVINE	TARRANT	TRINITY	13,805	16,249	17,590	18,552	19,244	19,740
030699000	GUN BARREL CITY	HENDERSON	TRINITY	1,284	1,508	1,729	1,956	2,232	2,581
030676000	GUNTER	GRAYSON	TRINITY	417	694	833	972	1,111	1,250
034146000	GUNTER RURAL WSC	COLLIN	TRINITY	580	773	909	1,092	1,284	1,489
034146000	GUNTER RURAL WSC	GRAYSON	TRINITY	103	155	206	283	451	644
031023000	HACKBERRY	DENTON	TRINITY	147	219	287	320	336	343
030261000	HALTOM CITY	TARRANT	TRINITY	7,336	8,230	8,677	8,901	9,013	9,069
030879000	HASLET	TARRANT	TRINITY	428	856	1,498	1,498	1,498	1,498
030702000	HEATH	ROCKWALL	TRINITY	1,796	2,650	3,323	4,048	4,903	5,906
030776000	HEBRON	DENTON	TRINITY	224	349	582	1,165	1,747	1,887
030704000	HICKORY CREEK	DENTON	TRINITY	557	891	1,092	1,344	1,764	2,268
034203000	HICKORY CREEK SUD	COLLIN	TRINITY	12	16	20	24	27	32
034203000	HICKORY CREEK SUD	FANNIN	TRINITY	13	15	16	16	17	18
034205000	HIGH POINT WSC	KAUFMAN	TRINITY	533	771	932	1,111	1,333	1,608
034205000	HIGH POINT WSC	ROCKWALL	TRINITY	51	82	102	124	149	179
030276000	HIGHLAND PARK	DALLAS	TRINITY	4,285	4,327	4,366	4,402	4,434	4,465
030706000	HIGHLAND VILLAGE	DENTON	TRINITY	3,478	3,873	4,102	4,234	4,310	4,363
030286000	HOWE	GRAYSON	TRINITY	502	840	1,143	1,344	1,512	1,680
030883000	HUDSON OAKS	PARKER	TRINITY	381	549	731	894	1,073	1,273
030293000	HURST	TARRANT	TRINITY	7,742	8,219	8,542	8,759	8,906	9,006
030294000	HUTCHINS	DALLAS	TRINITY	1,255	2,509	4,015	6,022	8,029	8,531
030298000	IRVING	DALLAS	TRINITY	56,483	61,857	65,916	68,982	71,296	73,044
030299000	ITALY	ELLIS	TRINITY	293	352	397	443	494	551
030302000	JACKSBORO	JACK	TRINITY	703	726	741	741	741	741
034216000	JOHNSON COUNTY RURAL SUD	ELLIS	TRINITY	43	57	73	91	110	129
034216000	JOHNSON COUNTY RURAL SUD	TARRANT	TRINITY	429	554	689	847	1,033	1,221
031031000	JOSEPHINE	COLLIN	TRINITY	103	302	302	302	302	302

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WUG ID	WUG Name	WUG County Name	WUG Basin Name	TWD2010	TWD2020	TWD2030	TWD2040	TWD2050	TWD2060
030784000	JUSTIN	DENTON	TRINITY	516	903	1,457	2,395	2,924	3,226
030313000	KAUFMAN	KAUFMAN	TRINITY	1,202	1,825	2,188	2,479	2,770	3,341
030315000	KELLER	TARRANT	TRINITY	9,341	11,152	11,152	11,152	11,152	11,152
030711000	KEMP	KAUFMAN	TRINITY	185	185	185	185	185	185
030318000	KENNEDALE	TARRANT	TRINITY	1,388	1,675	1,869	2,001	2,089	2,149
030712000	KERENS	NAVARRO	TRINITY	405	405	405	405	405	405
034223000	KIOWA HOMEOWNERS WSC	COOKE	TRINITY	514	551	571	574	573	573
030892000	KRUGERVILLE	DENTON	TRINITY	171	196	228	296	386	554
030785000	KRUM	DENTON	TRINITY	495	708	877	1,176	1,512	1,932
030337000	LAKE DALLAS	DENTON	TRINITY	1,257	1,529	1,669	1,765	1,832	1,878
030341000	LAKE WORTH	TARRANT	TRINITY	952	1,059	1,176	1,294	1,411	1,470
031036000	LAKESIDE	TARRANT	TRINITY	454	527	601	679	773	884
030345000	LANCASTER	DALLAS	TRINITY	7,953	12,725	15,906	19,087	21,632	23,223
034230000	LAVON WSC	COLLIN	TRINITY	383	616	902	1,803	2,834	3,864
034230000	LAVON WSC	ROCKWALL	TRINITY	348	616	804	1,007	1,245	1,525
030352000	LEONARD	FANNIN	TRINITY	308	358	499	785	1,142	1,427
030355000	LEWISVILLE	DALLAS	TRINITY	1	1	1	1	1	1
030355000	LEWISVILLE	DENTON	TRINITY	21,309	26,697	30,647	33,332	35,285	37,301
031018000	LINCOLN PARK	DENTON	TRINITY	138	208	264	322	381	442
030899000	LINDSAY	COOKE	TRINITY	157	168	174	175	175	175
030790000	LITTLE ELM	DENTON	TRINITY	5,565	8,513	10,104	10,104	10,104	10,104
031039000	LOG CABIN	HENDERSON	TRINITY	99	135	155	155	155	155
031041000	LOWRY CROSSING	COLLIN	TRINITY	322	413	494	576	663	743
030718000	LUCAS	COLLIN	TRINITY	1,075	1,655	2,016	2,604	3,696	5,041
034239000	LUELLA WSC	GRAYSON	TRINITY	506	569	613	638	654	690
034241000	M E N WSC	NAVARRO	TRINITY	456	501	551	597	635	690
030375000	MABANK	HENDERSON	TRINITY	76	82	87	93	99	108
030375000	MABANK	KAUFMAN	TRINITY	530	647	767	900	1,065	1,270
030383000	MALAKOFF	HENDERSON	TRINITY	431	457	483	509	542	582
030384000	MANSFIELD	ELLIS	TRINITY	124	278	484	755	1,116	1,589
030384000	MANSFIELD	TARRANT	TRINITY	13,442	19,603	25,203	30,804	34,164	34,164
030911000	MAYPEARL	ELLIS	TRINITY	147	147	147	147	147	147
030379000	MCKINNEY	COLLIN	TRINITY	25,134	41,231	60,241	81,835	97,595	112,014
031042000	MCLENDON-CHISHOLM	ROCKWALL	TRINITY	204	265	317	373	440	518
030914000	MELISSA	COLLIN	TRINITY	2,420	4,481	5,825	7,169	8,961	11,201
030401000	MESQUITE	DALLAS	TRINITY	29,572	36,041	41,585	44,727	46,021	46,317
030401000	MESQUITE	KAUFMAN	TRINITY	-	1	1	1	1	2

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WUG ID	WUG Name	WUG County Name	WUG Basin Name	TWD2010	TWD2020	TWD2030	TWD2040	TWD2050	TWD2060
030405000	MIDLOTHIAN	ELLIS	TRINITY	2,925	4,667	6,904	8,416	9,767	10,788
030916000	MILFORD	ELLIS	TRINITY	88	88	88	88	88	88
034257000	MILLIGAN WSC	COLLIN	TRINITY	209	209	209	209	209	209
034269000	MOUNTAIN PEAK WSC	ELLIS	TRINITY	1,244	1,396	1,481	1,710	2,102	2,609
034270000	MT ZION WSC	ROCKWALL	TRINITY	447	658	737	816	895	921
030418000	MUENSTER	COOKE	TRINITY	385	446	493	547	608	669
030724000	MURPHY	COLLIN	TRINITY	1,596	6,066	6,066	6,066	6,066	6,066
034271000	MUSTANG WSC	DENTON	TRINITY	958	1,552	2,041	2,544	3,055	3,590
034413000	NAVARRO MILLS WSC	NAVARRO	TRINITY	360	517	647	808	1,010	1,263
031045000	NEVADA	COLLIN	TRINITY	71	182	218	437	728	1,820
031047000	NEW FAIRVIEW	WISE	TRINITY	204	279	352	424	505	600
030923000	NEW HOPE	COLLIN	TRINITY	272	395	659	988	1,482	3,293
030920000	NEWARK	WISE	TRINITY	160	250	330	466	629	877
034278000	NORTH COLLIN WSC	COLLIN	TRINITY	904	1,167	1,399	1,638	1,887	2,153
030435000	NORTH RICHLAND HILLS	TARRANT	TRINITY	12,787	14,491	15,642	16,419	16,945	17,300
031020000	NORTHLAKE	DENTON	TRINITY	808	967	1,858	2,750	3,307	3,561
030928000	OAK GROVE	KAUFMAN	TRINITY	130	160	190	224	266	318
030929000	OAK LEAF	ELLIS	TRINITY	347	409	471	534	605	683
030930000	OAK POINT	DENTON	TRINITY	527	873	1,142	1,420	1,702	1,997
030729000	OVILLA	DALLAS	TRINITY	77	114	167	245	359	526
030729000	OVILLA	ELLIS	TRINITY	1,049	1,407	1,759	1,968	1,968	1,968
030731000	PALMER	ELLIS	TRINITY	248	266	283	301	322	344
030454000	PANTEGO	TARRANT	TRINITY	657	657	657	657	657	657
030733000	PARKER	COLLIN	TRINITY	1,943	4,237	6,219	10,106	14,770	20,212
030934000	PAYNE SPRINGS	HENDERSON	TRINITY	169	181	193	205	219	237
030935000	PECAN HILL	ELLIS	TRINITY	164	190	216	243	272	305
030795000	PELLICAN BAY	TARRANT	TRINITY	164	217	277	306	341	382
030465000	PILOT POINT	DENTON	TRINITY	1,255	1,764	2,016	2,233	2,369	2,520
030472000	PLANO	COLLIN	TRINITY	72,283	74,938	77,848	80,746	83,643	86,541
030472000	PLANO	DENTON	TRINITY	1,578	2,220	2,243	2,257	2,272	2,286
031021000	PONDER	DENTON	TRINITY	643	1,787	3,573	5,717	6,611	6,789
030487000	PRINCETON	COLLIN	TRINITY	700	1,680	3,024	5,041	8,401	12,602
030799000	PROSPER	COLLIN	TRINITY	2,061	7,561	10,921	12,322	13,162	14,002
030799000	PROSPER	DENTON	TRINITY	515	2,240	3,921	5,881	6,441	7,001
034313000	R-C-H WSC	ROCKWALL	TRINITY	420	462	499	538	584	638
030737000	RED OAK	ELLIS	TRINITY	1,143	1,463	1,745	2,034	2,357	2,713
030739000	RENO	PARKER	TRINITY	331	345	356	366	376	387
030946000	RHOMME	WISE	TRINITY	603	1,184	1,694	2,166	2,585	3,099
030947000	RICE	NAVARRO	TRINITY	233	274	317	364	420	488

Appendix A
DB07 – Region C Municipal Demands in Trinity Basin

WUG ID	WUG Name	WUG County Name	WUG Basin Name	TWD2010	TWD2020	TWD2030	TWD2040	TWD2050	TWD2060
034409000	RICE WSC	ELLIS	TRINITY	132	177	222	267	318	374
034409000	RICE WSC	NAVARRO	TRINITY	855	1,077	1,307	1,557	1,855	2,222
030498000	RICHARDSON	COLLIN	TRINITY	7,023	10,854	10,854	10,854	10,854	10,854
030498000	RICHARDSON	DALLAS	TRINITY	25,820	26,178	26,178	26,178	26,178	26,178
030499000	RICHLAND HILLS	TARRANT	TRINITY	1,355	1,452	1,548	1,661	1,726	1,750
030505000	RIVER OAKS	TARRANT	TRINITY	1,042	1,042	1,042	1,042	1,042	1,042
030800000	ROANOKE	DENTON	TRINITY	1,209	1,960	3,080	4,201	5,601	6,747
034325000	ROCKETT SUD	DALLAS	TRINITY	340	426	477	528	594	683
034325000	ROCKETT SUD	ELLIS	TRINITY	4,161	5,119	5,607	6,370	7,323	8,430
030513000	ROCKWALL	ROCKWALL	TRINITY	8,603	15,402	19,883	22,403	22,995	22,995
030521000	ROWLETT	DALLAS	TRINITY	10,997	14,152	16,238	17,925	19,291	20,397
030521000	ROWLETT	ROCKWALL	TRINITY	1,617	1,722	1,725	1,725	1,725	1,725
031059000	RUNAWAY BAY	WISE	TRINITY	329	405	478	550	632	726
030742000	SACHSE	COLLIN	TRINITY	741	1,212	1,404	1,485	1,520	1,546
030742000	SACHSE	DALLAS	TRINITY	2,350	2,953	3,446	3,894	4,301	4,670
030527000	SAGINAW	TARRANT	TRINITY	2,956	3,692	4,162	4,505	4,755	4,938
031072000	SAINT PAUL	COLLIN	TRINITY	198	496	991	1,586	1,884	1,983
030535000	SANGER	DENTON	TRINITY	2,333	2,950	3,518	4,195	4,704	4,901
030539000	SANSOM PARK VILLAGE	TARRANT	TRINITY	623	644	661	673	683	691
034330000	SARDIS-LONE ELM WSC	DALLAS	TRINITY	8	8	8	8	8	8
034330000	SARDIS-LONE ELM WSC	ELLIS	TRINITY	1,718	1,770	1,782	1,982	2,366	2,869
030547000	SEAGOVILLE	DALLAS	TRINITY	2,574	2,961	3,295	3,656	3,938	4,241
030547000	SEAGOVILLE	KAUFMAN	TRINITY	3	4	6	7	10	12
030959000	SEVEN POINTS	HENDERSON	TRINITY	181	217	252	288	333	389
030803000	SHADY SHORES	DENTON	TRINITY	320	464	566	671	777	888
034336000	SOUTH GRAYSON WSC	COLLIN	TRINITY	220	227	235	238	242	246
034336000	SOUTH GRAYSON WSC	GRAYSON	TRINITY	176	279	367	470	587	734
030570000	SOUTHLAKE	DENTON	TRINITY	336	672	1,008	1,344	1,949	2,016
030570000	SOUTHLAKE	TARRANT	TRINITY	11,620	13,960	15,168	15,792	16,114	16,280
034341000	SOUTHWEST FANNIN COUNTY SUD	FANNIN	TRINITY	5	8	9	10	10	11
030574000	SPRINGTOWN	PARKER	TRINITY	521	694	868	1,042	1,215	1,389
030749000	SUNNYVALE	DALLAS	TRINITY	1,815	2,540	3,266	3,992	4,718	4,827
031065000	TALTY	KAUFMAN	TRINITY	866	1,356	1,860	2,419	3,111	3,968
030596000	TEAGUE	FREESTONE	TRINITY	338	459	507	561	611	662
030599000	TERRELL	KAUFMAN	TRINITY	3,643	4,469	5,193	5,669	6,136	6,819
030752000	THE COLONY	DENTON	TRINITY	5,513	7,214	8,115	8,373	8,631	8,708
030974000	TIOGA	GRAYSON	TRINITY	196	445	623	712	784	819
030976000	TOM BEAN	GRAYSON	TRINITY	268	304	345	365	385	406
030753000	TOOL	HENDERSON	TRINITY	419	479	538	598	671	764

Appendix A
DB07 – Region C Municipal Demands in Trinity Basin

WUG ID	WUG Name	WUG County Name	WUG Basin Name	TWD2010	TWD2020	TWD2030	TWD2040	TWD2050	TWD2060
030978000	TRENTON	FANNIN	TRINITY	209	314	524	838	1,257	1,676
030609000	TRINIDAD	HENDERSON	TRINITY	188	182	196	200	205	211
030806000	TROPHY CLUB	DENTON	TRINITY	2,737	3,086	3,386	3,646	3,927	4,207
034367000	TWO WAY SUD	GRAYSON	TRINITY	207	301	368	438	509	579
030615000	UNIVERSITY PARK	DALLAS	TRINITY	7,394	7,565	7,687	7,776	7,840	7,886
030981000	VALLEY VIEW	COOKE	TRINITY	193	386	644	902	1,546	1,932
030619000	VAN ALSTYNE	GRAYSON	TRINITY	1,011	2,464	3,360	3,808	4,145	4,301
034371000	VIRGINIA HILL WSC	HENDERSON	TRINITY	403	405	407	409	412	415
034373000	WALNUT CREEK SUD	PARKER	TRINITY	2,128	2,753	3,258	3,695	4,160	4,669
034373000	WALNUT CREEK SUD	WISE	TRINITY	261	335	407	479	559	653
030632000	WATAUGA	TARRANT	TRINITY	3,542	3,725	3,871	3,987	4,080	4,154
030633000	WAXAHACHIE	ELLIS	TRINITY	6,589	8,435	10,797	13,821	17,693	22,648
030634000	WEATHERFORD	PARKER	TRINITY	5,108	6,464	7,696	8,690	9,757	10,952
034381000	WEST CEDAR CREEK MUD	HENDERSON	TRINITY	1,352	1,926	2,386	2,767	3,233	3,821
034381000	WEST CEDAR CREEK MUD	KAUFMAN	TRINITY	955	1,598	2,200	2,787	3,513	4,414
034391000	WEST WISE RURAL SUD	WISE	TRINITY	517	572	625	677	736	805
031069000	WESTON	COLLIN	TRINITY	269	717	1,568	4,481	7,841	13,442
031070000	WESTOVER HILLS	TARRANT	TRINITY	279	279	279	279	279	279
030644000	WESTWORTH VILLAGE	TARRANT	TRINITY	252	306	325	348	374	412
030651000	WHITE SETTLEMENT	TARRANT	TRINITY	2,584	2,780	3,026	3,107	3,353	3,598
030650000	WHITESBORO	GRAYSON	TRINITY	458	482	499	508	514	521
030756000	WILLOW PARK	PARKER	TRINITY	648	806	986	1,139	1,300	1,475
030657000	WILMER	DALLAS	TRINITY	678	966	1,134	1,353	1,803	2,834
034403000	WOODBINE WSC	COOKE	TRINITY	661	729	798	866	934	1,003
034403000	WOODBINE WSC	GRAYSON	TRINITY	13	14	14	14	14	14
030668000	WORTHAM	FREESTONE	TRINITY	251	262	268	270	270	270
030669000	WYLLIE	COLLIN	TRINITY	6,804	10,782	13,442	18,818	19,715	21,544
030669000	WYLLIE	DALLAS	TRINITY	117	185	235	279	319	355
030669000	WYLLIE	ROCKWALL	TRINITY	136	234	306	383	474	504
Total				1,531,395	1,850,570	2,107,253	2,364,829	2,662,105	3,015,265

Appendix B

DB07 – Region C Industrial Demands in Trinity Basin

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Appendix B
DB07 – Region C Industrial Demands in Trinity Basin

WUG ID	WUG Name	WUG County Name	WUG Basin Name	TWD2010	TWD2020	TWD2030	TWD2040	TWD2050	TWD2060
031001043	MANUFACTURING	COLLIN	TRINITY	3,607	4,137	4,654	5,170	5,633	6,115
031001049	MANUFACTURING	COOKE	TRINITY	273	306	335	364	389	421
031001057	MANUFACTURING	DALLAS	TRINITY	34,115	37,791	41,148	44,214	46,703	46,983
031001061	MANUFACTURING	DENTON	TRINITY	1,068	1,239	1,408	1,579	1,731	1,880
031001070	MANUFACTURING	ELLIS	TRINITY	3,466	3,670	3,841	3,987	4,089	3,912
031001091	MANUFACTURING	GRAYSON	TRINITY	2	2	2	2	2	2
031001107	MANUFACTURING	HENDERSON	TRINITY	110	118	133	151	172	195
031001129	MANUFACTURING	KAUFMAN	TRINITY	760	813	869	928	993	1,061
031001175	MANUFACTURING	NAVARRO	TRINITY	1,172	1,328	1,468	1,607	1,730	1,872
031001184	MANUFACTURING	PARKER	TRINITY	548	618	685	751	809	878
031001199	MANUFACTURING	ROCKWALL	TRINITY	12	14	16	17	19	21
031001220	MANUFACTURING	TARRANT	TRINITY	17,258	20,444	23,630	26,924	29,919	32,457
031001249	MANUFACTURING	WISE	TRINITY	2,313	2,660	2,979	3,277	3,539	3,858
Total				64,704	73,140	81,168	88,971	95,728	99,655

Appendix C

DB07 – Region C Conservation Supply in Trinity Basin

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WMS Project ID	Project Name	SRC Name	WUG ID	WUG Name	WUG County Name	WUG Basf	SS2010	SS2020	SS2030	SS2040	SS2050	SS2060
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03100104	MANUFACTURING	COLLIN	TRINITY	-	6	72	108	119	130
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03100104	MANUFACTURING	COOKE	TRINITY	-	1	7	10	11	12
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03100105	MANUFACTURING	DALLAS	TRINITY	-	68	781	1,135	1,212	1,258
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03100106	MANUFACTURING	DENTON	TRINITY	-	2	29	44	49	53
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03100110	MANUFACTURING	HENDERSON	TRINITY	-	-	3	4	5	5
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03100112	MANUFACTURING	KAUFMAN	TRINITY	-	1	15	22	23	25
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03100117	MANUFACTURING	NAVARRO	TRINITY	-	1	16	23	25	27
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03100118	MANUFACTURING	PARKER	TRINITY	-	-	4	6	7	7
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03100119	MANUFACTURING	ROCKWALL	TRINITY	-	-	-	-	1	1
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03100122	MANUFACTURING	TARRANT	TRINITY	-	35	413	630	711	784
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03100124	MANUFACTURING	WISE	TRINITY	-	1	12	18	19	21
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03100124	MANUFACTURING	COLLIN	TRINITY	316	242	20	-	-	-
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03015100	DALLAS	COLLIN	TRINITY	6,891	5,235	437	-	-	-
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03015100	DALLAS	DALLAS	TRINITY	147	108	9	-	-	-
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03015100	DALLAS	DENTON	TRINITY	708	1,430	1,960	2,346	2,694	3,019
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03000900	ALLEN	COLLIN	TRINITY	43	141	243	366	543	936
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03081300	ANNA	COLLIN	TRINITY	5	25	48	80	125	150
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03082900	BLUE RIDGE	COLLIN	TRINITY	4	13	17	22	28	34
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03404100	CADDO BASIN SUD	COLLIN	TRINITY	31	259	630	1,263	2,157	2,750
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03010300	CELINA	COLLIN	TRINITY	14	41	41	40	38	36
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03075704	COUNTY-OTHER	COLLIN	TRINITY	21	80	102	126	154	185
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03408300	CULLEOKA WSC	COLLIN	TRINITY	435	782	986	1,149	1,318	1,407
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03015100	DALLAS	COLLIN	TRINITY	30	76	106	141	182	231
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03408600	DANVILLE WSC	COLLIN	TRINITY	10	36	47	58	71	86
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03409600	EAST FORK SUD	COLLIN	TRINITY	48	105	160	275	520	1,017
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03077200	FAIRVIEW	COLLIN	TRINITY	6	38	59	96	151	221
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03019900	FARMERSVILLE	COLLIN	TRINITY	1,319	4,345	5,104	5,924	6,805	7,561
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03022100	FRISCO	COLLIN	TRINITY	12	43	53	67	82	100
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03414600	GUNTER RURAL WSC	COLLIN	TRINITY	-	1	1	2	2	3
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03420300	HICKORY CREEK SUD	COLLIN	TRINITY	1	13	14	15	16	16
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03103100	JOSEPHINE	COLLIN	TRINITY	8	34	52	110	182	260
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03423000	AVON WSC	COLLIN	TRINITY	10	23	31	40	51	214
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03104100	LOWRY CROSSING	COLLIN	TRINITY	37	64	84	116	175	254
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03071800	LUCAS	COLLIN	TRINITY	931	2,996	4,851	7,228	9,407	11,700
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03037900	MCKINNEY	COLLIN	TRINITY	87	240	357	497	693	986
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03091400	MELISSA	COLLIN	TRINITY	3	11	12	13	13	14
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03425700	MILLIGAN WSC	COLLIN	TRINITY	11	25	31	38	47	57
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03041800	MUENSTER	COOKE	TRINITY	51	337	384	431	479	527
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03072400	MURPHY	COLLIN	TRINITY	2	8	12	26	50	139
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03104500	NEVADA	COLLIN	TRINITY	7	19	36	62	105	259
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03092300	NEW HOPE	COLLIN	TRINITY	31	76	102	131	166	206
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03427800	NORTH COLLIN WSC	COLLIN	TRINITY	55	186	322	604	1,000	1,530
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03073300	PARKER	COLLIN	TRINITY	1,937	3,439	4,180	4,970	5,800	6,692
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03047200	PLANO	COLLIN	TRINITY	9	55	108	194	350	563
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03048700	PRINCETON	COLLIN	TRINITY	64	373	626	806	966	1,140
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03079900	PROSPER	COLLIN	TRINITY	185	474	561	643	726	812
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03049800	RICHARDSON	COLLIN	TRINITY	22	65	87	103	117	132
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03074200	SACHSE	COLLIN	TRINITY	6	28	63	113	149	172
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03107200	SAINT PAUL	COLLIN	TRINITY	4	11	12	13	14	15
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03433600	SOUTH GRAYSON WSC	COLLIN	TRINITY	5	41	92	299	584	1,108
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03106900	WESTON	COLLIN	TRINITY	281	877	1,196	1,816	2,059	2,420
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03066900	WYLIE	COLLIN	TRINITY	3	12	14	15	16	17
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03402800	BOLIVAR WSC	COOKE	TRINITY	12	46	51	55	58	61
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03075704	COUNTY-OTHER	COOKE	TRINITY	111	222	282	342	411	496
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03022500	GAINESVILLE	COOKE	TRINITY	6	21	24	26	28	29
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03422300	KIOWA HOMEOWNERS WSC	COOKE	TRINITY	5	10	12	13	14	16
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03089900	LINDSAY	COOKE	TRINITY	3	17	31	46	83	110
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03098100	VALLEY VIEW	COOKE	TRINITY	9	33	39	44	50	57
C01CONSMFG	MANUFACTURING CONSERVATION	CONSERVATION	03440300	WOODBINE WSC	COOKE	TRINITY	-	-	-	-	-	-

WMS Project ID	Project Name	SRC Name	WUG ID	WUG Name	DWGS County Name	WUG Basin	SS2010	SS2020	SS2030	SS2040	SS2050	SS2060
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030673004	ADDISON	DALLAS	TRINITY	213	345	465	587	707	826
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030033004	BALCH SPRINGS	DALLAS	TRINITY	32	119	134	149	164	180
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030098004	CARROLLTON	DALLAS	TRINITY	304	548	643	734	829	929
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030102004	CEDAR HILL	DALLAS	TRINITY	693	2,256	2,751	3,181	3,608	4,002
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030121004	COCKRELL HILL	DALLAS	TRINITY	7	26	29	31	33	36
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030766004	COMBINE	DALLAS	TRINITY	2	6	8	9	10	13
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030466004	COMBINE WSC	DALLAS	TRINITY	3	11	13	16	19	23
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030133004	COPELL	DALLAS	TRINITY	283	507	586	665	745	826
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030757051	COUNTY-OTHER	DALLAS	TRINITY	2	7	6	5	4	3
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030151004	DALLAS	DALLAS	TRINITY	9,491	16,910	21,067	24,888	31,078	37,898
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034085004	DALLAS COUNTY WCID #6	DALLAS	TRINITY	10	38	47	56	69	86
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030161004	DE SOTO	DALLAS	TRINITY	309	668	886	1,127	1,413	1,613
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030171004	DUNCANVILLE	DALLAS	TRINITY	226	439	513	588	668	753
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030409604	EAST FORK SUD	DALLAS	TRINITY	2	6	7	7	8	9
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030198004	FARMERS BRANCH	DALLAS	TRINITY	295	525	667	819	980	1,149
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030230004	GARLAND	DALLAS	TRINITY	1,251	2,533	3,083	3,646	4,229	4,663
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030697004	GLENN HEIGHTS	DALLAS	TRINITY	15	55	68	81	94	109
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030245004	GRAND PRAIRIE	DALLAS	TRINITY	710	1,552	2,067	2,752	3,603	4,597
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030276004	HIGHLAND PARK	DALLAS	TRINITY	24	73	87	102	117	132
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030294004	HUTCHINS	DALLAS	TRINITY	37	126	232	394	589	692
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030289004	IRVING	DALLAS	TRINITY	1,452	2,563	3,229	3,900	4,577	5,263
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030345004	LANCASTER	DALLAS	TRINITY	100	429	583	756	921	1,059
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030401004	MESQUITE	DALLAS	TRINITY	869	1,949	2,548	3,075	3,504	3,882
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030729004	OVILLA	DALLAS	TRINITY	2	6	11	18	29	46
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030498004	RICHARDSON	DALLAS	TRINITY	678	1,144	1,353	1,552	1,751	1,960
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034325004	ROCKETT SUD	DALLAS	TRINITY	5	18	22	26	31	37
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030621004	ROWLETT	DALLAS	TRINITY	328	764	1,001	1,243	1,485	1,732
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030742004	SACHSE	DALLAS	TRINITY	71	159	212	269	332	397
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034330004	SARDIS-LOME ELM WSC	DALLAS	TRINITY	-	-	-	1	1	1
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030647004	SEAGOVILLE	DALLAS	TRINITY	30	100	121	145	168	193
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030749004	SUNNYVALE	DALLAS	TRINITY	50	115	173	243	325	371
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030615004	UNIVERSITY PARK	DALLAS	TRINITY	49	154	180	206	232	259
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030657004	WILMER	DALLAS	TRINITY	10	39	49	62	88	147
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030669004	WYLE	DALLAS	TRINITY	5	15	21	27	33	40
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030677004	ARGYLE	DENTON	TRINITY	69	187	275	347	433	528
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034007004	ARGYLE WSC	DENTON	TRINITY	26	52	58	64	71	78
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030758004	AUBREY	DENTON	TRINITY	8	52	95	88	126	181
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030827004	BARTONVILLE	DENTON	TRINITY	34	125	199	263	310	360
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034010004	BARTONVILLE WSC	DENTON	TRINITY	3	19	25	30	36	42
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034028004	BOLIVAR WSC	DENTON	TRINITY	15	61	134	318	550	790
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030098004	CARROLLTON	DENTON	TRINITY	425	784	952	1,109	1,265	1,417
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030133004	COPELL	DENTON	TRINITY	3	7	10	14	17	21
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030849004	COPEPER CANYON	DENTON	TRINITY	11	28	38	48	53	61
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030691004	CORINTH	DENTON	TRINITY	116	263	348	445	531	615
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030101004	CROSS ROADS	DENTON	TRINITY	94	336	439	548	668	800
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030110004	CROSS ROADS	DENTON	TRINITY	16	58	112	216	380	530
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030151004	DALLAS	DENTON	TRINITY	202	350	430	482	558	651
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030159004	DENTON	DENTON	TRINITY	847	1,912	2,796	3,773	5,247	8,073
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034089004	DENTON COUNTY FWSD	DENTON	TRINITY	30	81	127	184	251	330
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030768004	DOUBLE OAK	DENTON	TRINITY	20	39	48	58	68	79
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030204004	FLOWER MOUND	DENTON	TRINITY	490	1,159	1,573	2,051	2,479	2,882
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030213004	FORT WORTH	DENTON	TRINITY	33	345	601	985	1,614	2,359
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030221004	FRISCO	DENTON	TRINITY	690	1,648	2,879	3,618	4,281	4,733
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	031023004	HACKBERRY	DENTON	TRINITY	3	10	14	17	19	20
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030776004	HEBBRON	DENTON	TRINITY	6	18	35	78	130	155
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030704004	HICKORY CREEK	DENTON	TRINITY	8	33	44	58	82	112
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030706004	HIGHLAND VILLAGE	DENTON	TRINITY	102	208	282	291	329	367
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030784004	JUSTIN	DENTON	TRINITY	16	48	89	165	224	272

WMS Project ID	Project Name	SRC Name	WUG ID	WUG Name	WUG County Name	WUG Basf	SS2010	SS2020	SS2030	SS2040	SS2050	SS2060
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03089200	KRUSERVILLE	DENTON	TRINITY	3	9	12	16	22	33
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03078500	KRUM	DENTON	TRINITY	7	40	36	52	71	97
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03033700	LAKE DALLAS	DENTON	TRINITY	15	82	102	122	140	158
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03035500	LEWISVILLE	DENTON	TRINITY	601	1,306	1,737	2,146	2,540	2,979
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03101800	LINCOLN PARK	DENTON	TRINITY	2	12	11	14	18	22
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03079000	LITTLE ELM	DENTON	TRINITY	190	475	643	725	806	888
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03427100	MUSTANG WSC	DENTON	TRINITY	18	72	101	134	170	211
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03102000	NORTH LAKE	DENTON	TRINITY	29	59	128	212	281	332
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03093000	OAK POINT	DENTON	TRINITY	8	50	74	103	137	177
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03046500	PILOT POINT	DENTON	TRINITY	18	94	123	90	103	117
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03047200	PLANO	DENTON	TRINITY	42	102	120	139	158	177
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03102100	PONDER	DENTON	TRINITY	18	78	184	340	446	512
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03079900	PROSPER	DENTON	TRINITY	16	110	225	384	473	570
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03080000	ROANOKE	DENTON	TRINITY	34	91	168	261	393	527
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03063500	SANGER	DENTON	TRINITY	75	162	220	294	366	419
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03080300	SHADY SHORES	DENTON	TRINITY	4	26	23	29	36	44
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03057000	SOUTH LAKE	DENTON	TRINITY	9	32	56	85	139	161
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03075200	THE COLONY	DENTON	TRINITY	90	341	407	444	482	511
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03080600	TROPHY CLUB	DENTON	TRINITY	74	142	182	225	274	328
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03098900	BARDWELL	ELLIS	TRINITY	2	7	9	11	13	16
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03402900	BANDON/RENE WSC	ELLIS	TRINITY	-	1	1	1	1	1
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03404000	BUENA VISTA - BETHEL SUD	ELLIS	TRINITY	17	40	49	62	79	100
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03010200	CEDAR HILL	ELLIS	TRINITY	1	2	2	2	2	2
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03406800	COMMUNITY WATER COMPANY	ELLIS	TRINITY	2	8	11	13	16	20
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03075707	COUNTY-OTHER	ELLIS	TRINITY	19	68	74	81	87	93
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03019200	ENNIS	ELLIS	TRINITY	110	266	384	546	770	1,079
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03020100	FERRIS	ELLIS	TRINITY	3	12	13	14	15	16
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03411200	FILES VALLEY WSC	ELLIS	TRINITY	1	5	6	7	8	9
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03069700	GLENN HEIGHTS	ELLIS	TRINITY	5	22	30	39	49	60
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03024500	GRAND PRAIRIE	ELLIS	TRINITY	2	20	56	105	172	267
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03029900	ITALY	ELLIS	TRINITY	4	16	20	23	27	32
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03421600	JOHNSON COUNTY RURAL SUD	ELLIS	TRINITY	-	2	3	3	4	5
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03038400	MANSFIELD	ELLIS	TRINITY	4	14	28	49	82	130
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03091100	MAYPEARL	ELLIS	TRINITY	4	9	10	11	12	13
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03040900	MIDLOTHIAN	ELLIS	TRINITY	89	248	421	577	747	910
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03091600	MILFORD	ELLIS	TRINITY	1	4	4	5	5	5
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03426900	MOUNTAIN PEAK WSC	ELLIS	TRINITY	148	443	479	560	705	896
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03082900	OAK LEAF	ELLIS	TRINITY	10	22	29	37	47	58
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03072900	OVILLA	ELLIS	TRINITY	33	80	113	141	157	173
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03073100	PALMER	ELLIS	TRINITY	3	13	14	16	18	20
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03093500	PECAN HILL	ELLIS	TRINITY	5	10	13	17	21	26
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03073700	RED OAK	ELLIS	TRINITY	33	76	104	137	176	224
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03440900	RICE WSC	ELLIS	TRINITY	2	8	11	14	17	21
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03432500	ROCKETT SUD	ELLIS	TRINITY	58	221	258	312	380	463
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03433000	SARDIS-LONE ELM WSC	ELLIS	TRINITY	51	96	111	137	181	242
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03063300	WAXAHACHIE	ELLIS	TRINITY	229	580	823	1,155	1,612	2,241
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03075707	COUNTY-OTHER	FANNIN	TRINITY	2	8	9	9	9	9
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03420300	HICKORY CREEK SUD	FANNIN	TRINITY	-	1	1	1	2	2
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03035200	LEONARD	FANNIN	TRINITY	4	15	22	36	57	75
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03434100	SOUTHWEST FANNIN COUNTY SUD	FANNIN	TRINITY	-	-	-	-	1	1
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03097800	TRENTON	FANNIN	TRINITY	22	88	148	240	388	503
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03075708	COUNTY-OTHER	FREESTONE	TRINITY	14	49	53	57	60	63
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03019600	FAIRFIELD	FREESTONE	TRINITY	34	65	81	98	118	139
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03411400	FLO COMMUNITY WSC	FREESTONE	TRINITY	-	2	2	2	2	2
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03069600	TEAGUE	FREESTONE	TRINITY	4	16	20	23	27	32
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03066800	WORTHAM	FREESTONE	TRINITY	7	14	16	18	20	22
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03097400	TIOGA	GRAYSON	TRINITY	6	27	42	53	64	73
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03076500	COLLINSVILLE	GRAYSON	TRINITY	11	18	25	32	40	49

WMS Project ID	Project Name	SRC Name	WUG ID	WUG Name	WUG County Name	WUG Bas	SS2010	SS2020	SS2030	SS2040	SS2050	SS2060
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030757091	COUNTY-OTHER	GRAYSON	TRINITY	5	20	21	21	21	20
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030876004	GUNTER	GRAYSON	TRINITY	6	26	34	42	51	62
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030414600	GUNTER RURAL WSC	GRAYSON	TRINITY	2	9	12	17	29	43
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030286001	HOWE	GRAYSON	TRINITY	7	45	69	64	65	78
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034239004	LEBELA WSC	GRAYSON	TRINITY	7	26	30	33	36	43
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034336000	SOUTH GRAYSON WSC	GRAYSON	TRINITY	3	14	19	26	34	45
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030876000	TOM BEAN	GRAYSON	TRINITY	23	67	77	84	91	99
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034367000	TWO WAY SUD	GRAYSON	TRINITY	3	14	18	23	28	33
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030619000	VAN ALSTYNE	GRAYSON	TRINITY	31	127	198	254	308	353
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030650000	WHITESBORO	GRAYSON	TRINITY	15	28	32	36	41	45
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034403000	WOODBINE WSC	GRAYSON	TRINITY	-	1	1	1	1	1
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030028000	ATHENS	HENDERSON	TRINITY	24	152	212	288	388	520
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034016000	BETHEL-ASH WSC	HENDERSON	TRINITY	3	14	17	21	25	30
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030757101	COUNTY-OTHER	HENDERSON	TRINITY	2	8	9	10	11	12
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034094000	EAST CEDAR CREEK FWSD	HENDERSON	TRINITY	74	178	241	313	407	531
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030864000	EUSTACE	HENDERSON	TRINITY	5	11	13	16	19	23
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030699000	GUN BARREL CITY	HENDERSON	TRINITY	37	82	106	135	171	218
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	031039000	LOG CABIN	HENDERSON	TRINITY	2	7	8	9	9	10
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030375000	MABANK	HENDERSON	TRINITY	5	14	15	17	19	21
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030383000	MALAKOFF	HENDERSON	TRINITY	4	14	16	18	21	24
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030934000	PAYNE SPRINGS	HENDERSON	TRINITY	5	10	12	14	16	20
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030959000	SEVEN POINTS	HENDERSON	TRINITY	2	10	12	15	18	22
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030753000	TOOL	HENDERSON	TRINITY	5	18	22	26	31	38
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030609000	TRINIDAD	HENDERSON	TRINITY	2	7	8	9	10	11
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034371000	VIRGINIA HILL WSC	HENDERSON	TRINITY	5	19	20	21	22	24
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034381000	WEST CEDAR CREEK MUD	HENDERSON	TRINITY	24	93	118	145	180	224
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030757114	COUNTY-OTHER	JACK	TRINITY	5	20	25	28	34	40
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030302000	JACKSBORO	JACK	TRINITY	7	23	26	28	30	33
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034001000	LEGGE SPRINGS WSC	KAUFMAN	TRINITY	9	38	52	68	89	116
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030465000	COLLEGE MOUND WSC	KAUFMAN	TRINITY	18	75	97	122	153	194
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030768000	COMBINE	KAUFMAN	TRINITY	3	12	15	19	24	30
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034066000	COMBINE WSC	KAUFMAN	TRINITY	5	23	32	42	57	75
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030757128	COUNTY-OTHER	KAUFMAN	TRINITY	24	71	77	83	88	94
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030767000	GRANDALL	KAUFMAN	TRINITY	24	63	90	123	169	228
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030207000	FORNEY	KAUFMAN	TRINITY	67	249	350	455	561	674
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034115000	FORNEY LAKE WSC	KAUFMAN	TRINITY	75	130	156	183	211	242
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034137000	GASTONIA-SCURRY	KAUFMAN	TRINITY	16	59	73	93	120	155
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034205000	HIGH POINT WSC	KAUFMAN	TRINITY	9	35	45	57	72	92
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030313000	KAUFMAN	KAUFMAN	TRINITY	15	97	82	100	120	155
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030711000	KEMP	KAUFMAN	TRINITY	6	12	8	8	9	9
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030375000	MABANK	KAUFMAN	TRINITY	37	110	136	165	203	252
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030928000	OAK GROVE	KAUFMAN	TRINITY	2	7	9	12	15	19
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030547000	SEAGOVILLE	KAUFMAN	TRINITY	-	-	-	-	-	1
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	031065000	TALTY	KAUFMAN	TRINITY	24	59	96	145	213	304
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030699000	TERRELL	KAUFMAN	TRINITY	100	218	292	361	438	539
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034381000	WEST CEDAR CREEK MUD	KAUFMAN	TRINITY	17	78	109	147	195	259
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030828000	BL COMING GROVE	NAVARRO	TRINITY	2	6	6	9	10	12
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034029000	BRANDON-RENE WSC	NAVARRO	TRINITY	1	1	1	2	2	2
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034049000	CHAFFIELD WSC	NAVARRO	TRINITY	10	39	51	65	82	104
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034068000	COMMUNITY WATER COMPANY	NAVARRO	TRINITY	2	8	10	14	18	23
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030137000	CORSICANA	NAVARRO	TRINITY	46	158	184	341	413	497
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030757778	COUNTY-OTHER	NAVARRO	TRINITY	3	11	11	12	13	13
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030855000	DAWSON	NAVARRO	TRINITY	2	6	7	13	15	19
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030868000	FROST	NAVARRO	TRINITY	1	5	5	6	7	8
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030712000	KERENS	NAVARRO	TRINITY	3	11	12	14	15	16
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034241000	M E N WSC	NAVARRO	TRINITY	7	22	26	30	34	39
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034413000	NAVARRO MILLS WSC	NAVARRO	TRINITY	6	23	31	41	54	72
C01CONSBSAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030947000	RISE	NAVARRO	TRINITY	2	8	16	21	28	36

WMS Project ID	Project Name	SRC Name	WUG ID	WUG Name	WUG County Name	WUG Basf	SS2010	SS2020	SS2030	SS2040	SS2050	SS2060
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03440900	RICE WSC	NAVARRO	TRINITY	12	49	63	80	101	128
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03067400	ALEDO	PARKER	TRINITY	15	37	53	71	91	116
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03081400	ANNETTA	PARKER	TRINITY	3	13	16	19	22	26
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03089700	ANNETTA SOUTH	PARKER	TRINITY	1	5	6	7	9	10
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03003100	AZLE	PARKER	TRINITY	18	16	22	27	34	41
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03075184	COUNTY-OTHER	PARKER	TRINITY	29	106	100	93	84	74
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03021300	FORT WORTH	PARKER	TRINITY	79	598	1,068	1,394	1,783	2,170
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03088300	HUDSON OAKS	PARKER	TRINITY	6	26	36	47	60	75
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03073900	RENO	PARKER	TRINITY	4	16	18	19	21	22
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03057400	SPRINGTOWN	PARKER	TRINITY	17	42	58	78	100	125
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03437300	WALNUT CREEK SUD	PARKER	TRINITY	33	125	157	189	226	268
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03063400	WEATHERFORD	PARKER	TRINITY	149	339	461	587	732	906
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03075600	WILLOW PARK	PARKER	TRINITY	20	49	40	50	60	73
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03402400	BLACKLAND WSC	ROCKWALL	TRINITY	2	10	13	16	21	26
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03075719	COUNTY-OTHER	ROCKWALL	TRINITY	1	4	5	5	5	6
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03409600	EAST FORK SUD	ROCKWALL	TRINITY	-	-	-	-	-	1
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03411500	FORNEY LAKE WSC	ROCKWALL	TRINITY	59	130	156	183	211	242
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03070200	HEATH	ROCKWALL	TRINITY	52	131	190	263	358	478
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03420500	HIGH POINT WSC	ROCKWALL	TRINITY	1	4	5	6	8	10
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03423000	LAVON WSC	ROCKWALL	TRINITY	8	34	47	62	80	103
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03104200	MCLENDON-CHISHOLM	ROCKWALL	TRINITY	3	11	14	17	22	27
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03427000	MT ZION WSC	ROCKWALL	TRINITY	13	33	42	53	64	73
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03431300	R-C-H WSC	ROCKWALL	TRINITY	12	26	32	38	46	55
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03051300	ROCKWALL	ROCKWALL	TRINITY	247	737	1,106	1,422	1,643	1,827
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03062100	ROWLETT	ROCKWALL	TRINITY	48	93	106	120	133	146
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03066900	WYLIE	ROCKWALL	TRINITY	6	19	27	37	50	57
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03002500	ARLINGTON	TARRANT	TRINITY	2,252	4,627	5,714	6,662	7,596	8,507
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03003100	AZLE	TARRANT	TRINITY	79	80	124	182	245	309
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03004400	BEDFORD	TARRANT	TRINITY	283	529	632	734	841	953
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03005100	BENBROOK	TARRANT	TRINITY	119	287	398	540	722	950
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03401700	BETHSDA WSC	TARRANT	TRINITY	21	82	106	132	165	207
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03006200	BLUE MOUND	TARRANT	TRINITY	4	15	16	17	18	19
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03012500	COLLEVILLE	TARRANT	TRINITY	243	454	550	639	724	808
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03406900	COMMUNITY WSC	TARRANT	TRINITY	6	21	23	24	26	28
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03075722	COUNTY-OTHER	TARRANT	TRINITY	41	150	161	171	182	192
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03014500	CROWLEY	TARRANT	TRINITY	17	66	90	131	169	195
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03069200	DALWORTHINGTON GARDENS	TARRANT	TRINITY	21	40	49	57	65	73
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03018000	EDGECLIFF	TARRANT	TRINITY	14	28	31	35	38	41
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03019300	EULESS	TARRANT	TRINITY	272	539	655	761	862	963
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03019400	EVERMAN	TARRANT	TRINITY	11	41	47	53	60	65
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03020600	FOREST HILL	TARRANT	TRINITY	23	84	98	113	130	144
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03021300	FORT WORTH	TARRANT	TRINITY	4,067	7,988	10,869	15,061	21,286	29,792
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03024500	GRAND PRAIRIE	TARRANT	TRINITY	187	422	538	645	744	841
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03024900	GRAPEVINE	TARRANT	TRINITY	375	747	944	1,137	1,328	1,518
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03026100	HALTOM CITY	TARRANT	TRINITY	216	265	306	340	371	401
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03087900	HASLET	TARRANT	TRINITY	13	47	94	105	117	128
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03029300	HURST	TARRANT	TRINITY	214	416	494	568	643	719
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03421600	JOHNSON COUNTY RURAL SUD	TARRANT	TRINITY	5	18	24	32	41	52
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03031500	KELLER	TARRANT	TRINITY	279	597	685	770	859	948
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03031800	KENNEDEALE	TARRANT	TRINITY	57	151	181	209	233	256
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03034100	LAKE WORTH	TARRANT	TRINITY	28	59	75	91	110	125
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03103600	LAKESIDE	TARRANT	TRINITY	20	49	61	74	90	110
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03038400	MANSFIELD	TARRANT	TRINITY	396	975	1,451	2,016	2,510	2,784
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03043500	NORTH RICHLAND HILLS	TARRANT	TRINITY	366	758	936	1,102	1,264	1,424
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03045400	PANTEGO	TARRANT	TRINITY	18	32	37	42	47	52
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03079500	PELICAN BAY	TARRANT	TRINITY	3	12	14	16	19	22
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03049900	RICHLAND HILLS	TARRANT	TRINITY	40	49	57	65	73	79
C01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	03060500	RIVER OAKS	TARRANT	TRINITY	12	43	46	49	52	55

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01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030627000	SAGINAW	TARRANT	TRINITY	90	207	265	321	375	428
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030639000	SANSON PARK VILLAGE	TARRANT	TRINITY	8	28	30	33	35	38
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030670000	SOUTHLAKE	TARRANT	TRINITY	328	658	838	1,000	1,152	1,296
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030682000	WATAUGA	TARRANT	TRINITY	42	154	171	187	203	220
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	031070000	WESTOVER HILLS	TARRANT	TRINITY	7	12	14	17	19	21
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030644000	WESTWORTH VILLAGE	TARRANT	TRINITY	4	15	17	19	21	24
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030651000	WHITE SETTLEMENT	TARRANT	TRINITY	142	87	103	115	134	154
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030810000	ALVORD	TRINITY	TRINITY	2	8	9	11	12	14
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030816000	AURORA	TRINITY	TRINITY	2	8	10	12	14	17
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030428000	BOLIVAR WSC	TRINITY	TRINITY	3	12	15	23	34	54
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030760000	BOVD	TRINITY	TRINITY	3	12	14	15	16	17
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030076000	BRIDGEPORT	TRINITY	TRINITY	47	99	164	221	288	382
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030842000	CHICO	TRINITY	TRINITY	7	10	12	16	21	27
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	0304069000	COMMUNITY WSC	TRINITY	TRINITY	-	1	1	1	1	1
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030757248	COUNTY-OTHER	TRINITY	TRINITY	57	209	223	236	250	284
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030153000	DECATUR	TRINITY	TRINITY	47	102	163	240	349	455
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030213000	FORT WORTH	TRINITY	TRINITY	13	115	187	273	408	566
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	031047000	NEW FAIRVIEW	TRINITY	TRINITY	4	15	20	25	32	40
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030920000	NEWARK	TRINITY	TRINITY	2	10	15	22	32	47
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030946000	RHOMIE	TRINITY	TRINITY	19	60	99	144	192	254
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	031059000	RUNAWAY BAY	TRINITY	TRINITY	10	21	29	37	47	60
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034391000	WALNUT CREEK SUD	TRINITY	TRINITY	4	15	20	25	30	37
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034391000	WEST WISE RURAL SUD	TRINITY	TRINITY	6	23	27	32	36	42
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030008000	ALLEN	TRINITY	TRINITY	20	236	517	593	613	621
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030813000	ANNA	TRINITY	TRINITY	1	7	16	24	33	48
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030103000	CELINA	TRINITY	TRINITY	-	2	24	24	33	42
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030103000	DALLAS	TRINITY	TRINITY	5	59	385	526	511	124
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	034086000	DAVILLIE WSC	TRINITY	TRINITY	1	6	10	12	14	16
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030772000	FAIRVIEW	TRINITY	TRINITY	1	6	10	12	14	16
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030221000	FRISCO	TRINITY	TRINITY	2	26	54	83	140	249
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030271000	MCKINNEY	TRINITY	TRINITY	257	1,277	1,764	2,117	2,038	2,119
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030379000	MELISSA	TRINITY	TRINITY	207	978	1,852	2,569	3,098	3,572
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030914000	MUENSTER	TRINITY	TRINITY	1	12	38	58	72	89
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	0300418000	MURPHY	TRINITY	TRINITY	-	1	6	9	10	11
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030724000	NEVADA	TRINITY	TRINITY	2	31	41	42	42	42
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	031045000	NEW HOPE	TRINITY	TRINITY	-	2	2	4	6	12
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030923000	NORTH COLLIN WSC	TRINITY	TRINITY	1	5	8	9	11	12
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	0344278000	NORTH COLLIN WSC	TRINITY	TRINITY	2	24	43	72	107	150
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030733000	PARKER	TRINITY	TRINITY	76	397	458	473	489	507
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030799000	PROSPER	TRINITY	TRINITY	2	38	63	74	81	85
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030498000	RICHARDSON	TRINITY	TRINITY	8	81	109	108	107	107
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030742000	SACHSE	TRINITY	TRINITY	6	23	30	32	33	33
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	031069000	WESTON	TRINITY	TRINITY	1	7	7	8	8	66
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030669000	WYLE	TRINITY	TRINITY	5	75	150	214	228	251
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030225000	GAINESVILLE	TRINITY	TRINITY	3	14	18	19	20	22
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030899000	LINDSAY	TRINITY	TRINITY	-	1	1	1	1	1
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030673000	ADDISON	TRINITY	TRINITY	11	76	109	133	151	15
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030989000	CARROLLTON	TRINITY	TRINITY	11	76	109	110	111	113
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030102000	CEPDA HILL	TRINITY	TRINITY	65	182	233	263	290	313
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030133000	CEPELL	TRINITY	TRINITY	9	94	190	212	210	210
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030151000	DALLAS	TRINITY	TRINITY	109	1,281	8,220	11,390	12,050	12,584
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030161000	DUNCANVILLE	TRINITY	TRINITY	9	57	101	127	141	151
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030171000	DUNCANVILLE	TRINITY	TRINITY	5	29	50	55	57	57
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030198000	FARMERS BRANCH	TRINITY	TRINITY	5	61	254	352	375	387
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030230000	GARLAND	TRINITY	TRINITY	352	971	1,529	1,774	1,852	1,871
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030245000	GRAUD PRAIRIE	TRINITY	TRINITY	17	161	337	423	511	604
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030294000	HITCHINS	TRINITY	TRINITY	-	5	26	48	68	83
01CONSBAS	MUNICIPAL CONSERVATION-BASIC	CONSERVATION	030298000	IRVING	TRINITY	TRINITY	38	368	1,116	1,427	1,482	1,527

WMS Project ID	Project Name	SRC Name	WUG ID	WUG ID	WUG County Name	WUG Basf	SS2010	SS2020	SS2030	SS2040	SS2050	SS2060
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030401000	MESQUITE	DALLAS	TRINITY	229	634	1,113	1,382	1,436	1,455
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030729000	OVILLA	DALLAS	TRINITY	-	-	1	1	2	3
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030498000	RICHARDSON	DALLAS	TRINITY	30	195	262	260	258	258
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030621000	ROWLETT	DALLAS	TRINITY	10	61	76	83	89	94
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030742000	SACHSE	DALLAS	TRINITY	20	57	73	84	93	101
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030749000	SUNNYVALE	DALLAS	TRINITY	2	13	17	21	26	27
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030669000	WYLIE	DALLAS	TRINITY	-	1	3	3	4	4
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030677000	ARGYLE	DENTON	TRINITY	-	-	2	2	2	2
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	034007000	ARGYLE WSC	DENTON	TRINITY	1	5	5	5	5	5
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030758000	AJBREY	DENTON	TRINITY	-	-	5	2	1	2
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030820000	BARTONVILLE	DENTON	TRINITY	-	-	1	2	2	2
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	034010000	BARTONVILLE WSC	DENTON	TRINITY	-	-	2	2	3	3
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030098000	CARROLLTON	DENTON	TRINITY	15	108	162	167	169	173
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030133000	COPPELL	DENTON	TRINITY	-	1	3	4	5	5
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030691000	CORINTH	DENTON	TRINITY	4	24	51	69	75	81
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	031011000	CROSS ROADS	DENTON	TRINITY	-	3	4	7	11	15
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030151000	DALLAS	DENTON	TRINITY	2	27	168	225	216	193
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030159000	DENTON	DENTON	TRINITY	14	278	1,151	1,673	2,047	2,719
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	034089000	DENTON COUNTY FWSD	DENTON	TRINITY	1	10	14	19	24	30
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030204000	FLOWER MOUND	DENTON	TRINITY	143	442	616	754	821	867
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030213000	FORT WORTH	DENTON	TRINITY	1	24	218	311	409	409
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030221000	FRISCO	DENTON	TRINITY	134	485	995	1,167	1,283	1,326
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030706000	HIGHLAND VILLAGE	DENTON	TRINITY	3	45	85	92	93	94
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030784000	JUSTIN	DENTON	TRINITY	4	16	26	44	54	60
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030355000	LEWISVILLE	DENTON	TRINITY	169	563	1,027	1,253	1,336	1,416
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030790000	LITTLE ELM	DENTON	TRINITY	4	64	124	128	128	128
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030930000	OAK POINT	DENTON	TRINITY	-	-	-	-	1	2
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030472000	PLANO	DENTON	TRINITY	2	12	13	13	13	13
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	031021000	PONDER	DENTON	TRINITY	-	6	15	28	35	37
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030799000	PROSPER	DENTON	TRINITY	1	11	23	35	39	43
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030800000	ROANOKE	DENTON	TRINITY	1	11	34	55	75	94
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030635000	SANGER	DENTON	TRINITY	-	-	2	2	3	3
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030806000	TROPHY CLUB	DENTON	TRINITY	2	13	41	58	63	69
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	034040000	BUENA VISTA - BETHEL SUD	ELLIS	TRINITY	-	2	3	3	5	5
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030192000	ENNIS	ELLIS	TRINITY	28	91	183	262	337	436
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030245000	GRAND PRAIRIE	ELLIS	TRINITY	-	2	9	16	24	35
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030384000	MANSFIELD	ELLIS	TRINITY	1	5	12	21	31	46
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030911000	MAYPEARL	ELLIS	TRINITY	-	1	1	1	1	1
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030405000	MIDLOTHIAN	ELLIS	TRINITY	21	94	268	390	463	521
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	034269000	MOUNTAIN PEAK WSC	ELLIS	TRINITY	1	4	8	11	13	16
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030729000	OVILLA	ELLIS	TRINITY	1	6	6	8	9	9
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030737000	RED OAK	ELLIS	TRINITY	1	6	9	10	11	14
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	034330000	SARDIS-LONE ELM WSC	ELLIS	TRINITY	1	6	7	8	10	13
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030633000	WAXAHACHIE	ELLIS	TRINITY	3	25	135	219	279	357
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030978000	TRENTON	FANNIN	TRINITY	-	1	2	4	5	7
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030196000	FAIRFIELD	FREESTONE	TRINITY	1	3	3	3	4	4
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030974000	TIOGA	GRAYSON	TRINITY	1	8	14	16	18	19
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030286000	HOWE	GRAYSON	TRINITY	-	1	5	1	-	-
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030976000	TOM BEAN	GRAYSON	TRINITY	-	1	1	2	2	2
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030619000	VAN ALSTYNE	GRAYSON	TRINITY	1	7	27	40	47	49
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030650000	WHITESBORO	GRAYSON	TRINITY	-	2	5	6	6	6
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030028000	ATHENS	HENDERSON	TRINITY	-	38	131	175	213	258
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	034094000	EAST CEDAR CREEK FWSD	HENDERSON	TRINITY	1	9	13	17	20	24
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030864000	EUSTACE	HENDERSON	TRINITY	1	2	4	4	4	4
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030934000	PAYNE SPRINGS	HENDERSON	TRINITY	-	1	1	1	1	1
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030767000	CRANDALL	KAUFMAN	TRINITY	6	19	25	31	39	49
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030207000	FORNEY	KAUFMAN	TRINITY	2	17	38	52	59	65
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	034115000	FORNEY LAKE WSC	KAUFMAN	TRINITY	2	13	15	16	17	18

WMS Project ID	Project Name	SRC Name	WUG ID	WUG Name	WUG County Name	WUG Basin	SS2010	SS2020	SS2030	SS2040	SS2050	SS2060
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030313004	KAUFMAN	KAUFMAN	TRINITY	-	16	2	5	5	6
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030375004	WABANK	KAUFMAN	TRINITY	-	2	3	3	4	4
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	031065004	TALTY	KAUFMAN	TRINITY	1	5	8	10	13	16
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030899004	TERRILL	KAUFMAN	TRINITY	28	78	142	181	195	214
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030828004	BLOOMING GROVE	NAVARRO	TRINITY	-	-	-	-	1	1
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030137004	CORISCANA	NAVARRO	TRINITY	-	-	-	62	147	158
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030855004	DAWSON	NAVARRO	TRINITY	-	-	-	-	1	1
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030674004	ALEDO	PARKER	TRINITY	-	4	6	8	10	11
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030213004	FORT WORTH	PARKER	TRINITY	1	41	214	308	344	377
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030574004	SPRINGTOWN	PARKER	TRINITY	4	10	16	20	23	27
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030634004	WEATHERFORD	PARKER	TRINITY	3	38	140	194	221	251
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030756004	WILLOW PARK	PARKER	TRINITY	-	-	2	-	-	-
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	034115004	FORNEY LAKE WSC	ROCKWALL	TRINITY	2	13	15	16	17	18
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030702004	HEATH	ROCKWALL	TRINITY	-	-	1	2	2	2
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	034270004	MT ZION WSC	ROCKWALL	TRINITY	-	3	4	4	4	4
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	034313004	R-C-H WSC	ROCKWALL	TRINITY	-	2	2	3	3	3
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030513004	ROCKWALL	ROCKWALL	TRINITY	9	75	109	127	133	134
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030521004	ROWLETT	ROCKWALL	TRINITY	1	7	8	8	8	8
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030669004	WYLLIE	ROCKWALL	TRINITY	-	2	3	4	6	6
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030025004	ARLINGTON	TARRANT	TRINITY	53	369	1,083	1,401	1,429	1,448
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030031004	AZLE	TARRANT	TRINITY	2	1	-	-	-	-
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030044004	BEDFORD	TARRANT	TRINITY	11	57	72	73	74	75
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030051004	BENBROOK	TARRANT	TRINITY	5	47	86	107	131	157
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030125004	COLLETVILLE	TARRANT	TRINITY	65	142	148	150	150	151
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030692004	DALWORTHINGTON GARDENS	TARRANT	TRINITY	1	5	7	7	7	7
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030180004	EDGECLIFF	TARRANT	TRINITY	-	2	3	4	4	4
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030193004	EULESS	TARRANT	TRINITY	82	236	323	346	349	351
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030213004	FORT WORTH	TARRANT	TRINITY	75	531	2,182	3,328	4,101	5,170
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030245004	GRAPE PRAIRIE	TARRANT	TRINITY	4	44	88	99	106	111
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030249004	GRAPEVINE	TARRANT	TRINITY	112	343	520	598	622	640
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030261004	HALTOM CITY	TARRANT	TRINITY	57	3	16	30	30	30
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030293004	HURST	TARRANT	TRINITY	63	161	235	268	271	273
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030315004	KELLER	TARRANT	TRINITY	9	52	85	98	98	98
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030318004	KENNEDALE	TARRANT	TRINITY	1	6	18	26	28	29
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030341004	LAKE WORTH	TARRANT	TRINITY	1	4	11	17	18	19
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	031036004	LAKE SIDE	TARRANT	TRINITY	3	11	16	18	20	24
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030384004	MANSFIELD	TARRANT	TRINITY	111	381	634	847	961	986
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030435004	NORTH RICHLAND HILLS	TARRANT	TRINITY	109	312	407	440	455	466
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030454004	PANTEGO	TARRANT	TRINITY	1	4	5	5	5	5
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030499004	RICHLAND HILLS	TARRANT	TRINITY	-	-	2	3	3	3
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030627004	SAGINAW	TARRANT	TRINITY	2	15	24	28	30	30
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030570004	SOUTH LAKE	TARRANT	TRINITY	-	-	4	4	4	4
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	031070004	WESTOVER HILLS	TARRANT	TRINITY	2	4	4	4	4	4
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030651004	WHITE SETTLEMENT	TARRANT	TRINITY	2	1	-	-	-	-
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030076004	BRIDGEPORT	WISE	TRINITY	1	7	23	36	42	51
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030153004	DECATUR	WISE	TRINITY	1	10	35	55	71	85
C01CONSEXP	MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION	030213004	FORT WORTH	WISE	TRINITY	-	8	38	60	79	98
Total							52,095	110,803	154,475	196,101	238,662	286,681

Appendix D

DB07 – Region C Current Reuse Supplies in Trinity Basin

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Appendix D
DB07 – Region C Current Reuse Supplies in Trinity Basin

WUG ID	WUG Name	WUG County Name	WUG Basin Name	SRC Name	SRC County Name	SRC Basin Name	WS2010	WS2020	WS2030	WS2040	WS2050	WS2060
030008000	ALLEN	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	2,232	2,109	2,122	1,963	1,826	1,680
034024000	BLACKLAND WSC	ROCKWALL	SABINE	INDIRECT REUSE LAVON	COLLIN	TRINITY	32	36	37	39	42	46
034024000	BLACKLAND WSC	ROCKWALL	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	13	15	16	16	18	20
034041000	CADDO BASIN SUD	COLLIN	SABINE	INDIRECT REUSE LAVON	COLLIN	TRINITY	39	38	40	43	46	49
034041000	CADDO BASIN SUD	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	18	17	19	20	21	23
034045000	CASH SUD	ROCKWALL	SABINE	INDIRECT REUSE LAVON	COLLIN	TRINITY	4	4	3	3	9	10
034065000	COLLEGE MOUND WSC	KAUFMAN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	46	69	90	97	108	122
030757043	COUNTY-OTHER	COLLIN	SABINE	INDIRECT REUSE LAVON	COLLIN	TRINITY	2	1	1	1	1	1
030757043	COUNTY-OTHER	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	37	26	20	16	13	11
030757061	COUNTY-OTHER	DENTON	TRINITY	DIRECT REUSE	DENTON	TRINITY	-	-	-	-	-	-
030757129	COUNTY-OTHER	KAUFMAN	SABINE	INDIRECT REUSE LAVON	COLLIN	TRINITY	31	24	21	18	16	15
030757129	COUNTY-OTHER	KAUFMAN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	72	55	47	41	37	34
030757199	COUNTY-OTHER	ROCKWALL	SABINE	INDIRECT REUSE LAVON	COLLIN	TRINITY	17	14	12	10	9	9
030757199	COUNTY-OTHER	ROCKWALL	TRINITY	DIRECT REUSE	ROCKWALL	TRINITY	-	-	-	-	-	-
030757199	COUNTY-OTHER	ROCKWALL	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	10	8	7	6	5	5
030757199	COUNTY-OTHER	TARRANT	TRINITY	DIRECT REUSE	TARRANT	TRINITY	-	-	-	-	-	-
030767000	GRANDALL	KAUFMAN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	69	73	79	86	97	109
034083000	CULLEOKA WSC	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	86	99	102	105	111	116
034086000	DANVILLE WSC	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	80	84	89	94	101	107
030159000	DENTON	DENTON	TRINITY	INDIRECT REUSE	DENTON	TRINITY	1,682	2,130	2,915	3,475	4,372	5,382
034096000	EAST FORK SUD	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	52	52	52	54	56	59
034096000	EAST FORK SUD	DALLAS	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	11	9	8	7	6	6
034096000	EAST FORK SUD	ROCKWALL	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	1	1	1	-	-	-
030772000	FAIRVIEW	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	162	168	185	244	371	593
030799000	FARMERSVILLE	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	53	76	91	120	160	199
030207000	FORNEY	KAUFMAN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	183	295	312	320	325	326
034115000	FORNEY LAKE WSC	KAUFMAN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	210	173	154	140	133	126
034115000	FORNEY LAKE WSC	ROCKWALL	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	165	173	154	140	133	126
030221000	FRISCO	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	2,824	3,507	3,239	3,067	2,980	2,819
030221000	FRISCO	DENTON	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	1,479	1,330	1,827	1,874	1,875	1,765
030230000	GARLAND	DALLAS	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	4,048	3,345	3,024	2,788	2,639	2,408
034137000	GASTONIA-SCURRY	KAUFMAN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	79	88	86	91	100	112
030249000	GRAPEVINE	TARRANT	TRINITY	INDIRECT REUSE	TARRANT	TRINITY	1,824	2,033	2,180	2,278	2,352	2,412
031023000	HACKBERRY	DENTON	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	13	15	17	17	16	15
030702000	HEATH	ROCKWALL	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	166	188	201	216	238	262
034205000	HIGH POINT WSC	KAUFMAN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	36	44	46	49	54	61
034205000	HIGH POINT WSC	ROCKWALL	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	3	5	5	5	6	7
031004043	IRRIGATION	COLLIN	TRINITY	DIRECT REUSE	COLLIN	TRINITY	2,227	2,227	2,227	2,227	2,227	2,227
031004049	IRRIGATION	COOKE	TRINITY	DIRECT REUSE	COOKE	TRINITY	9	9	9	9	9	9
031004057	IRRIGATION	DALLAS	TRINITY	DIRECT REUSE	DALLAS	TRINITY	561	561	561	561	561	561
031004061	IRRIGATION	DALLAS	TRINITY	DIRECT REUSE	DALLAS	TRINITY	8,000	8,000	8,000	8,000	8,000	8,000
031004129	IRRIGATION	KAUFMAN	TRINITY	DIRECT REUSE	DENTON	TRINITY	2,099	2,195	2,276	2,348	2,428	2,509
031004184	IRRIGATION	PARKER	TRINITY	DIRECT REUSE	KAUFMAN	TRINITY	576	758	927	1,116	1,359	1,659
031004184	IRRIGATION	PARKER	TRINITY	DIRECT REUSE	PARKER	TRINITY	202	202	202	202	202	202
031004184	IRRIGATION	PARKER	TRINITY	DIRECT REUSE	PARKER	TRINITY	11	11	11	11	11	11
031004220	IRRIGATION	TARRANT	TRINITY	DIRECT REUSE	ROCKWALL	TRINITY	784	784	784	784	784	784
031004220	IRRIGATION	TARRANT	TRINITY	DIRECT REUSE	TARRANT	TRINITY	1,708	1,986	2,381	2,827	3,300	3,715
031004220	IRRIGATION	TARRANT	TRINITY	INDIRECT REUSE	TARRANT	TRINITY	1,493	1,663	1,784	1,864	1,924	1,974
031031000	JOSEPHINE	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	10	21	18	15	14	13
030313000	KAUFMAN	KAUFMAN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	109	126	126	126	127	140
034230000	LAVON WSC	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	35	43	53	63	73	83
034230000	LAVON WSC	ROCKWALL	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	31	43	47	52	59	66
030790000	LITTLE ELM	DENTON	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	448	556	571	505	461	420
031041000	LOWRY CROSSING	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	30	29	29	30	31	107
030718000	LUCAS	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	97	112	115	130	169	210
031001043	MANUFACTURING	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	1,247	1,119	1,087	1,073	1,069	1,063
031001057	MANUFACTURING	DALLAS	TRINITY	DIRECT REUSE	DALLAS	TRINITY	20	20	20	20	20	20
031001057	MANUFACTURING	DALLAS	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	611	526	491	467	450	413

WSJ ID	WUG Name	WUG County Name	WUG Basin Name	SRC Name	SRC County Name	SRC Basin Name	WS2010	WS2020	WS2030	WS2040	WS2050	WS2060
031001129	MANUFACTURING	KAUFGAN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	47	39	36	34	33	32
031001199	MANUFACTURING	ROCKWALL	SABINE	INDIRECT REUSE LAVON	COLLIN	TRINITY	1	1	1	1	1	1
031001199	MANUFACTURING	ROCKWALL	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	1	1	1	1	1	1
030379000	MCKINNEY	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	2,331	2,946	3,679	4,403	4,787	5,014
031042000	MCLENDON-CHISHOLM	ROCKWALL	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	18	18	18	19	20	22
030914000	MELISSA	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	209	309	345	377	430	492
030401000	MESQUITE	DALLAS	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	2,705	2,510	2,439	2,305	2,148	1,973
034257000	MULLIGAN WSC	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	19	14	12	10	9	8
031003249	MINNING	WISE	TRINITY	DIRECT REUSE	WISE	TRINITY	15,930	14,074	12,152	10,643	9,236	8,061
034270000	MT ZION WSC	ROCKWALL	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	42	47	45	43	43	40
030724000	MURPHY	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	147	425	363	319	291	266
031045000	NEVADA	COLLIN	SABINE	INDIRECT REUSE LAVON	COLLIN	TRINITY	17	26	26	46	71	161
030923000	NEW HOPE	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	7	13	13	23	35	81
034278000	NORTH COLLIN WSC	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	25	28	40	52	72	146
030928000	OAK GROVE	KAUFGAN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	83	82	83	85	89	93
030733000	PARKER	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	12	11	11	11	12	13
030472000	PLANO	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	6,887	5,338	4,722	4,316	4,059	3,832
030487000	PLANO	DENTON	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	146	158	136	121	110	101
030487000	PRINCETON	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	63	115	175	256	389	532
030799000	PROSPER	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	105	393	501	505	494	481
030799000	PROSPER	DENTON	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	26	116	180	241	242	240
034313000	R-C-H WSC	ROCKWALL	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	39	32	29	28	27	27
030498000	RICHARDSON	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	653	775	683	580	525	479
030498000	RICHARDSON	DALLAS	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	2,401	1,869	1,599	1,399	1,266	1,155
030513000	ROCKWALL	ROCKWALL	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	795	1,096	1,204	1,195	1,119	1,021
030651000	ROWLETT	DALLAS	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	1,010	1,000	974	947	924	891
030651000	ROWLETT	ROCKWALL	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	149	122	103	91	83	75
030522000	ROYSE CITY	COLLIN	SABINE	INDIRECT REUSE LAVON	COLLIN	TRINITY	30	77	105	140	170	174
030522000	ROYSE CITY	ROCKWALL	SABINE	INDIRECT REUSE LAVON	COLLIN	TRINITY	228	320	269	293	315	292
030742000	SACHSE	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	68	86	85	78	73	68
030742000	SACHSE	DALLAS	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	217	209	208	206	207	205
031072000	SAINT PAUL	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	18	34	58	82	89	85
031002043	STEAM ELECTRIC POWER	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	75	46	46	48	52	57
031002057	STEAM ELECTRIC POWER	DALLAS	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	10	6	6	6	7	8
031002061	STEAM ELECTRIC POWER	DALLAS	TRINITY	DIRECT REUSE	DENTON	TRINITY	831	1,840	2,288	2,849	3,363	3,363
031002070	STEAM ELECTRIC POWER	DENTON	TRINITY	DIRECT REUSE	ELLIS	TRINITY	2,098	2,615	3,302	3,363	3,363	3,363
031002129	STEAM ELECTRIC POWER	KAUFGAN	TRINITY	DIRECT REUSE	KAUFGAN	TRINITY	3,000	3,000	3,000	3,000	3,000	3,000
030749000	SUNNYVALE	DALLAS	TRINITY	INDIRECT REUSE LAVON	KAUFGAN	TRINITY	167	180	197	212	229	214
031065000	TALTY	KAUFGAN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	79	97	114	132	155	181
030752000	THE COLONY	DENTON	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	49	48	46	41	38	35
030633000	WAXAHACHIE	ELLIS	TRINITY	INDIRECT REUSE LAVON	ELLIS	TRINITY	1,886	2,166	2,445	2,724	3,004	3,283
030669000	WYLLIE	COLLIN	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	624	758	807	994	949	946
030669000	WYLLIE	DALLAS	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	11	13	14	15	15	16
030669000	WYLLIE	ROCKWALL	TRINITY	INDIRECT REUSE LAVON	COLLIN	TRINITY	13	16	18	20	23	22
Total							79,340	80,663	81,853	82,700	83,900	84,749

Appendix E

DB07 – Region C WMS Reuse Supplies in Trinity Basin

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WMS Project ID	Project Name	SRC County Name	SRC Basin Name	WUG ID	WUG Name	WUG County Name	WUG Basin Name	SS2010	SS2020	SS2030	SS2040	SS2050	SS2060
C37.2	CONVEYANCE AND TREATMENT PROJECT (2)	INDIRECT REUSE	TRINITY	030044000	BEDFORD	FARRANT	TRINITY	1,600	2,968	2,336	2,677	2,485	2,433
C37.2	CONVEYANCE PROJECT (2)	DIRECT REUSE	TRINITY	03100467	IRIGATION	DALLAS	TRINITY	2,262	2,178	1,843	1,740	1,576	1,243
C37.2	CONVEYANCE PROJECT (2)	DIRECT REUSE	DALLAS	031003657	MINING	DALLAS	TRINITY	248	278	285	298	296	298
C37.2	CONVEYANCE PROJECT (2)	DIRECT REUSE	DALLAS	031002257	STEAM ELECTRIC POWER	DALLAS	TRINITY	1,410	2,459	2,900	3,457	3,768	4,546
C37.2	CONVEYANCE PROJECT (2)	DIRECT REUSE	DALLAS	031002129	STEAM ELECTRIC POWER	KALIFMAN	TRINITY	5,979	12,600	12,600	12,600	12,600	12,600
C37.2	CONVEYANCE PROJECT (2)	DIRECT REUSE	DALLAS	034040000	BUENA VISTA - BETHEL SUD	ELLIS	TRINITY	78	118	187	311	407	188
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	DALLAS	030086000	CARROLTON	DALLAS	TRINITY	647	1,421	2,459	2,360	2,209	2,037
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	DALLAS	030088000	CARROLTON	DALLAS	TRINITY	903	2,033	3,641	3,563	3,369	3,106
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	DALLAS	034066000	COMBINE WSC	DALLAS	TRINITY	29	57	61	65	69	69
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	DALLAS	030086000	LEWISVILLE	DALLAS	TRINITY	1,248	3,395	6,675	6,332	6,796	6,556
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	DALLAS	034280000	MOUNTAIN PEAK WSC	ELLIS	TRINITY	-	46	66	66	128	259
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	DALLAS	030729000	OUILLA	DALLAS	TRINITY	4	14	35	49	67	90
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	DALLAS	030729000	HACKBERRY	ELLIS	TRINITY	58	171	368	395	368	337
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	DALLAS	030720000	RED OAK	ELLIS	TRINITY	35	44	45	124	133	353
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	DALLAS	034250000	ROCKETT SUD	ELLIS	TRINITY	40	114	149	131	125	148
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	DALLAS	034325000	ROCKETT SUD	ELLIS	TRINITY	183	369	745	554	1,042	1,342
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	DALLAS	034300000	SARDIS-LOME ELM WSC	ELLIS	TRINITY	137	202	299	343	395	547
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	DALLAS	030633000	WAXAHACHIE	ELLIS	TRINITY	262	467	1,404	2,295	1,841	1,776
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	HENDERSON	030814000	ANNETTA	PARKER	TRINITY	-	113	93	101	60	67
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	HENDERSON	030897000	ANNETTA SOUTH	PARKER	TRINITY	-	28	24	27	21	24
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	HENDERSON	0307784	COUNTY-OTHER	PARKER	TRINITY	-	1,284	672	509	298	219
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	HENDERSON	030765000	WILLOW PARK	PARKER	TRINITY	-	135	191	151	224	266
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	KALIFMAN	030829000	BLUE RIDGE	COLLIN	TRINITY	180	291	411	574	640	686
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	KALIFMAN	030787000	CRANDALL	KALIFMAN	TRINITY	315	304	307	317	348	415
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	KALIFMAN	031023000	HACKBERRY	DENTON	TRINITY	67	64	67	62	58	57
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	KALIFMAN	030796000	PROSPER	COLLIN	TRINITY	248	1,624	1,949	1,870	1,779	1,827
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	KALIFMAN	030796000	PROSPER	DENTON	TRINITY	150	481	700	892	871	913
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	KALIFMAN	031002443	STEAM ELECTRIC POWER	COLLIN	TRINITY	442	291	281	279	286	315
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	KALIFMAN	031002129	STEAM ELECTRIC POWER	KALIFMAN	TRINITY	1,214	1,443	1,843	1,813	1,928	
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	NAVARRO	034017000	BETHESDA WSC	FARRANT	TRINITY	246	538	615	647	683	776
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	NAVARRO	030145000	CROWLEY	FARRANT	TRINITY	132	292	340	359	385	442
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	NAVARRO	030245000	GRAND PRAIRIE	DALLAS	TRINITY	189	432	536	657	720	759
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	NAVARRO	030245000	GRAND PRAIRIE	FARRANT	TRINITY	1,095	2,037	1,221	1,088	732	679
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	NAVARRO	030245000	GRAND PRAIRIE	FARRANT	TRINITY	288	554	318	255	151	124
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	NAVARRO	030315000	KELLER	FARRANT	TRINITY	1,509	3,206	3,090	2,751	2,483	2,398
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	NAVARRO	030318000	KENNEDALE	FARRANT	TRINITY	670	921	667	656	463	447
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	NAVARRO	031036000	LAKESIDE	FARRANT	TRINITY	286	219	233	194	218	
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	NAVARRO	031047000	NEW VIEW	FARRANT	TRINITY	121	197	186	189	158	176
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	NAVARRO	030820000	NEWARK	WISE	TRINITY	77	164	146	201	193	262
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	NAVARRO	030485000	NORTH RICHLAND HILLS	FARRANT	TRINITY	618	1,228	1,269	1,185	1,096	1,081
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	NAVARRO	031020000	NORTH LAKE	DENTON	TRINITY	88	185	343	457	498	518
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	NAVARRO	030795000	PELLICAN BAY	FARRANT	TRINITY	95	142	121	120	91	86
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	NAVARRO	030800000	ROANOKE	DENTON	TRINITY	184	543	830	1,019	1,231	1,438
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	NAVARRO	030570000	SOUTH LAKE	DENTON	TRINITY	500	500	500	500	500	500
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	NAVARRO	030570000	SOUTH LAKE	FARRANT	TRINITY	1,480	3,775	4,081	3,831	3,620	3,531
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	NAVARRO	030806000	TROPHY CLUB	DENTON	TRINITY	354	732	786	769	758	743
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	NAVARRO	030623000	WATAUGA	FARRANT	TRINITY	567	1,046	1,028	929	851	837
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	COLLIN	031004443	IRIGATION	COLLIN	TRINITY	388	197	145	125	95	90
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	COLLIN	031003943	MINING	COLLIN	TRINITY	148	80	59	51	39	38
C37.2	CONVEYANCE PROJECT (2)	INDIRECT REUSE	COLLIN	031002240	STEAM ELECTRIC POWER	FARRANT	TRINITY	500	450	1,100	2,000	2,600	2,600
C55	DIRECT REUSE	DIRECT REUSE	FARRANT	031003249	STEAM ELECTRIC POWER	WISE	TRINITY	14,337	14,133	22,428	19,652	24,648	28,520
C51	INDIRECT REUSE	INDIRECT REUSE	ELLIS	030182000	ENNIS	ELLIS	TRINITY	-	70	135	1,037	2,269	5,686
C56	INDIRECT REUSE	INDIRECT REUSE	DALLAS	030288000	IRVING	DALLAS	TRINITY	-	16,815	25,811	25,294	24,809	24,407
C50.2	PURCHASE FROM WATER PROVIDER (2)	DIRECT REUSE	DALLAS	030151000	DALLAS	COLLIN	TRINITY	851	2,512	4,422	4,361	4,128	3,876
C50.2	PURCHASE FROM WATER PROVIDER (2)	DIRECT REUSE	DALLAS	030151000	DALLAS	DALLAS	TRINITY	13,552	7,630	-	-	-	-
C50.2	PURCHASE FROM WATER PROVIDER (2)	DIRECT REUSE	DALLAS	030151000	DALLAS	DENTON	TRINITY	386	1,125	1,928	1,868	1,748	1,602
C50.2	PURCHASE FROM WATER PROVIDER (2)	DIRECT REUSE	DALLAS	03100467	IRIGATION	DALLAS	TRINITY	264	520	616	748	802	836
C50.2	PURCHASE FROM WATER PROVIDER (2)	DIRECT REUSE	DALLAS	031001061	MANUFACTURING	DENTON	TRINITY	1,308	3,800	6,177	7,205	7,224	6,238
C50.2	PURCHASE FROM WATER PROVIDER (2)	DIRECT REUSE	DALLAS	030673000	ADISON	DALLAS	TRINITY	550	1,333	2,489	2,521	2,430	2,275
C50.2	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	DALLAS	030673000	BALCH SPRINGS	DENTON	TRINITY	740	1,835	1,618	1,312	1,458	1,687
C50.2	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	DALLAS	030673000	BALCH SPRINGS	DALLAS	TRINITY	197	427	746	712	676	646
C50.2	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	DALLAS	034028000	BOLIVAR WSC	DENTON	TRINITY	48	219	219	193	193	1,000
C50.2	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	DALLAS	034028000	BOLIVAR WSC	DENTON	TRINITY	250	465	1,159	1,626	2,588	1,931
C50.2	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	DALLAS	030123000	CEDAR HILL	DALLAS	TRINITY	462	1,288	2,617	2,808	2,874	2,821
C50.2	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	DALLAS	030103000	CELINA	COLLIN	TRINITY	280	2,525	4,428	6,216	13,087	12,753
C50.2	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	DALLAS	030766000	COMBINE	DALLAS	TRINITY	8	17	30	31	32	36
C50.2	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	DALLAS	030766000	COMBINE	DALLAS	TRINITY	16	17	30	31	32	33
C50.2	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	DALLAS	030133000	COPPELL	KALIFMAN	TRINITY	11	30	61	69	76	83
C50.2	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	DALLAS	030133000	COPPELL	DALLAS	TRINITY	601	1,316	2,247	2,148	1,992	1,819
C50.2	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	DALLAS	030133000	COPPELL	DENTON	TRINITY	6	19	40	45	48	48

WMS Project ID	Project Name	SRC Name	SRC County Name	SRC Basin Name	WUG ID	WUG Name	WUG County Name	WUG Basin Name	SS2010	SS2020	SS2030	SS2040	SS2050	SS2060
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	003834000	COOPER CANYON	DEWITT	TRINITY	129	254	267	291	341	397
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	0037261	COUNTY-OTHER	DEWITT	TRINITY	1661	3438	2,813	2,333	747	617
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	03101000	CROSS ROUNDS	DEWITT	TRINITY	187	616	701	859	1,386	1,785
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00453000	DALLAS COUNTY WCID #6	DALLAS	TRINITY	3,123	46,635	94,838	97,927	97,668	101,489
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00398900	DOBIE OAK	DEWITT	TRINITY	35	102	202	217	235	292
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00317600	DUNCANVILLE	DEWITT	TRINITY	248	332	326	282	247	232
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00319800	FARMERS BRANCH	DALLAS	TRINITY	475	1,089	1,882	1,818	1,720	1,600
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00321000	FERRIS	DALLAS	TRINITY	672	1,602	2,937	2,978	2,913	2,783
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00244000	FLOWER MOND	DEWITT	TRINITY	-	183	183	183	243	243
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	002697000	GLEN HEIGHTS	DALLAS	TRINITY	1,232	4,624	4,575	4,253	2,813	2,544
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00267000	GLEN HEIGHTS	DALLAS	TRINITY	44	121	121	245	288	280
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00245000	GRAND PRAIRIE	DALLAS	TRINITY	16	50	109	128	143	156
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00255000	GRAND PRAIRIE	THURMAN	TRINITY	1,186	3,046	6,215	7,188	7,999	8,579
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00246000	GRANT RURAL WSC	THURMAN	TRINITY	316	828	1,638	1,663	1,653	1,568
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	04146000	GRANT RURAL WSC	GRAVSON	TRINITY	287	358	358	325	317	478
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00276000	HEBBON	DEWITT	TRINITY	51	72	74	82	84	206
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00294000	HECKORY CREEK	DEWITT	TRINITY	117	35	100	180	286	292
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00294000	HECKORY CREEK	DEWITT	TRINITY	164	372	328	292	380	433
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00294000	HUTCHINS	TRINITY	TRINITY	72	314	862	1,236	1,535	1,489
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00298000	JOHNSON COUNTY RURAL SUD	DALLAS	TRINITY	880	297	511	491	553	624
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	002421000	LAGRANGEVILLE RURAL SUD	DEWITT	TRINITY	50	49	72	59	52	52
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00682000	LAGRANGEVILLE	DEWITT	TRINITY	381	671	58	60	83	125
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00397000	LAKE DALLAS	DEWITT	TRINITY	381	672	512	401	420	458
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00345000	LANCASTER	DEWITT	TRINITY	428	1,505	3,211	3,687	3,903	3,830
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00190181	MANUFACTURING	DEWITT	TRINITY	24	84	84	78	83	94
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	01160000	NORTH LAKE	DEWITT	TRINITY	24	49	49	49	49	49
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00290000	OAK LEAF	DEWITT	TRINITY	20	52	102	110	116	119
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00293000	OAK POINT	DEWITT	TRINITY	143	374	353	326	397	485
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00293000	PEACOCK HILL	DEWITT	TRINITY	858	229	37	40	39	47
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	01010000	PONDERT	DEWITT	TRINITY	488	1,215	1,700	2,013	2,322	1,880
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00299000	PROSPER	COLLIN	TRINITY	488	1,133	1,087	889	942	991
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00299000	PROSPER	TRINITY	TRINITY	125	336	390	425	461	486
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00261000	PROSPER	DALLAS	TRINITY	2,620	3,251	3,782	3,782	3,782	3,782
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00295000	SHILOH SHOERS	DEWITT	TRINITY	95	198	198	148	173	210
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00291000	VALLEY VIEW	COOKE	TRINITY	135	212	230	227	382	472
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00267000	VALLEY VIEW	DALLAS	TRINITY	105	254	464	484	484	594
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00407000	WAGLER WSC	DEWITT	TRINITY	185	277	205	161	173	182
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00400000	WAGLER WSC	DEWITT	TRINITY	20	390	20	72	89	102
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00681000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00681000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY	00498000	WAGLER WSC	DEWITT	TRINITY	1419	2,397	1,881	1,542	1,639	1,895
CS02	PURCHASE FROM WATER PROVIDER 12	INDIRECT REUSE	DALLAS	TRINITY										

WMS Project ID	Project Name	SRC Name	SRC County Name	SRC Basin Name	WUG ID	WUG Name	WUG County Name	WUG Basin Name	SS2010	SS2020	SS2030	SS2040	SS2050	SS2060
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	HENDERSON	TRINITY	030935000	ELLIS	ELLIS	TRINITY	-	5	5	3	11	14
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	HENDERSON	TRINITY	030935000	PECAN HILL	ELLIS	TRINITY	-	5	5	3	11	14
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	HENDERSON	TRINITY	034260000	ELLS	ELLIS	TRINITY	-	14	14	34	43	43
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	HENDERSON	TRINITY	034260000	ROCKETT SUD	ELLIS	TRINITY	-	14	14	34	43	43
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	HENDERSON	TRINITY	034260000	ROCKETT SUD	ELLIS	TRINITY	-	22	22	41	41	41
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	HENDERSON	TRINITY	034325000	ROCKETT SUD	ELLIS	TRINITY	-	270	493	497	507	561
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	HENDERSON	TRINITY	034325000	SHADLONS ELM WSC	ELLIS	TRINITY	-	52	89	86	93	107
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	HENDERSON	TRINITY	031020200	STEAM ELECTRIC POWER	ELLIS	TRINITY	-	49	110	133	150	160
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	HENDERSON	TRINITY	030730000	TOOL	ELLIS	TRINITY	-	332	452	437	504	534
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	HENDERSON	TRINITY	030630000	WAKAHACHEE	ELLIS	TRINITY	-	65	133	187	1046	2362
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	HENDERSON	TRINITY	034310000	WEST CEDAR CREEK MUD	HENDERSON	TRINITY	-	1325	1980	2017	2439	2685
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	HENDERSON	TRINITY	034310000	WEST CEDAR CREEK MUD	HENDERSON	TRINITY	-	1325	1980	2017	2439	2685
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030813000	ANNA CEDAR	COLLIN	TRINITY	1046	1290	1463	1712	1747	2184
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	034024000	BLACKLAND WSC	COLLIN	TRINITY	148	144	144	144	153	177
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	034024000	BLACKLAND WSC	COLLIN	TRINITY	62	64	62	62	65	76
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	034024000	CADDO BASIN SUD	COLLIN	TRINITY	174	174	213	198	217	441
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030160000	DELINA	COLLIN	TRINITY	243	650	1003	1538	1931	2388
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	034050000	COLLEGE MOUND WSC	KALFMAN	TRINITY	210	286	351	359	389	465
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030767043	COUNTY OTHER	COLLIN	TRINITY	10	15	15	20	-	-
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030767043	COUNTY OTHER	COLLIN	TRINITY	166	97	88	43	51	44
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030767043	COUNTY OTHER	COLLIN	TRINITY	4	4	3	4	3	3
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030767043	COUNTY OTHER	COLLIN	TRINITY	4	4	3	4	3	3
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030767129	COUNTY OTHER	KALFMAN	TRINITY	86	125	88	100	35	34
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030767129	COUNTY OTHER	KALFMAN	TRINITY	384	508	175	119	158	152
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030767199	COUNTY OTHER	KALFMAN	TRINITY	166	224	94	79	70	67
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030767199	COUNTY OTHER	KALFMAN	TRINITY	238	214	204	200	204	223
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	034066000	EAST FORK SUD	COLLIN	TRINITY	50	36	29	25	23	21
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	034066000	EAST FORK SUD	COLLIN	TRINITY	3	2	2	2	2	1
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030199000	FARMERSVILLE	COLLIN	TRINITY	244	313	353	442	576	798
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	034115000	FARMERSVILLE	COLLIN	TRINITY	960	1717	1588	1520	1476	1476
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	034115000	FARMERSVILLE	COLLIN	TRINITY	752	717	598	520	478	478
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030221000	FRISCO	COLLIN	TRINITY	319	6336	9385	9315	9510	6371
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030221000	FRISCO	COLLIN	TRINITY	5401	5686	7853	7216	7242	5594
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	034310000	FRISCO	COLLIN	TRINITY	362	363	335	335	335	426
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	034310000	GASTONIA-SCURRY	KALFMAN	TRINITY	762	775	762	798	858	948
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030702000	HEATH	ROCKWALL	TRINITY	236	211	199	200	207	242
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	034295000	HIGH POINT WSC	ROCKWALL	TRINITY	22	22	22	22	23	27
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030286000	HOWE	GRAYSON	TRINITY	154	282	344	378	325	344
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	031004199	IRIGATION	ROCKWALL	TRINITY	414	414	246	209	137	132
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	031004199	JOSEPHINE	COLLIN	TRINITY	45	86	68	56	51	49
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030373000	KALFMAN	KALFMAN	TRINITY	498	520	492	466	468	532
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030373000	KALFMAN	KALFMAN	TRINITY	144	177	184	193	212	248
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	034230000	LAVON WSC	ROCKWALL	TRINITY	-	4	4	4	4	6
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030362000	LEONARD	FANNIN	TRINITY	65	119	208	240	240	240
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030362000	LEONARD	FANNIN	TRINITY	2,044	2,298	2,221	1,989	1,659	1,598
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030718000	LUCAS	COLLIN	TRINITY	446	464	442	482	606	797
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	031001043	MANUFACTURING	GRAYSON	TRINITY	1,461	1,187	1,085	1,019	969	1,037
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	031001043	MANUFACTURING	GRAYSON	TRINITY	72	42	34	32	25	26
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	031001129	MANUFACTURING	KALFMAN	TRINITY	216	314	140	155	121	131
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	031001199	MANUFACTURING	ROCKWALL	TRINITY	2	12	13	12	18	18
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	031042000	MALENDON-CHISHOLM	ROCKWALL	TRINITY	84	74	71	70	72	82
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030914000	MELISSA	COLLIN	TRINITY	954	1,276	1,340	1,393	1,551	1,871
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030914000	MELISSA	COLLIN	TRINITY	6,272	8,126	8,185	7,628	7,215	7,025
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	034270000	MESQUITE	ROCKWALL	TRINITY	181	194	173	153	154	152
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030740000	MURPHY	COLLIN	TRINITY	669	1,758	1,412	1,181	1,049	1,010
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	031045000	NEVADA	COLLIN	TRINITY	76	107	103	172	254	612
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030746000	NORTH COLLIN WSC	TRINITY	377	338	323	313	321	326	
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030730000	PARKER	KALFMAN	TRINITY	53	45	42	42	43	50
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030730000	PARKER	COLLIN	TRINITY	825	1,235	1,454	1,988	2,580	3,398
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030472000	PLANO	COLLIN	TRINITY	11,691	13,652	14,322	13,689	12,848	10,744
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030487000	PRINCETON	COLLIN	TRINITY	292	475	680	946	1,401	2,023
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	034313000	R-C-H WSC	ROCKWALL	TRINITY	176	133	115	102	97	100
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030488000	RICHARDSON	DALLAS	TRINITY	6,763	5,617	5,299	4,538	2,718	2,111
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030488000	RICHARDSON	DALLAS	TRINITY	1,962	4,882	3,790	3,501	3,328	3,388
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030521000	ROWLETT	ROCKWALL	TRINITY	678	503	462	337	298	288
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030522000	ROYSE CITY	COLLIN	TRINITY	136	319	410	517	612	663
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030522000	ROYSE CITY	ROCKWALL	TRINITY	1,043	1,323	1,046	1,085	1,133	1,110
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030742000	SACHSE	DALLAS	TRINITY	901	863	809	761	908	946
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	031072000	SAINT PAUL	COLLIN	TRINITY	83	142	227	304	320	326
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	034386000	SOUTH GRAYSON WSC	COLLIN	TRINITY	28	25	16	12	8	6
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	034386000	SOUTH GRAYSON WSC	GRAYSON	TRINITY	30	24	24	23	18	18
C502	PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE	KALFMAN	TRINITY	030745000	SUNNYSIDE	DALLAS	TRINITY	762	743	766	785	824	812

Appendix 3D

Region H Drought Contingency Plans

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Table 3D-1
Major Water Provider Drought Triggers

MWP	Drought Type	Trigger Condition		Time requirement	Actions	
		Local Reservoirs	System Reservoirs		Local Reservoirs	System Reservoirs
BRA	Watch	Storage is < Stage 1 Trigger level and could be reduced to Stage 2 Trigger or less during the next 12 months	Storage of the Authority system is < Stage 1 Trigger level and could be reduced to Stage 2 Trigger or less during the next 12 months	Condition lasts 30 consecutive days	Inform/meet with customers, urge activation of drought contingency plans, prepare/initiate specific drought response plan, activate storage in Federal reservoirs	Inform/meet with customers, urge activation of drought contingency plans, prepare/initiate specific drought response plan, activate storage in Federal reservoirs
		Storage is < Stage 2 Trigger level and could be reduced to Stage 3 Trigger or less during the next 12 months	Storage of the Authority system is < Stage 2 Trigger level and could be reduced to Stage 3 Trigger or less during the next 12 months	Condition lasts 30 consecutive days	Inform/meet with customers, require activation of drought contingency plans, evaluate alternative actions, update specific drought response plan, activate storage in Federal reservoirs	Inform/meet with customers, require activation of drought contingency plans, evaluate alternative actions, update specific drought response plan, activate storage in Federal reservoirs
		Storage is < Stage 3 Trigger level	Storage of the Authority system is < Stage 3 Trigger level	Condition lasts 30 consecutive days	Continue Stage 1 & 2 actions, additional actions as deemed necessary	Continue Stage 1 & 2 actions, additional actions as deemed necessary
GCWA	Emergency	Brazos River - Hempstead Gauge	Brazos River - Richmond Gauge			
		14.00 ft or 2200 cfs	12.19 ft or 1700 cfs	Condition ceases for 30 consec. days	Notify BRA, monitor situation daily	
		13.71 ft or 2000 cfs	11.93 ft or 1500 cfs	Condition ceases for 30 consec. days	Alert customers, increase maintenance	
		13.41 ft or 1800 cfs	11.65 ft or 1300 cfs	Condition ceases for 30 consec. days	Request stored water releases, if needed	
		12.93 ft or 1500 cfs	11.23 ft or 1000 cfs	Condition ceases for 30 consec. days	Request stored water releases	
		GCWA delivery or storage system outage, or extreme fire flows (industrial) that temporarily interrupts service to customers.		Until condition corrected	Notify customers, minimize service interruptions while making repairs	

**Table 3D-1
Major Water Provider Drought Triggers**

MWP	Drought Type	Lakes Conroe, Houston & Livingston	Trigger Condition		Time requirement	Actions					
			Municipal water demand / production	Municipal water distribution system							
Houston	Mild	Combined storage = 24 months surface water supply	Average production = 80% of combined surface and ground water capacity	Average system pressure is 45 psi	Condition lasts 10 consecutive days	Inform the public and request voluntary reductions					
			Average production = 85% of combined surface and ground water capacity	Average system pressure is 40 psi							
			Combined storage = 18 months surface water supply								
			Combined storage = 12 months surface water supply								
SJRA	Critical	Lake Conroe	Woodlands GW System		Condition lasts 10 consecutive days	Ban all outdoor use and listed water waste	GW System				
			Lake Conroe	Combined Pumpage > 75% of capacity for 3 days, Plant operator's call based on usage and weather				Condition ceases for 7 days	Request voluntary conservation	Voluntary conservation, increased leak repair	
				Mild				Combined pumpage > 85% of capacity for 3 days, or 90% of capacity for 1 day, or 95% of 1 plant for 3 days, or storage does not recover to 70% capacity overnight	Condition ceases for 7 days	Weekly customer meetings, mandatory conservation	Odd/even watering cycle, cease fountains and non-fire hydrant use
				Moderate				Elev < 190 ft (55% capacity)	Condition ceases for 7 days	Additional mandatory or pro-rata use reductions, look for alternate sources	2-day watering cycle, ban other outdoor use, reduce system pressure during peak periods
	Severe	Elev < 185 ft (40% capacity)	Combined pumpage > 90% of capacity for 3 days, or 95% of capacity for 1 day, or 95% of 1 plant for 3 days, or storage does not recover to 50% capacity overnight	Condition ceases for 7 days	Inform customers, make specific response based on situation	Ban all uses but for health and safety, isolate elevated storage for fire reserve					
	Critical	Delivery system failure or supply contamination	Delivery system failure or supply contamination	Delivery system failure or supply contamination	Until condition corrected						

**Table 3D-1
Major Water Provider Drought Triggers**

MWP	Drought Type	Trigger Condition			Time requirement	Actions
		Huntsville RWSS	Livingston RWSS	Trinity County RWSS		
TRA	Mild	Demand > 6 MGD for 30 days	Demand > 2 MGD for 15 days	Wellfield or plant capacity <1000 gpm, or use 5% > allocation	Condition ceases to exist for 5 days	Voluntary reductions, monthly updates
	Moderate	Demand > 7 MGD for 20 days	Demand > 2.25 MGD for 10 days	Wellfield or plant capacity <850 gpm, or use 15% > allocation	Condition ceases to exist for 5 days	Ban non-essential use, prep pro-rata reduction plan
	Severe	Demand > 7.5 MGD for 10 days	Demand > 2.5 MGD for 5 days	Wellfield or plant capacity <700 gpm, or use 25% > allocation	Condition ceases to exist for 5 days	Initiate pro-rata reduction plan
	Emergency	Major system failure (>50% of delivery capacity lost) or supply contamination	Major system failure (>50% of delivery capacity lost) or supply contamination	Major system failure (>50% of delivery capacity lost) or supply contamination	Until condition corrected	Inform customers, make specific response based on situation
			Lake Livingston / Wallisville System			
		Mild	Lake Livingston elev < 126.50 ft at USGS gage			Condition ceases to exist for 5 days
	Moderate	Lake Livingston elev < 124.00 ft at USGS gage			Condition ceases to exist for 5 days	No new contracts, initiate mandatory reductions and pro-rata curtailments
	Severe	Lake Livingston elev < 121.40 ft at USGS gage			Condition ceases to exist for 5 days	Terminate supply to low-priority customers, additional mandatory reductions
	Emergency	Major system failure (>50% of delivery capacity lost) or supply contamination			Until condition corrected	Inform customers, make specific response based on situation

**Table 3D-2
Source-Specific Drought Triggers
Established by Major Water Providers**

Water Source	Drought Type	Trigger Condition	Time Requirement		Established By	Actions
			Initiation	Termination		
Trinity River						
Lake Livingston	Mild	Combined storage (Lakes Livingston, Conroe & Houston) is less than 24 months surface water supply	Condition exists 10 consecutive days	Condition ceases for 30 consecutive days	Houston	Inform the public and request voluntary reductions
	Serious	Combined storage (Lakes Livingston, Conroe & Houston) is less than 18 months surface water supply	Condition exists 10 consecutive days	Condition ceases for 30 consecutive days	Houston	Ban non-essential outdoor use and listed water waste
	Severe	Combined storage (Lakes Livingston, Conroe & Houston) is less than 12 months surface water supply	Condition exists 10 consecutive days	Condition ceases for 30 consecutive days	Houston	Ban all outdoor use and listed water waste
Lake Livingston / Wallisville System	Mild	Lake Livingston elev < 126.50 ft at USGS gage	Condition exists for one day	Condition ceases to exist for 5 days	TRA	Modify gate operations, voluntary reductions, monthly updates
	Moderate	Lake Livingston elev < 124.00 ft at USGS gage	Condition exists for one day	Condition ceases to exist for 5 days	TRA	No new contracts, initiate mandatory reductions and pro-rata curtailments
	Severe	Lake Livingston elev < 121.40 ft at USGS gage	Condition exists for one day	Condition ceases to exist for 5 days	TRA	Terminate supply to low-priority customers, additional mandatory reductions

**Table 3D-2
Source-Specific Drought Triggers
Established by Major Water Providers**

Water Source	Drought Type	Trigger Condition	Time Requirement		Established By	Actions
			Initiation	Termination		
San Jacinto River						
Lake Conroe	Mild	Elev < 198 ft (85% of storage capacity)	Condition exists for one day	Condition ceases for 7 days	SJRA	Request voluntary conservation Weekly customer meetings,
	Moderate	Elev < 190 ft (55% of storage capacity)	Condition exists for one day	Condition ceases for 7 days	SJRA	mandatory conservation Additional mandatory or pro-rata use reductions, look for alternate sources
	Severe	Elev < 185 ft (40% of storage capacity)	Condition exists for one day	Condition ceases for 7 days	SJRA	
Lake Houston	Mild	Combined storage (Lakes Livingston, Conroe & Houston) is less than 24 months surface water supply	Condition exists 10 consecutive days	Condition ceases for 30 consecutive days	Houston	Inform the public and request voluntary reductions
	Serious	Combined storage (Lakes Livingston, Conroe & Houston) is less than 18 months surface water supply	Condition exists 10 consecutive days	Condition ceases for 30 consecutive days	Houston	Ban non-essential outdoor use and listed water waste
	Severe	Combined storage (Lakes Livingston, Conroe & Houston) is less than 12 months surface water supply	Condition exists 10 consecutive days	Condition ceases for 30 consecutive days	Houston	Ban all outdoor use and listed water waste

**Table 3D-2
Source-Specific Drought Triggers
Established by Major Water Providers**

Water Source	Drought Type	Trigger Condition	Time Requirement		Established By	Actions
			Initiation	Termination		
Brazos River						
	Mild	14.00 ft or 2200 cfs	Condition exists for one day	Condition ceases for 30 consec. days	GCWA	Notify BRA, monitor situation daily
	Moderate	13.71 ft or 2000 cfs	Condition exists for one day	Condition ceases for 30 consec. days	GCWA	Alert customers, increase maintenance
	Watch	13.41 ft or 1800 cfs	Condition exists for one day	Condition ceases for 30 consec. days	GCWA	Request stored water releases, if needed
	Warning	12.93 ft or 1500 cfs	Condition exists for one day	Condition ceases for 30 consec. days	GCWA	Request stored water releases
Richmond Gauge	Mild	12.19 ft or 1700 cfs	Condition exists for one day	Condition ceases for 30 consec. days	GCWA	Notify BRA, monitor situation daily
	Moderate	11.93 ft or 1500 cfs	Condition exists for one day	Condition ceases for 30 consec. days	GCWA	Alert customers, increase maintenance
	Watch	11.65 ft or 1300 cfs	Condition exists for one day	Condition ceases for 30 consec. days	GCWA	Request stored water releases, if needed
	Warning	11.23 ft or 1000 cfs	Condition exists for one day	Condition ceases for 30 consec. days	GCWA	Request stored water releases
BRA Local Reservoirs						
	Watch	Storage is < Stage 1 Trigger level and could be reduced to Stage 2 Trigger or less during the next 12 months	Condition exists for one day	Condition ceases for 30 consecutive days	BRA	Inform/meet with customers, urge activation of drought contingency plans, prepare/initiate specific drought response plan, activate storage in Federal reservoirs
	Warning	Storage is < Stage 2 Trigger level and could be reduced to Stage 3 Trigger or less during the next 12 months	Condition exists for one day	Condition ceases for 30 consecutive days	BRA	Inform/meet with customers, require activation of drought contingency plans, evaluate alternative actions, update specific drought response plan, activate storage in Federal reservoirs
	Emergency	Storage is < Stage 3 Trigger level	Condition exists for one day	Condition ceases for 30 consecutive days	BRA	Continue Stage 1 & 2 actions, additional actions as deemed necessary

**Table 3D-2
Source-Specific Drought Triggers
Established by Major Water Providers**

Water Source	Drought Type	Trigger Condition	Time Requirement		Established By	Actions
			Initiation	Termination		
		Storage of the Authority system is < Stage 1 Trigger level and could be reduced to Stage 2 Trigger or less during the next 12 months	Condition exists for one day	Condition ceases for 30 consecutive days	BRA	Inform/meet with customers, urge activation of drought contingency plans, prepare/initiate specific drought response plan, activate storage in Federal reservoirs
BRA System Reservoirs	Watch					
		Storage of the Authority system is < Stage 2 Trigger level and could be reduced to Stage 3 Trigger or less during the next 12 months	Condition exists for one day	Condition ceases for 30 consecutive days	BRA	Inform/meet with customers, require activation of drought contingency plans, evaluate alternative actions, update specific drought response plan, activate storage in Federal reservoirs
	Warning					
	Emergency	Storage of the Authority system is < Stage 3 Trigger level	Condition exists for one day	Condition ceases for 30 consecutive days	BRA	Continue Stage 1 & 2 actions, additional actions as deemed necessary
Gulf Coast Aquifer		Local triggers based on pumping/delivery system limits, not aquifer levels.				
Carrizo-Wilcox Aquifer		Local triggers based on pumping/delivery system limits, not aquifer levels.				
Sparta Aquifer		Local triggers based on pumping/delivery system limits, not aquifer levels.				
Queen City Aquifer		Local triggers based on pumping/delivery system limits, not aquifer levels.				
Brazos River Alluvium		Local triggers based on pumping/delivery system limits, not aquifer levels.				

Appendix 3E

Potential Reservoir Sites

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Region H
Table 3E: Previously Studied Potential Reservoir Sites

LARGE RESERVOIR SITES (OVER 50,000 ACRE-FEET)									
Reservoir / River Basin	Yield, Acre-Feet	Reference	Recommended Project in the 2007 Texas State Water Plan	Recommended Unique Site in the 2007 Texas State Water Plan	Original Cost at Dam, Million \$	Reference	Comments	Reference	
Allens Creek Brazos Basin	99,650	10	Yes	No (see comments)	\$169.0 in 1997	6	This project has been designated as a unique reservoir site by the Texas Legislature. A water right permit has been granted to the BRA and City of Houston. Detailed design and environmental studies are on-going.		
Bedias	70,000	7			\$143.3 in 1995	5			
Trinity Basin	90,732	4	No	Yes	\$50.7 in 1975	12	This project has been designated as a unique reservoir site by the Texas Legislature. Some endangered species have been identified. There are 24,675 acres lost of which 7,328 acres of bottomland hardwoods and 15,327 units of wildlife habitats are lost. Included in Region C Water Plan for TRA.	3	
	70,705	2			\$50.8 in 1975	7			
	84,370	1					Site is listed in the Trinity River Basin Master Plan.	11	
Cleveland							Some endangered species have been identified. There are 11,485 acres lost of which 2,330 acres of bottomland hardwoods and 4,845 units of wildlife habitats are lost. Alternative site in the 1997 Texas Water Plan.		
San Jacinto Basin	65,900		No	No	\$76.5 in 1975	7		3	
(Lower) Lake Creek							Some endangered species have been identified. There are 10,904 acres lost of which 2,200 acres of bottomland hardwoods and 6,195 units of wildlife habitats are lost. Site is listed in COH Master Plan.	3, 4	
San Jacinto Basin	53,767	4	No	No	\$65.5 in 1975	7			
	67,213	12			\$275.0 in 1990	12			
	73,012	2							
Little River							Also included in Brazos G Regional Water Plan. This project has been designated as a unique reservoir site by the Texas Legislature.		
Brazos Basin	129,000	8	No	Yes				8	
Little River - Off Channel							Also included in Brazos G Regional Water Plan. This project has been designated as a unique reservoir site by the Texas Legislature.		
Brazos Basin	32,110	8	Yes	Yes	96.0 in 2001			8	
							Some endangered species have been identified. There are 63,410 acres lost of which 26,730 acres of bottomland hardwoods and 29,323 units of wildlife habitats are lost. Reservoir site also included in Brazos G Regional Water Plan.	3, 9	
Millican/Panther Creek	252,032	4	No	No	\$318.0 in 1971	7		9	
Brazos Basin	248,600	2							
	252,225	12							
	235,200	8							
Millican/Bundic Crossing							Formerly called Millican-Peach Creek. The site contains a large lignite deposit. Also included in Brazos G Regional Water Plan.	9	
Brazos Basin	73,800	8	No	No			A few endangered species have been identified. There are 14,804 acres lost of which 6,993 acres of bottomland hardwoods and 9,093 units of wildlife habitats are lost. This site contains a lignite deposit. Site is listed in the Trinity River Basin Master Plan and Region C Water Plan.	3, 9, 11	
Tehuacana									
Trinity Basin	282,500	12	No	Yes	\$156.0 in 1995	5			
	61,068	1							

Region H
Table 3E: Previously Studied Potential Reservoir Sites

Reservoir/ River Basin	Yield, Acre-Feet	Reference	Recommended Project in the 2002 Texas State Water Plan	Recommended Unique Site in the 2002 Texas State Water Plan	Original Cost at Dam, Million \$	Reference	Comments	Reference
	68,300	5						
Tennessee Colony Trinity Basin	405,492 405,802	4 12	No	No	\$509.0 in 1970	6	This project is large enough to be a regional water source possibility. Some endangered species have been identified. There are 85,053 acres lost of which 34,767 acres of bottomland hardwoods and 43,031 units of wildlife habitats are lost. A large lignite deposit is also on site. Site is listed in the Trinity River Basin Master Plan. The water rights are senior to Livingston rights and would impact current available supply.	3, 11
	997,112	5						
SMALLER RESERVOIR SITES (UNDER 50,000 ACRE-FEET)								
		3						
Reservoir/ River Basin	Yield, Acre-Feet	Reference	Recommended Project in the 2002 Texas State Water Plan	Recommended Unique Site in the 2002 Texas State Water Plan	Original Cost at Dam, Million \$	Reference	Comments	Reference
Big Elkhart Creek Trinity Basin	12,320	11	No	No	N/A		Site is listed in the Trinity River Basin Master Plan.	11
Caney Trinity Basin	15,694 25,880	12 4	No	No	N/A		Site is listed in the Trinity River Basin Master Plan. Alternative site in the 1997 Texas Water Plan.	11
Gail Creek Trinity Basin	19,040	11	No	No	N/A		Site is listed in the Trinity River Basin Master Plan.	11
Harmons Trinity Basin	10,089	12	No	No	N/A		Site is listed in the Trinity River Basin Master Plan. Alternative site in the 1997 Texas Water Plan.	11
Humble San Jacinto Basin	11,809	1					Alternative site in the 1997 Texas Water Plan. There are 35,800 acres of affected area.	7
Hurricane Trinity Basin	17,936 16,546	12 1	No	No	N/A		Site is listed in the Trinity River Basin Master Plan. Alternative site in the 1997 Texas Water Plan.	11
Liberty Long King Trinity Basin	N/A 20,178	7 12	No	No	N/A		Capers Ridge site from 1956 TRA Master Plan. Site now permitted for the Luce Bayou Pump station Site is listed in the Trinity River Basin Master Plan. Alternative site in the 1997 Texas Water Plan.	11 11
Lower Keechie Trinity Basin	34,869 25,783	1 12					Site is listed in the Trinity River Basin Master Plan. Alternative site in the 1997 Texas Water Plan.	11
Mustang Trinity Basin	28,513 15,694	1 12	No	No	N/A		Site is listed in the Trinity River Basin Master Plan. Alternative site in the 1997 Texas Water Plan.	11 11
	24,890	1						

Region H
Table 3E: Previously Studied Potential Reservoir Sites

Navasota	N/A						Original site had 58,180 acres of affected area. This location is now in the tail-water of the proposed Millican-Bundic Crossing Reservoir.	7	7
Brazos Basin									
Nelsons	17,936	12	No	No			Site is listed in the Trinity River Basin Master Plan. Alternative site in the 1997 Texas Water Plan.	11	11
Trinity Basin	8,849	1							
Oak Knoll									
Brazos Basin	N/A		No	No			Original site had 4,302 acres of affected area. This location is now in the tail-water of the proposed Millican-Bundic Crossing Reservoir.	7	7
Spring Creek Lake	7,500		No	No					
San Jacinto Basin	26,900	4							
Upper Keechi									
Trinity Basin	15,694	12	No	No			Site is listed in the Trinity River Basin Master Plan. Alternative site in the 1997 Texas Water Plan.	11	11
Upper Lake Creek	16,317	1							
San Jacinto Basin			No	No			Alternative site in the 1997 Texas Water Plan.		

REFERENCES:

- 1 1986. Trinity River Yield Study Phase III: Yield Analysis. By Espey, Huston & Associates, Inc.
- 2 1988. San Jacinto River Authority Water Resources Development Plan-Water Supply Plan, Pate Engineers, Inc.
- 3 1990 (Texas Parks & Wildlife Dept.), and (U.S. Fish & Wildlife Service). Texas Water and Wildlife. A Natural Resource Survey for
- 4 1991. Houston Water Master Plan, Appendix L, Table 2-8, revised by Metcalf & Eddy.
- 5 1996. Memorandum Report Updated Water Project Opinions of Cost. Freese and Nichols, Inc.
- 6 1997. Trans-Texas Water Program Southeast Area, Operation Studies and Opinions of Cost for Allens Creek Reservoir Volume I - Text.
- 7 1997. Water for Texas, A Consensus-Based Update to the State Water Plan, TWDB
- 8 2001. Brazos G Regional Water Plan
- 9 2001. Region C Water Plan
- 10 2001. Region H Water Plan
- 11 2003. Trinity River Basin Master Plan, Update
- 12 Additional information collected in 1999 from River Authorities

Appendix 3F

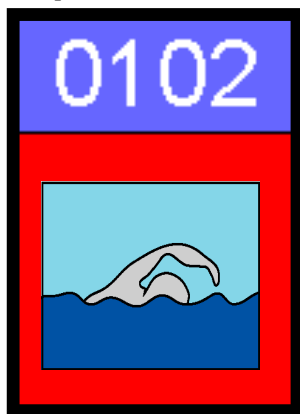
Water Quality Basin Maps

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Explanation of Water Quality Indicator Icons Used on the Basin Maps

Basin maps are provided as a quick reference to the general location of classified segments within the basin. Icons are used to indicate the presence of threatened, partially supported, and nonsupported designated uses and water quality concerns.

Conceptual Icon

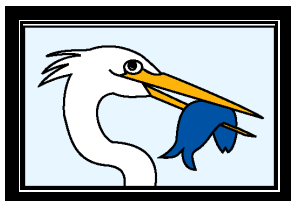


Blue bar identifies segment number

Internal symbol identifies indicator used to assess a use or concern

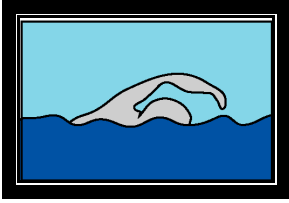
Border color indicates level of use support or presence of water quality concern. Green = threatened use, yellow = partially supported use, red = nonsupported use, and orange = water quality concern.

Icons for Designated Uses



Aquatic Life

A specific subcategory of aquatic life use (exceptional, high, intermediate, limited, or minimal) is assigned to each water body for protection and propagation of desirable fish, benthic macroinvertebrates, and other aquatic biota. Support of the use is determined by four indicators (dissolved oxygen criteria, acute and chronic toxic substances in water criteria, ambient water and sediment toxicity test results, and fish and macrobenthos data).



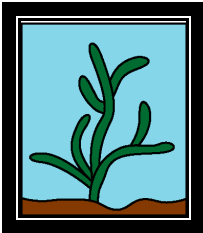
Contact Recreation

The contact recreation use is assigned to water bodies where recreational activities including wading by small children, swimming, water skiing, diving, and surfing commonly occur. Support of the use is determined by bacterial indicators (fecal coliform or *E. coli*).



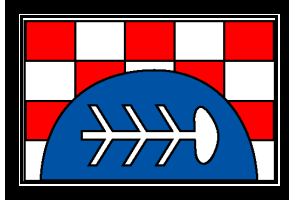
Noncontact Recreation

A noncontact recreation use is primarily assigned to water bodies where ship and barge traffic or other activities make contact recreation unsafe. Recreational activities such as boating that do not involve a significant risk of water ingestion are allowed. Support of the use is determined by bacterial indicators (fecal coliform or *E. coli*).



General Use

Water temperature, pH, chloride, sulfate, total dissolved solids and enterococci bacteria indicators are used to determine support of general water quality, rather than a specific use.



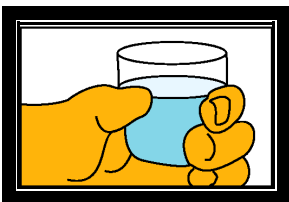
Fish Consumption

The fish consumption use is assigned to all water bodies to ensure that fish and shellfish is safe for human consumption. Support of the use is determined by human health criteria in water (to protect against bioaccumulation of toxic substances) and issuance of consumption advisories and aquatic life closures by the Texas Department of Health.



Oyster Waters

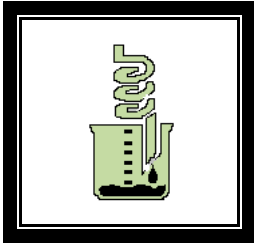
The oyster waters use is assigned to estuarine water bodies that are suitable for harvesting shellfish. Support of the use is determined from maps developed by the Texas Department of Health that depict the classification of shellfish growing areas.



Public Water Supply

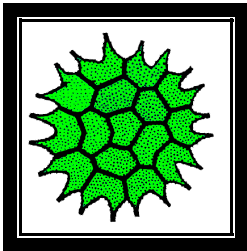
A public water supply use is assigned to all water bodies that are used as a supply for public drinking water. The use is designed to ensure that finished drinking water (after treatment) is safe for consumption. Primary organic substances in finished drinking water is the indicator used to determine support of the use.

Icons for Water Quality Concerns



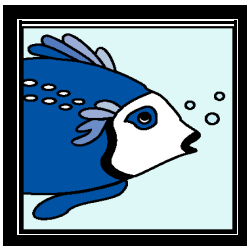
Nutrient Enrichment

Elevated concentrations of nutrients from point and nonpoint sources may contribute to excessive eutrophication in a water body. Nutrient enrichment concerns are determined by four indicators (ammonia and nitrite + nitrate nitrogen, orthophosphorus, and total phosphorus). Statewide 85th percentile concentrations by water body type are used to identify water bodies with nutrient enrichment concerns.



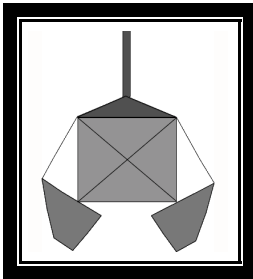
Chlorophyll a

Elevated concentrations of chlorophyll *a* signal potential problems associated with excessive algal growths. Algal blooms may occur in response to elevated nutrient concentrations. Statewide 85th percentile concentrations by water body type are used to identify water bodies with chlorophyll *a* concerns.



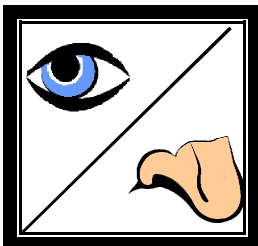
Fish Tissue

Elevated concentrations of metals and organic substances in fish tissue signal potential health risks to humans and other organisms that consume fish in their diets. Screening levels slightly below those used by the Texas Department of Health to establish consumption advisories are used to identify fish consumption concerns.



Sediment

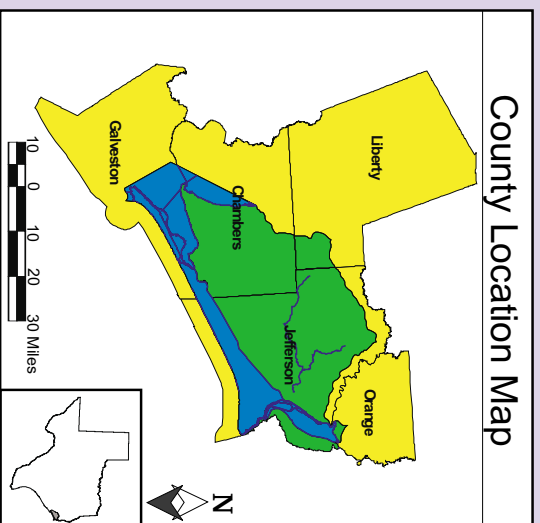
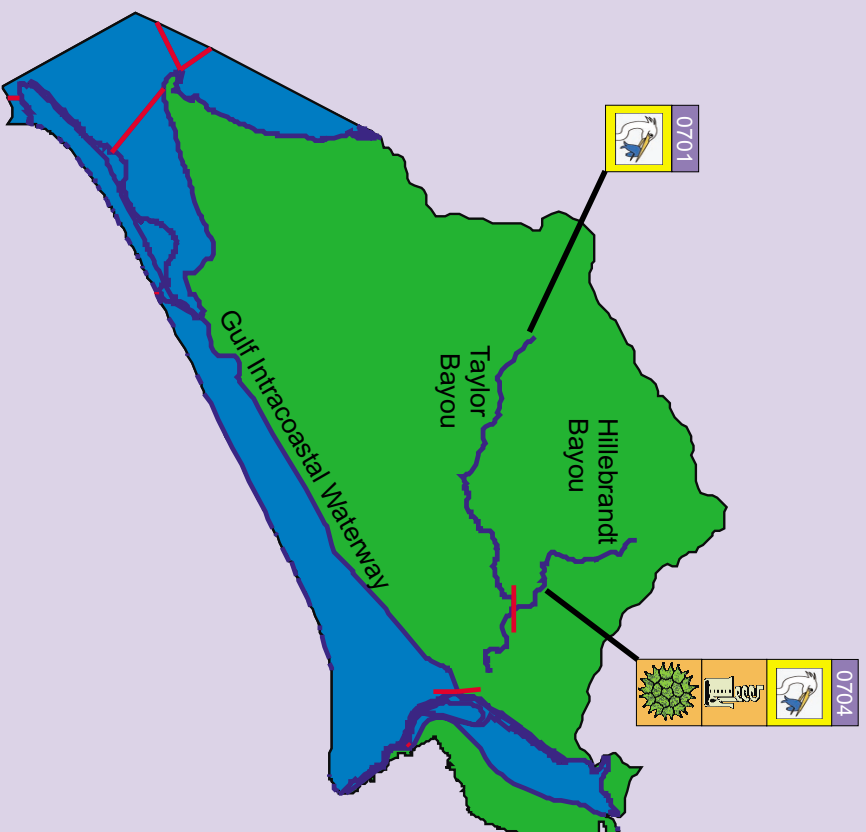
Elevated concentrations of metals and organic substances in sediment may contribute to water quality problems when they are re-suspended by wind activity and spring and fall overturn in deep reservoirs. Metals in sediment may be released into the water column when changes in pH occur near the sediment-water interface. Contaminated sediments may also affect small creatures such as worms, crustaceans, and insect larvae that live directly in the bottoms of water bodies. Statewide 85th percentile concentrations by water body type, threshold effects levels (TELS), and probable effect levels (PELS), are indicators used to identify sediment concerns.



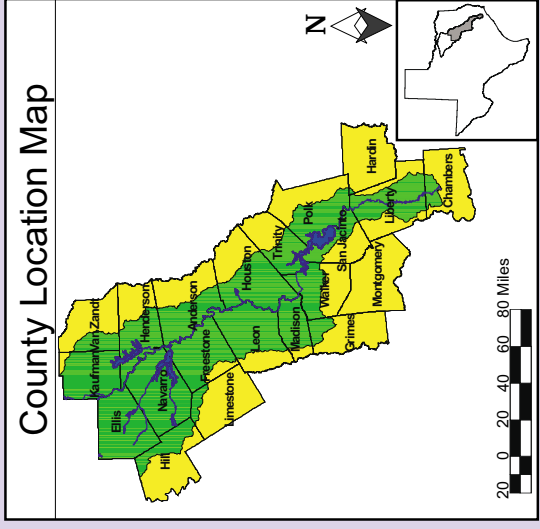
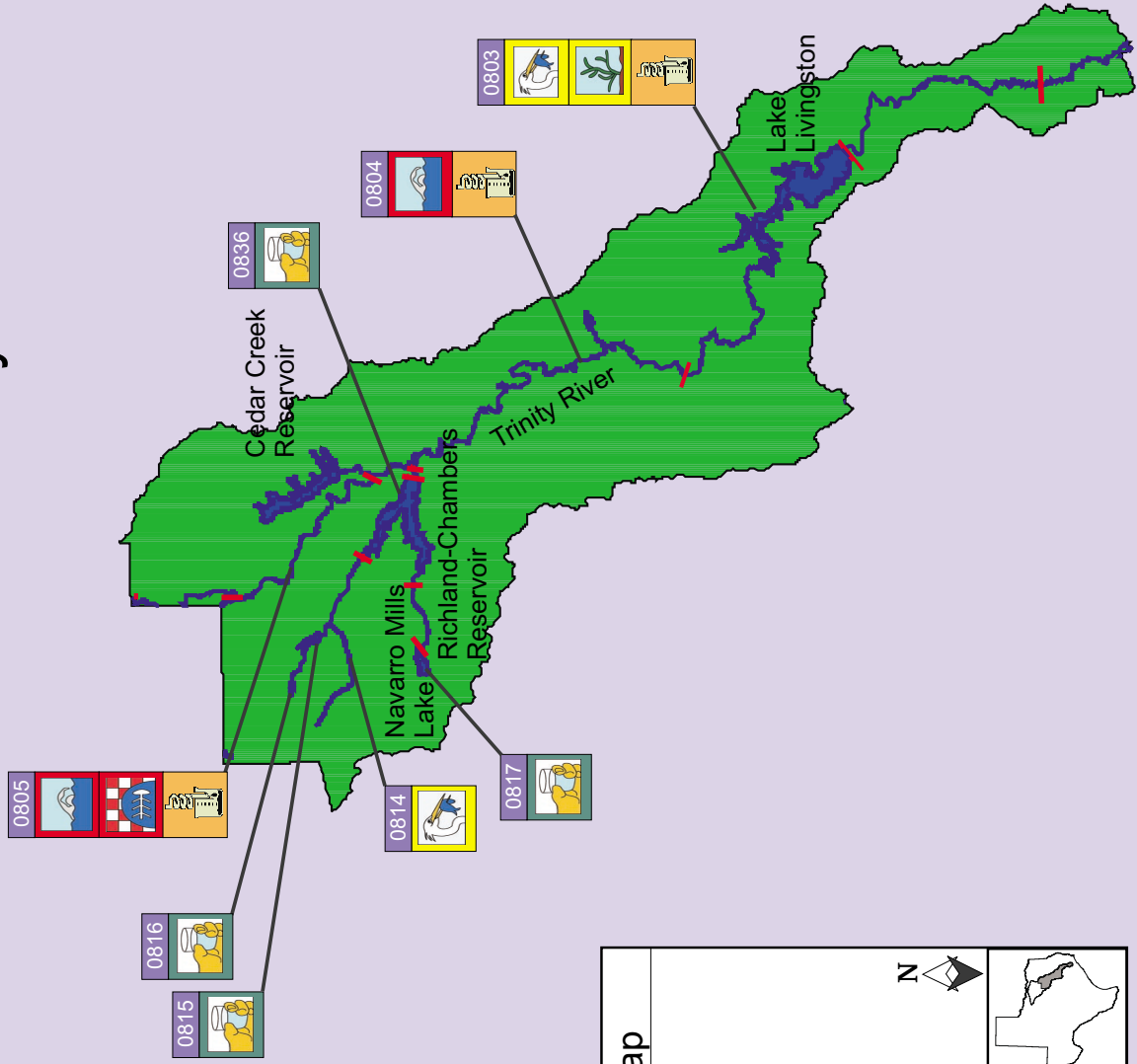
Narrative Criteria

Narrative criteria concerns are identified in water bodies where activities or substances impair taste, odor, color, and other aesthetic qualities.

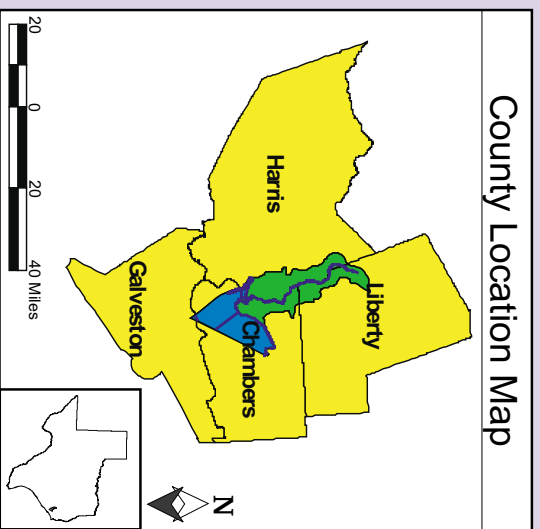
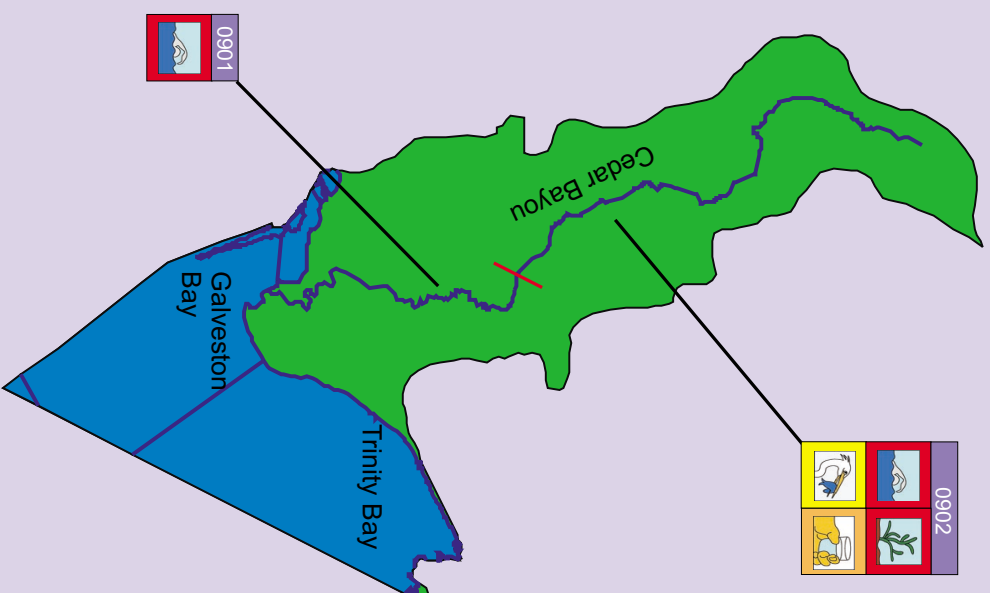
Neches-Trinity Coastal Basin Identified Water Quality Issues



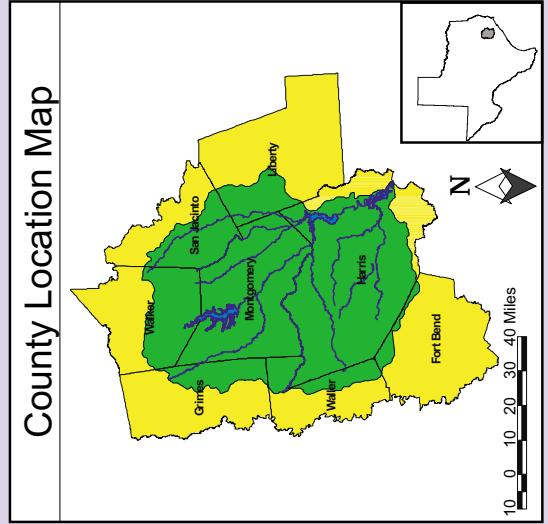
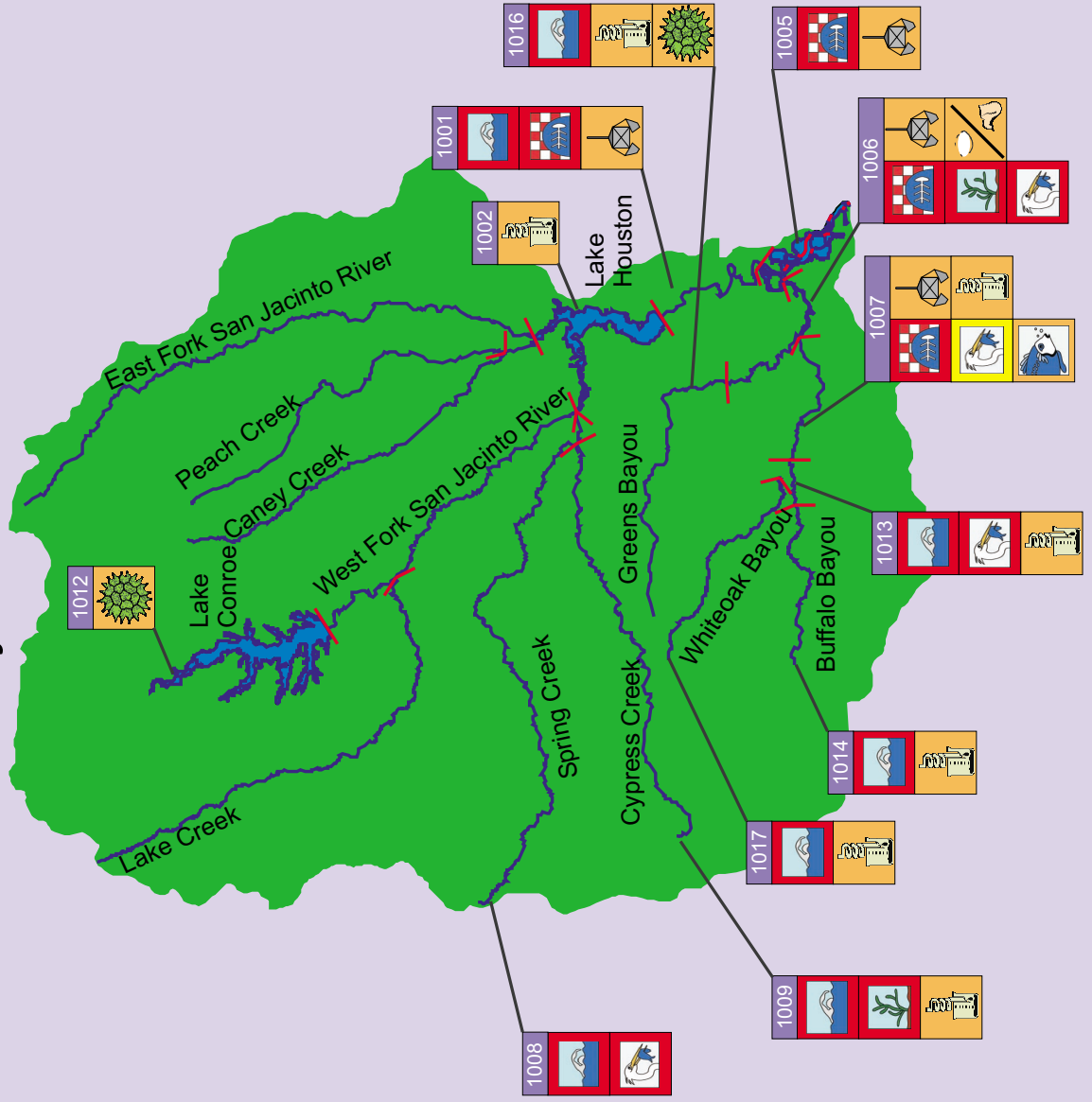
Lower Trinity River Basin Identified Water Quality Issues



Trinity-San Jacinto Coastal Basin Identified Water Quality Issues

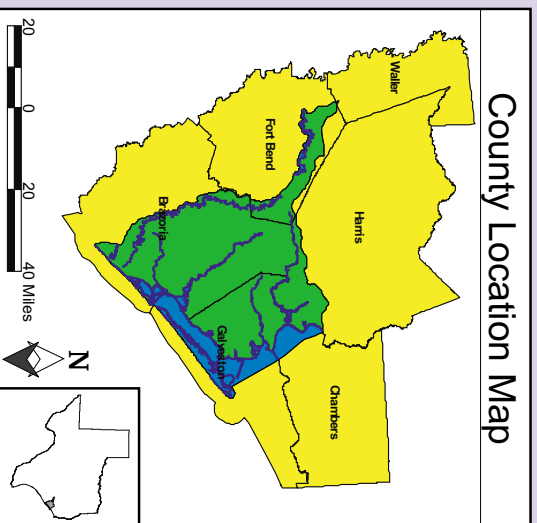
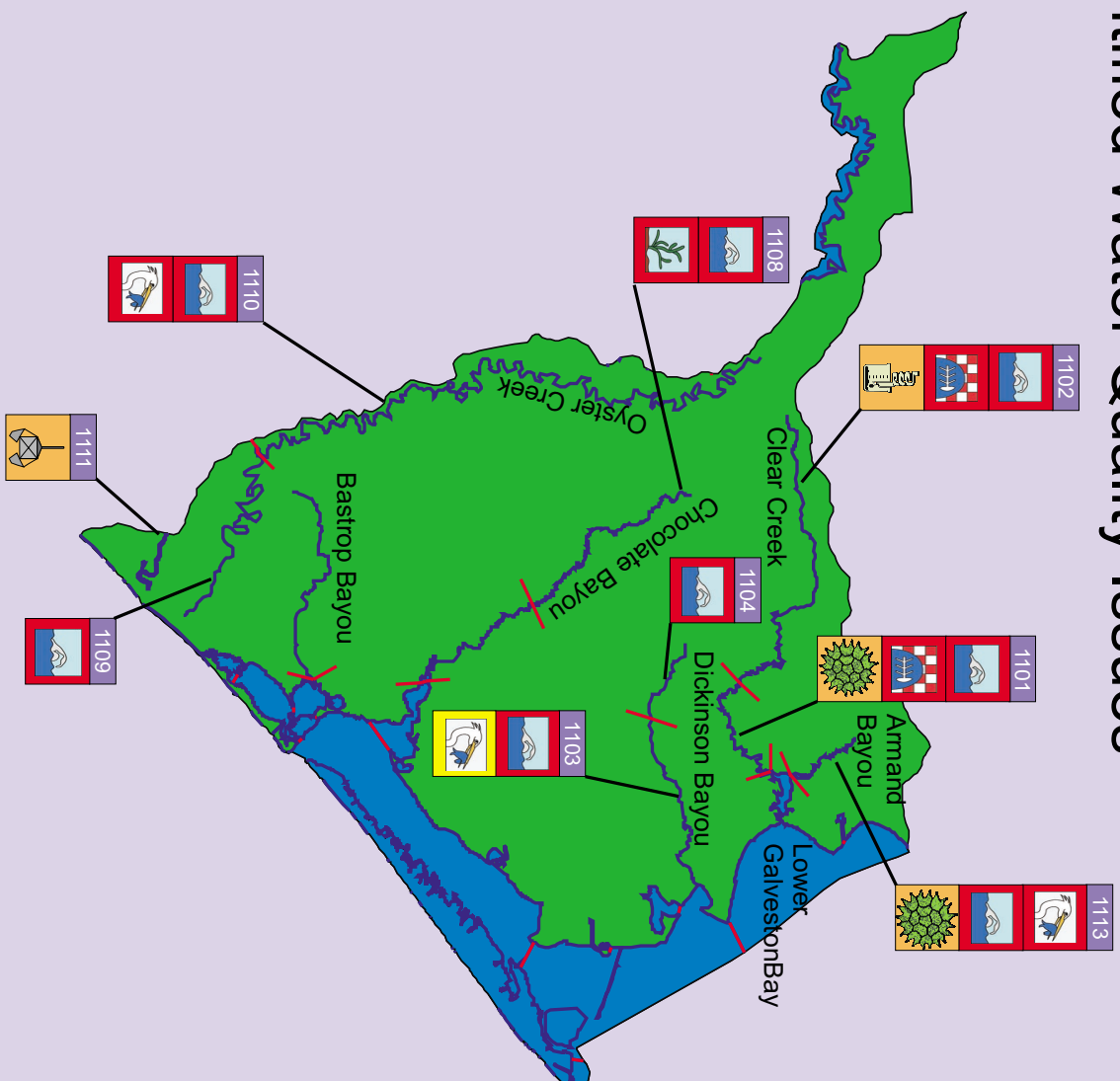


San Jacinto River Basin Identified Water Quality Issues

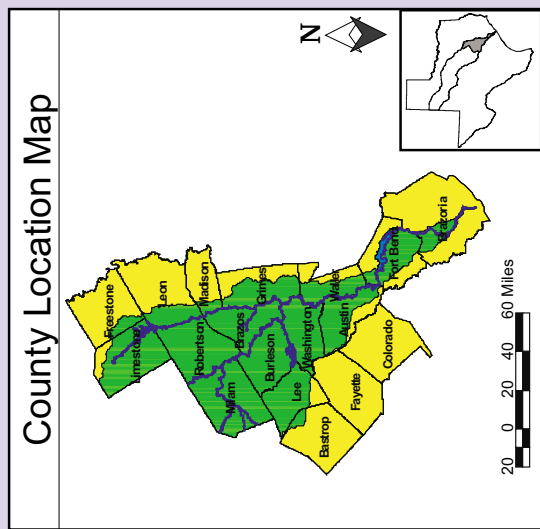
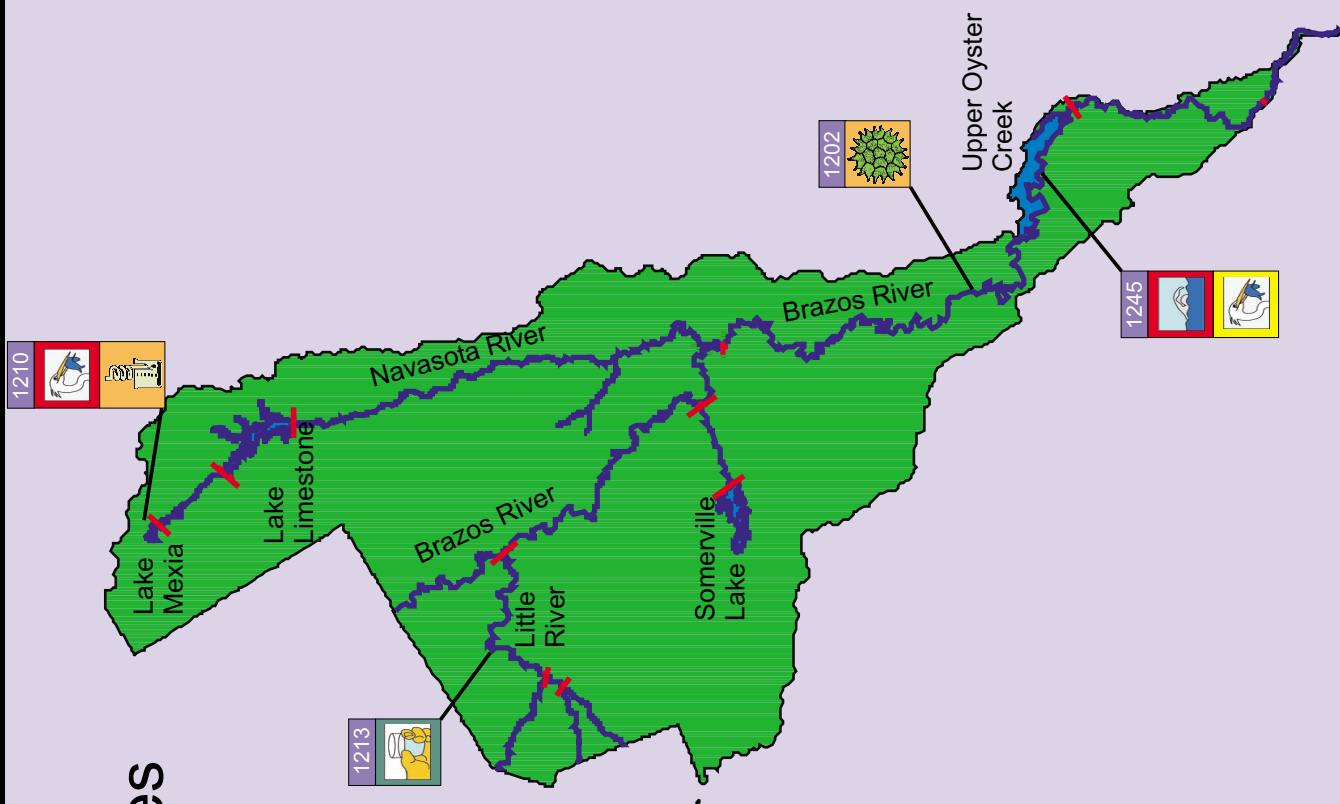


San Jacinto-Brazos Coastal Basin

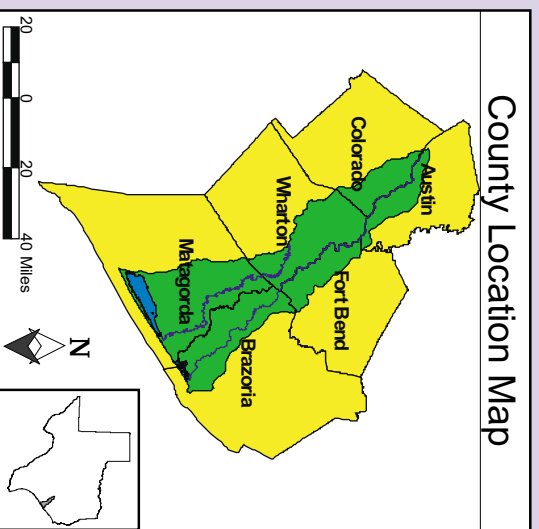
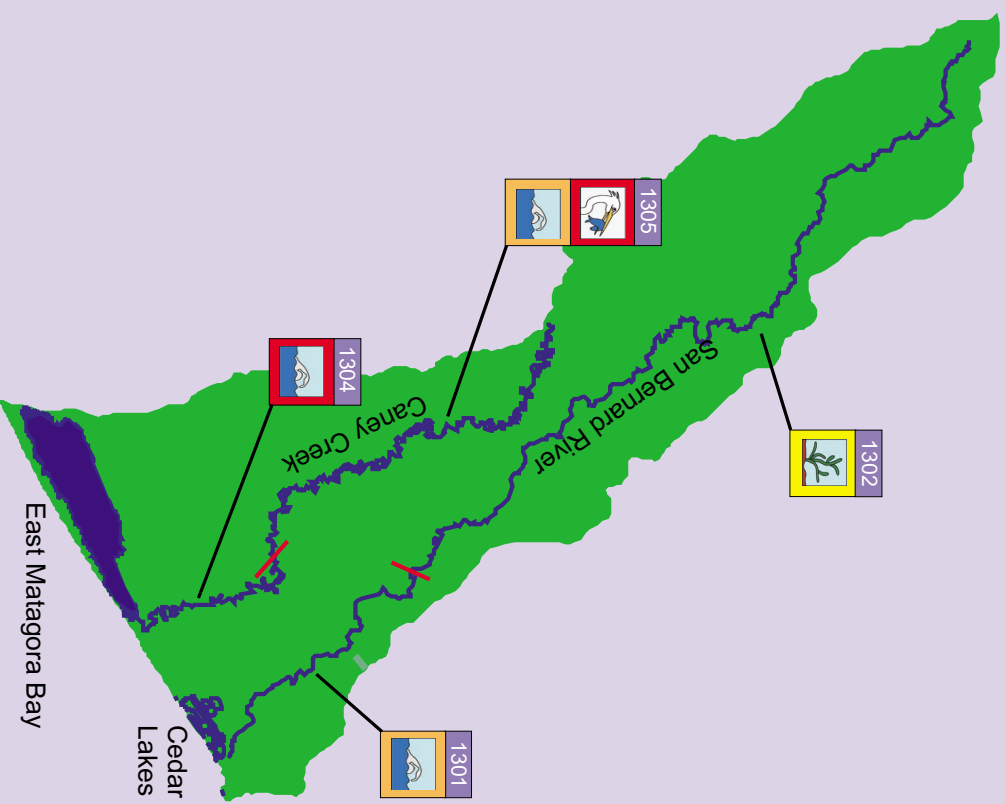
Identified Water Quality Issues



Lower Brazos River Basin Identified Water Quality Issues



Brazos-Colorado Coastal Basin Identified Water Quality Issues



Appendix 3G

Region H Recreational Use Information

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Region H
Table 3G-1: River Segments, Bays and Estuaries

Segment	Recreation ¹	Aquatic Life	Water Supply	Uses	Boating & Water Sports	Camping & Picnicking	Fishing	Hunting	Nature & Wildlife Viewing	Restrooms & Showers	Campsite Sewage	Visitor Center
Neches-Trinity Coastal Basin												
702 Intracoastal Waterway Tidal	Contact	High		Navigation								
Trinity River Basin												
801 Trinity River Tidal	Contact	High		B	+	+			+			
802 Trinity River below Lake Livingston	Noncontact	High	Public	B, Sp	+	+			+			
803 Lake Livingston	Contact	High	Public	E, Mun, In, Ir, Rec	+	+	+		+	r/s	D	
804 Trinity River above Lake Livingston	Noncontact	High		E, Sp	+	+			+			
Trinity-San Jacinto Coastal Basin												
901 Cedar Bayou Tidal	Noncontact			Sufficient	S/R+		+		+			
902 Cedar Bayou above Tidal	Noncontact	High	Public	Sufficient	S/R							
San Jacinto River Basin												
1001 San Jacinto River Tidal	Contact	High										
1002 Lake Houston	Contact	High	Public	Mun, In, Ir, Mi, Rec								
1003 East Fork San Jacinto River	Contact	High	Public		S/R+							
1004 West Fork San Jacinto River	Contact	High	Public		+	+						
1005 Houston Ship Channel/San Jacinto River Tidal	Noncontact	High		Sp		d+	-		+	r		+
1006 Houston Ship Channel Tidal	Noncontact		Industrial	Navigation, Sp		d+	-		+	r		+
1007 Houston Ship Channel/ Buffalo Bayou Tidal	Noncontact		Industrial	Navigation			-					
1008 Spring Creek	Noncontact	High	Public		S/R+							
1009 Cypress Creek	Noncontact	High	Public									
1010 Caney Creek	Contact	High	Public									
1011 Peach Creek	Noncontact	High	Public									
1012 Lake Conroe	Contact	High	Public	Mun, In, Mi								
1013 Buffalo Bayou Tidal	Noncontact	Intermediate			S/R+							
1014 Buffalo Bayou above Tidal	Noncontact	Limited			S/R+							
1015 Lake Creek	Contact	High	Public									
1016 Greens Bayou above Tidal	Noncontact	Limited										
1017 White Oak Bayou above Tidal	Noncontact	Limited										
San Jacinto-Brazos Coastal Basin												
1101 Clear Creek Tidal	Noncontact	High		Sufficient	S/R		-		+			
1102 Clear Creek above Tidal	Noncontact	High			S/R		-					
1103 Dickinson Bayou Tidal	Noncontact	High		Virgin Coastal Prairie					+			
1104 Dickinson Bayou above Tidal	Noncontact	Intermediate		Insufficient	S/R							
1105 Bastrop Bayou Tidal	Noncontact	High		Sufficient usually, B, Sp	S/R+		+	+	+			
1107 Chocolate Bayou Tidal	Contact	High			+							
1108 Chocolate Bayou above Tidal	Noncontact	High										
1109 Oyster Creek Tidal	Noncontact	High	Public	Sufficient	S/R							
1110 Oyster Creek above Tidal	Noncontact	High	Public		S/R							

Region H
Table 3G-1: River Segments, Bays and Estuaries

Segment	Special Features
Neches-Trinity Coastal Basin	(Anahuac National WMA, Moody National WMA, Candy Abscher WMA)
702 Intracoastal Waterway Tidal	
Trinity River Basin	(Keechi Creek WMA, Menard Creek Unit of Big Thicket National Preserve)
801 Trinity River Tidal	Extensive freshwater wetland habitat, Prime spawning area for striped bass restorator
802 Trinity River below Lake Livingston	Prime spawning area for striped bass restoration, Unique state holdings (Davis Hill State Park), USFWS
803 Lake Livingston	Paddletfish stocking area
804 Trinity River above Lake Livingston	Paddletfish stocking area, Unique state holding (Richland Creek WMA, Big Lake Bottom WMA)
Trinity-San Jacinto Coastal Basin	
901 Cedar Bayou Tidal	
902 Cedar Bayou above Tidal	
San Jacinto River Basin	(Sheldon WMA)
1001 San Jacinto River Tidal	
1002 Lake Houston	Lake Houston State Park
1003 East Fork San Jacinto River	Sam Houston National Forest, bottomland hardwood habitats
1004 West Fork San Jacinto River	
1005 Houston Ship Channel/San Jacinto River Tidal	Unique state holdings (San Jacinto State Park)
1006 Houston Ship Channel Tidal	Unique state holdings (San Jacinto State Park)
1007 Houston Ship Channel/ Buffalo Bayou Tidal	
1008 Spring Creek	bottomland hardwood habitats
1009 Cypress Creek	bottomland hardwood habitats
1010 Carney Creek	bottomland hardwood habitats
1011 Peach Creek	bottomland hardwood habitats
1012 Lake Conroe	
1013 Buffalo Bayou Tidal	
1014 Buffalo Bayou above Tidal	
1015 Lake Creek	
1016 Greens Bayou above Tidal	bottomland hardwood habitats Sabine Hwy 90'
1017 White Oak Bayou above Tidal	
San Jacinto-Brazos Coastal Basin	(Galveston Island State Park, Bryan Beach State Park, Christmas Bay State Park, Atkinson Island WMA, Christmas Bay Coastal Preserve)
1101 Clear Creek Tidal	
1102 Clear Creek above Tidal	
1103 Dickinson Bayou Tidal	
1104 Dickinson Bayou above Tidal	
1105 Bastrop Bayou Tidal	Extensive freshwater wetland habitat, Unique Federal Holdings (Brazoria National Wildlife Refuge)
1107 Chocolate Bayou Tidal	
1108 Chocolate Bayou above Tidal	
1109 Oyster Creek Tidal	
1110 Oyster Creek above Tidal	

Region H
Table 3G-1: River Segments, Bays and Estuaries

Segment	Recreation ¹	Aquatic Life	Water Supply	Uses	Boating & Water Sports	Camping & Picnicking	Fishing	Hunting	Nature & Wildlife Viewing	Restrooms & Showers	Campsite Sewage	Visitor Center
1111 Old Brazos River Channel Tidal	Contact	High										
1113 Armand Bayou Tidal	Noncontact	High		Unspoiled Vegetation, B	S/R				+			
Brazos River Basin												
1201 Brazos River Tidal	Contact	High	Public	B, E			-					
1202 Brazos River below Navasota River	Noncontact	High	Public	B, E, Sp		+	+		+	r/s	D	+
1209 Navasota River below Lake Limestone	Contact	High	Public	B	S/R				+			
1245 Upper Oyster Creek	Contact	Intermediate	Public									
1252 Lake Limestone	Contact	High	Public	Mun., In, Ir, Rec	+	+	+					
Brazos-Colorado Coastal Basin												
1301 San Bernard River Tidal	Noncontact	High		E, Rec, Sp			+	+				
1302 San Bernard River above Tidal	Contact	High		E, Rec, Sp					+			+
Bays and Estuaries												
2421 Upper Galveston Bay	Contact	High		Oyster Waters	+	+	-	+				
2422 Trinity Bay	Contact	High		Oyster Waters	+	+	+					
2423 East Bay	Contact	High		Oyster Waters	+		+					
2424 West Bay	Contact	High		Oyster Waters	+	+	+					
2425 Clear Lake	Noncontact	High			+	+						
2426 Tabbs Bay	Noncontact	High			+	+			+			
2427 San Jacinto Bay	Contact	High					-					
2428 Black Duck Bay	Contact	High					-					
2429 Scott Bay	Noncontact	High					-					
2430 Burnett Bay	Contact	High										
2431 Moses Lake	Contact	High			+				+			
2432 Chocolate Bay	Contact	High		Oyster Waters	+							
2433 Bastrop Bay/Oyster Lake	Contact	High		Oyster Waters	+							
2434 Christmas Bay	Contact	High		Oyster Waters	+	+	+					
2435 Drum Bay	Contact	High		Oyster Waters								
2436 Barbours Cut	Contact	High			+		-					
2437 Texas City Ship Channel	Noncontact	High			+		+		+			
2438 Bayport Channel	Noncontact	High			+		+					
2439 Lower Galveston Bay	Contact	High		Oyster Waters	+		+		+			
2442 Cedar Lakes	Contact	High		Oyster Waters			+	+	+			
B Biological Function	Mun	Municipal	Mi	Mining	day use only		+	+	+	+		
E Unique Communities	Ir	Irrigation	FH	fish hatchery	r restrooms		-	-	-	-		
Rec recreation	In	Industry	S/R	Seasonal and Restrictive	s showers							
Sp Acquisition/Mitigation/Governmental Open Space					D dump							
For the specific feature referred to by the symbols (B, E, and Sp) above see Sheet "Special Features"												

¹ The information used for this column was obtained from the Texas Commission for Environmental Quality "The State of Texas Water Quality Inventory: Surface Water Quality Monitoring Program" Volumes 1-4 published in December 1996, and the Texas Clean Rivers Program & TNRCC "Texas Water Quality: A Summary of River Basin Assessments" published in December 1996. The complete bibliography is attached after the tables.

Region H
Table 3G-1: River Segments, Bays and Estuaries

Segment	Special Features
1111 Old Brazos River Channel Tidal	
1113 Armand Bayou Tidal	Extensive freshwater wetland habitat. Armand Bayou Nature Center
Brazos River Basin	
	(Mill Creek-Unique community, rare gamagrass-switchgrass bottomland tallgrass prairie (Austin Co.))
1201 Brazos River Tidal	striped bass spawning migration, unique community, Live oak-Water oak-Pecan bottomlands
1202 Brazos River below Navasota River	striped bass spawning migration, unique community, Live oak-Water oak-Pecan bottomlands, unique state holdings (Brazos Bend State Park)
1209 Navasota River below Lake Limestone	striped bass spawning migration
1245 Upper Oyster Creek	
1252 Lake Limestone	
Brazos-Colorado Coastal Basin	
	(Peach Point WMA)
1301 San Bernard River Tidal	Unique community, Live Oak-Water Oak-Pecan bottomlands, Recreation, Unique Federal holdings (San Bernard NWR)
1302 San Bernard River above Tidal	Unique community, Live Oak-Water Oak-Pecan bottomlands, Recreation, Unique Federal holdings (Atwater Prairie Chicken NWR)
Bays and Estuaries	
2421 Upper Galveston Bay	
2422 Trinity Bay	
2423 East Bay	Anahuac National Wildlife Refuge
2424 West Bay	Brazoria National Wildlife Refuge
2425 Clear Lake	
2426 Tabbs Bay	
2427 San Jacinto Bay	
2428 Black Duck Bay	
2429 Scott Bay	
2430 Burnett Bay	
2431 Moses Lake	
2432 Chocolate Bay	
2433 Bastrop Bay/Oyster Lake	
2434 Christmas Bay	
2435 Drum Bay	
2436 Barbour's Cut	
2437 Texas City Ship Channel	
2438 Bayport Channel	
2439 Lower Galveston Bay	
2442 Cedar Lakes	

B Biological Function
 E Unique Communities
 Rec recreation
 Sp Acquisition/Mitigation/Governmental Open Space
 For the specific feature referred to by the symbols (E

¹ The information used for this column was obtained from Volumes 1-4 published in December 1996, and the complete bibliography is attached after the table.

Region H
Table 3G-2: Recreational Areas

Area	County	Boating & Water Sports	Camping & Picnicking	Fishing	Hunting	Nature & Wildlife Viewing	Restrooms & Showers	Campsite Sewage	Exhibit Center
Wildlife Refuges									
Anahuac NWR	Chambers	+		+	+		r		
Atwater Prairie Chicken NWR	in Colorado, but borders Austin					+			+
Brazoria NWR	Brazoria	+		+	+				
San Bernard NWR	Brazoria			+	+				
Trinity River NWR	Liberty					+			
Big Thicket National Preserve	Liberty, Polk					+	r		+
Lakes & Reservoirs									
Addicks Reservoir	Harris		d+	+		+	r		+
Anahuac Lake	Chambers								
Barker Reservoir	Harris		d+	+		+	r		
Brazoria Reservoir	Brazoria								
Eagle Nest Lake	Brazoria								
Galveston County Industrial Water Res.	Galveston								
HL&P Cooling Lake	Chambers								
Harris Reservoir	Brazoria								
Lake Charlotte	Chambers								
Lake Conroe	Montgomery, Walker	+	+	+					
Lake Houston	Harris								
Lake Limestone	Leon	+		+			r		
Lake Livingston	Polk, San Jacinto, Trinity, Walker	+	+	+		+	r/s	D	
Lewis Creek Reservoir	Montgomery								
Lost Lake	Chambers								
Manor Lake	Brazoria								
Moon Lake	Brazoria								
Mustang Lake East & Mustang Lake West	Brazoria								
Old River Lake	Chambers								
San Bernard Reservoir 1, 2, 3	Brazoria								
Sheldon Reservoir	Harris	+	d+	+					
Smithers Lake	Fort Bend								
Wallisville Reservoir	Chambers, Liberty	+		+	+	+			+
National Forests									
Davy Crockett National Forest	Trinity	+	+	+		+	r	D	+
Sam Houston National Forest	Montgomery, San Jacinto, Walker	+	+	+	+	+	r	D	+

**Region H
Table 3G-2: Recreational Areas**

Area	Uses / Special Features
Wildlife Refuges	
Anahuac NWR	geese, waterfowl, peregrine falcon, bald eagle, alligator, mottled duck, wood stork, least tern
Atwater Prairie Chicken NWR	atwater prairie chicken, bald eagle, white-tailed hawk, wood stork, migrating geese
Brazoria NWR	wintering waterfowl(snow geese, ducks), migratory birds, marsh and water birds(roseate spoonbills, great blue herons, white ibis, sandhill cranes)
San Bernard NWR	migrating waterfowl, snow geese
Trinity River NWR	wintering, migrating, and breeding waterfowl, wetland dependent wildlife
Big Thicket National Preserve	Central and Mississippi Migratory Flyways
Lakes & Reservoirs	
Addicks Reservoir	
Anahuac Lake	Ir, In, Mi
Barker Reservoir	
Brazoria Reservoir	In
Eagle Nest Lake	
Galveston County Industrial Water Res.	In, Mun
HL&P Cooling Lake	In
Harris Reservoir	In
Lake Charlotte	Cypress swamp
Lake Conroe	Mun, In, Mi
Lake Houston	Mun, In, Ir, Mi, Rec, Lake Houston State Park, Eisenhower park, Duessen Park
Lake Limestone	Mun, In, Ir
Lake Livingston	Mun, In, Ir
Lewis Creek Reservoir	In
Lost Lake	
Manor Lake	
Moon Lake	
Mustang Lake East & Mustang Lake West	Ir, In, Rec
Old River Lake	
San Bernard Reservoir 1, 2, 3	In
Sheldon Reservoir	Rec, FH
Smithers Lake	In
Wallisville Reservoir	Mun, In, Ir
National Forests	
	endangered species: red-cockaded woodpecker
	hunting: squirrel, deer, quail, dove, turkey, and waterfowl
Davy Crockett National Forest	Big Slough Wilderness Area, Ratcliff Lake Rec Area, Four C Rec Trail, additional riding trails
	endangered species: red-cockaded woodpecker
	hunting: white-tailed deer, feral hog, waterfowl, dove, migratory gamebirds, squirrel, quail, rabbits, predators, fur bearers, and frogs
Sam Houston National Forest	

Region H
Table 3G-2: Recreational Areas

Area	County	Boating & Water Sports	Camping & Picnicking	Fishing	Hunting	Nature & Wildlife Viewing	Restrooms & Showers	Campsite Sewage	Exhibit Center
Parks & Preserves									
Stephen F. Austin State Park	Austin		+	+	+	+	r/s	D+	+
Bryan Beach State Park	Brazoria	+	+	+					
Christmas Bay Coastal Preserve	Brazoria	+		+	+	+			
Christmas Bay State Park	Brazoria	+	+	+		+			
Peach Point Wildlife Mgmt. Area	Brazoria		+		+	+			
Varner-Hogg State Park	Brazoria		+				r		+
Candy Abshier WMA	Chambers		d			+			
Brazos Bend State Park	Fort Bend		+	+		+	r/s	D	+
Galveston Island State Park	Galveston	+	+	+		+	r/s	D	
Armand Bayou Coastal Preserve	Harris	+	d	+		+	r		+
Atkinson Island WMA	Harris	+	d		?	+			
Lake Houston State Park	Harris, Montgomery		+			+	r/s		
San Jacinto State Historical Park	Harris		d+	+		+	r		+
Sheldon Lake State Park and Wildlife Management Area	Harris	+	d+	+		+			
Keechi Wildlife Management Area	Leon	+	+	+	+	+			
W.G. Jones State Forest	Montgomery					+			
Lake Livingston State Park	Polk	+	+	+		+	r/s	D	
Alabama Creek WMA	Trinity		+	+	+	+	r		
Huntsville State Park	Walker	+	+	+		+	r/s	D	+
Rec Mun Ir	In Industry	d day use only		+					
Municipal	Mi Mining	r restrooms		-					
Irrigation	FH Fish hatchery	s showers							

To see the types of animals that live in certain parks, and which animals can be hunted refer to the sheet "Special Features"

The complete bibliography is attached after the tables.

**Region H
Table 3G-2: Recreational Areas**

Area	Uses / Special Features
Parks & Preserves	
Stephen F. Austin State Park	
Bryan Beach State Park	
Christmas Bay Coastal Preserve	migratory and resident waterfowl, shorebirds, finfish, designated a nursery area by the TPWD, unaltered habitat
Christmas Bay State Park	
Peach Point Wildlife Mgmt. Area	oak/hackberry motte and grassland typical of the Gulf Coast Prairies, hunting: waterfowl, rail, gallinule, snipe, and feral hogs
Varner-Hogg State Park	
Candy Abshtier WMA	spring migration - bird "fall out"
Brazos Bend State Park	
Galveston Island State Park	
Armand Bayou Coastal Preserve	migratory and resident waterfowl, American alligator, osprey, bluestem, little bluestem, designated a nursery area by the TPWD, unaltered habitat
Atkinson Island WMA	shore and wading birds, raccoons, and rattlesnakes
Lake Houston State Park	
San Jacinto State Historical Park	
Sheldon Lake State Park and Wildlife Management Area	last fresh water marsh within greater Houston city limits, deer, raccoon, mink, opossum, rabbit, alligator, bald eagles, ducks, geese, and other waterfowl, heron/egret rookeries, Florida bass, crappie, sunfish, and catfish
Keechi Wildlife Management Area	hunting: white-tailed deer, feral hog, squirrel, rabbit, hare, waterfowl, woodcock, gallinule and snipe
W.G. Jones State Forest	endangered species: red-cockaded woodpecker
Lake Livingston State Park	endangered species: red-cockaded woodpecker
Alabama Creek WMA	endangered species: red-cockaded woodpecker hunting: white-tailed deer, feral hog, waterfowl, dove, migratory gamebirds, squirrel, quail, rabbits, predators, fur bearers, and frogs
Huntsville State Park	bottomland hardwood habitats

Rec Recreation
Mun Municipal
Irr Irrigation
To see the types of animals that live in certain
The complete bibliography is attached after t

Appendix 3H

Current Water Supplies Available to
Region H by City and Category

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Appendix 3I

Current Water Supplies Available to
Region H by Wholesale Water Provider

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Region H
Table 3i: Current Water Supplies Available to WUGs in Region H by Wholesale Water Provider

WWP Name ¹	WWP Number	Source RWPG	Source WWP ²	WWP Number	Source ID	Source Name	Supply (acre-feet per year)					
							2010	2020	2030	2040	2050	2060
BAYTOWN AREA WATER AUTHORITY	15	H	CITY OF HOUSTON	396200	084H0	LIVINGSTON/WALLISVILLE SYSTEM	17,534	17,534	17,534	17,534	17,534	17,534
BRAZOS RIVER AUTHORITY	331	G	SELF SUPPLIED	331	120E0	BRAZOS RIVER AUTHORITY MAIN STEM SYSTEM	19,501	19,501	19,501	19,501	19,501	19,501
BRAZOSPORT WATER AUTHORITY	2000	H	SELF SUPPLIED	2000	3461205396	BRAZOS RIVER RUN-OF-RIVER	8,742	8,742	8,742	8,742	8,742	8,742
CHAMBERS LIBERTY COUNTIES NAVIGATIONAL DISTRICT	150	H	SELF SUPPLIED	150	3469064279B	TRINITY RIVER RUN-OF-RIVER	44,788	44,788	44,788	44,788	44,788	44,788
CHORWA	999902	H	CITY OF HOUSTON	396200	10030	HOUSTON LAKE/RESERVOIR	2,375	2,375	2,375	2,375	2,375	2,375
		H	SELF SUPPLIED	999902	10115	GULF COAST AQUIFER	3,246	1,800	1,287	1,287	1,287	1,287
CITY OF GALVESTON	316200	H	GULF COAST WATER AUTHORITY	325	3461205168	BRAZOS RIVER RUN-OF-RIVER	901	1,034	1,111	1,147	1,173	1,169
		H	SELF SUPPLIED	316200	084I5	BRAZOS RIVER RUN-OF-RIVER	24,217	24,217	24,217	24,217	24,217	24,217
					084I5	GULF COAST AQUIFER	1,610	1,900	1,571	1,552	1,539	1,539
					07915	GULF COAST AQUIFER	2,857	2,294	1,513	1,513	1,513	1,513
					084H0	LIVINGSTON/WALLISVILLE SYSTEM	644,906	677,937	711,220	750,090	798,573	798,573
		H	SELF SUPPLIED	396200	10030	HOUSTON LAKE/RESERVOIR	103,868	103,868	103,868	103,868	103,868	103,868
					10115	GULF COAST AQUIFER	83,396	80,950	82,127	82,127	82,127	82,127
					17015	GULF COAST AQUIFER	178	178	178	178	178	178
					3469064277	TRINITY RIVER RUN-OF-RIVER	33,000	33,000	33,000	33,000	33,000	33,000
		H	TRINITY RIVER AUTHORITY	187	084H0	LIVINGSTON/WALLISVILLE SYSTEM	22,403	22,403	22,403	22,403	22,403	22,403
		H	SELF SUPPLIED	410000	23615	GULF COAST AQUIFER	5,283	5,284	5,237	5,205	5,183	5,164
		H	CITY OF HOUSTON	396200	084H0	LIVINGSTON/WALLISVILLE SYSTEM	38,514	38,514	38,514	38,514	38,514	38,514
		H	SELF SUPPLIED	651900	10115	GULF COAST AQUIFER	2,047	2,047	2,047	2,047	2,047	2,047
CLEARLAKE CITY WATER AUTHORITY	159000	H	CITY OF HOUSTON	396200	084H0	LIVINGSTON/WALLISVILLE SYSTEM	26,876	26,876	26,876	26,876	26,876	26,876
FORT BEND CO. WCID 1	380	H	FORT BEND CO. WCID 1	380	3461105170	BRAZOS RIVER RUN-OF-RIVER	1,000	1,000	1,000	1,000	1,000	1,000
FORT BEND COUNTY WCID #2	821000	H	SELF SUPPLIED	821000	07915	SAN JACINTO-BRAZOS RIVER RUN-OF-RIVER	2,075	1,431	808	799	796	796
		H	GULF COAST WATER AUTHORITY	325	3461205168	BRAZOS RIVER RUN-OF-RIVER	6,384	6,384	6,384	6,384	6,384	6,384
					3461205171	BRAZOS RIVER RUN-OF-RIVER	195	195	195	195	195	195
		H	GULF COAST WATER AUTHORITY	325	3461205168	BRAZOS RIVER RUN-OF-RIVER	2,091	2,091	2,091	2,091	2,091	2,091
		H	SELF SUPPLIED	316325	084I5	BRAZOS RIVER RUN-OF-RIVER	1,141	1,141	1,141	1,141	1,141	1,141
					316325	GULF COAST AQUIFER	309	309	309	309	309	309
		H	GULF COAST WATER AUTHORITY	325	3461105557A	SAN JACINTO-BRAZOS RIVER RUN-OF-RIVER	13,541	13,541	13,541	13,541	13,541	13,541
					3461205168	BRAZOS RIVER RUN-OF-RIVER	58,773	58,773	58,773	58,773	58,773	58,773
		H	GULF COAST WATER AUTHORITY	325	3461205171	BRAZOS RIVER RUN-OF-RIVER	35,530	35,530	35,530	35,530	35,530	35,530
					346120532B	BRAZOS RIVER RUN-OF-RIVER	34,063	34,063	34,063	34,063	34,063	34,063
		G	BRAZOS RIVER AUTHORITY	331	120E0	BRAZOS RIVER AUTHORITY MAIN STEM SYSTEM	38,260	38,260	38,260	38,260	38,260	38,260
LA PORTE AREA WATER AUTHORITY	1095	H	CITY OF HOUSTON	396200	084H0	LIVINGSTON/WALLISVILLE SYSTEM	9,750	9,750	9,750	9,750	9,750	9,750
LOWER NECHES VALLEY AUTHORITY	140	I	SELF SUPPLIED	140	069A0	SAM RAYBURN-STEINHEGEN LAKE/RESERVOIR SYSTEM	63,886	63,886	63,886	64,007	64,083	64,177
MISSOURI CITY	999903	H	GULF COAST WATER AUTHORITY	325	3461205168	BRAZOS RIVER RUN-OF-RIVER	9,672	9,663	9,659	9,656	9,658	9,645
		H	SELF SUPPLIED	999903	07915	GULF COAST AQUIFER	15,862	13,713	9,340	9,340	9,340	9,340
		H	CITY OF HOUSTON	396200	084H0	LIVINGSTON/WALLISVILLE SYSTEM	0	21,434	21,434	21,434	21,434	21,434
		H	SELF SUPPLIED	999901	10115	GULF COAST AQUIFER	33,373	32,083	26,332	26,332	26,332	26,332
		H	SELF SUPPLIED	999901	10115	GULF COAST AQUIFER	1,636	470	311	311	311	311
		H	CITY OF HOUSTON	396200	10030	HOUSTON LAKE/RESERVOIR	34,714	34,714	34,714	34,714	34,714	34,714
		H	SELF SUPPLIED	999904	10115	GULF COAST AQUIFER	81,243	41,071	30,558	30,558	30,558	30,558
		H	CITY OF HOUSTON	396200	084H0	LIVINGSTON/WALLISVILLE SYSTEM	6,682	6,682	6,682	6,682	6,682	6,682
		H	SELF SUPPLIED	607473	10115	GULF COAST AQUIFER	1,673	1,652	1,650	1,647	1,645	1,645
		G	BRAZOS RIVER AUTHORITY	331	120E0	BRAZOS RIVER AUTHORITY MAIN STEM SYSTEM	83,000	83,000	83,000	83,000	83,000	83,000
					346903926	TRINITY-SAN JACINTO RIVER RUN-OF-RIVER	30,000	30,000	30,000	30,000	30,000	30,000
		H	NRG	398300	3461205320	BRAZOS RIVER RUN-OF-RIVER	12,000	12,000	12,000	12,000	12,000	12,000
					3461205325	BRAZOS RIVER RUN-OF-RIVER	28,711	28,711	28,711	28,711	28,711	28,711
		G	BRAZOS RIVER AUTHORITY	331	120E0	BRAZOS RIVER AUTHORITY MAIN STEM SYSTEM	7,500	7,500	7,500	7,500	7,500	7,500
		H	SELF SUPPLIED	999905	07915	GULF COAST AQUIFER	7,408	6,111	4,279	4,279	4,279	4,279
					10060	CONROE LAKE/RESERVOIR	21,698	21,698	21,698	21,698	21,698	21,698
		H	SELF SUPPLIED	240	17015	GULF COAST AQUIFER	11,303	11,294	11,279	11,041	8,974	7,359
					3410805271B	TRINITY RIVER RUN-OF-RIVER	31,223	31,223	31,223	31,223	31,223	31,223
		H	GULF COAST WATER AUTHORITY	325	3461004964	SAN JACINTO RIVER RUN-OF-RIVER	37,627	37,627	37,627	37,627	37,627	37,627
		H	SELF SUPPLIED	999906	07915	BRAZOS RIVER RUN-OF-RIVER	12,963	12,963	12,963	12,963	12,963	12,963
		H	SELF SUPPLIED	237200	346120528B	GULF COAST AQUIFER	20,281	17,020	9,974	9,927	9,827	9,027
		H	SELF SUPPLIED	187	084H0	BRAZOS RIVER RUN-OF-RIVER	13,475	13,475	13,475	13,475	13,475	13,475
		H	SELF SUPPLIED	187	084H0	LIVINGSTON/WALLISVILLE SYSTEM	41,016	41,009	41,009	41,012	41,017	41,021
		H	CITY OF HOUSTON	396200	084H0	LIVINGSTON/WALLISVILLE SYSTEM	20,437	20,437	20,437	20,437	20,437	20,437
		H	SELF SUPPLIED	999907	07915	GULF COAST AQUIFER	3,208	2,640	1,740	1,740	1,740	1,740
					10115	GULF COAST AQUIFER	42,047	20,324	14,781	14,781	14,781	14,781

Notes:

- 1) WWPs with contracts to supply wholesale water directly to WUGs
- 2) WWPs with contracts to supply another WWP

Appendix 3J

Current Surface Water Supplies by Category of Use
by Basin by Wholesale Water Provider

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Table 3J. Current Surface Water Supply by Category of Water Use by Basin by Wholesale Water Provider

WPP Name	WPP Number	Source ID	Source Name	Source County	Source Basin	Use	Year 2010	Year 2020	Year 2030	Year 2040	Year 2050
BAY COUNTY AREA WATER AUTHORITY	15	08400	LIVINGSTON-WALLISVILLE SYSTEM	RESERVOIR	TRINITY	MUNICIPAL	17,524	17,524	17,524	17,524	17,524
BRAZOS RIVER AUTHORITY	331	12060	BRAZOS RIVER AUTHORITY MAIN STEM SYSTEM	RESERVOIR	BRAZOS	MANUFACTURING	16,400	16,400	16,400	16,400	16,400
BRAZOSPORT WATER AUTHORITY	2000	3461205366	BRAZOS RIVER RUN-OFF-RIVER	BRAZORIA	BRAZOS	MUNICIPAL	3,101	3,101	3,101	3,101	3,101
CHAMBERS LIBERTY COUNTIES NAVIGATIONAL DISTRICT	150	34608042798	TRINITY RIVER RUN-OFF-RIVER	CHAMBERS	TRINITY	MANUFACTURING	8,238	8,238	8,238	8,238	8,238
CITY OF GALVESTON	999002	08415	TRINITY RIVER RUN-OFF-RIVER	RESERVOIR	TRINITY	REGULATION	40,000	40,000	40,000	40,000	40,000
		08415	HOUSTON LAKE RESERVOIR	RESERVOIR	SAN JACINTO	MUNICIPAL	4,788	4,788	4,788	4,788	4,788
		08415	GULF COAST AQUIFER	RESERVOIR	SAN JACINTO	MUNICIPAL	3,246	3,246	3,246	3,246	3,246
		316200	GALVESTON-WALLISVILLE SYSTEM	RESERVOIR	SAN JACINTO-BRAZOS	MUNICIPAL	18,110	18,110	18,110	18,110	18,110
		3461205168	BRAZOS RIVER RUN-OFF-RIVER	RESERVOIR	BRAZOS	MUNICIPAL	3,011	3,011	3,011	3,011	3,011
		3461205171	TRINITY RIVER RUN-OFF-RIVER	RESERVOIR	TRINITY	MUNICIPAL	2,104	2,104	2,104	2,104	2,104
		07915	GULF COAST AQUIFER	RESERVOIR	SAN JACINTO-BRAZOS	MUNICIPAL	2,827	2,824	2,824	2,824	2,824
		08400	LIVINGSTON-WALLISVILLE SYSTEM	RESERVOIR	TRINITY	MANUFACTURING	289,967	289,967	289,967	289,967	289,967
		386200	HOUSTON LAKE RESERVOIR	RESERVOIR	SAN JACINTO	STEAM ELECTRIC POWER	84,426	84,426	84,426	84,426	84,426
		10115	GULF COAST AQUIFER	RESERVOIR	SAN JACINTO	MUNICIPAL	14,369	14,369	14,369	14,369	14,369
CITY OF HOUSTON	17015	10115	GULF COAST AQUIFER	HARRIS	SAN JACINTO-BRAZOS	MUNICIPAL	83,239	83,239	81,980	81,980	81,980
	3460804277	10115	TRINITY RIVER RUN-OFF-RIVER	LIBERTY	SAN JACINTO	MUNICIPAL	178	178	178	178	178
	08400	10115	LIVINGSTON-WALLISVILLE SYSTEM	RESERVOIR	TRINITY	REGULATION	33,000	33,000	33,000	33,000	33,000
	28615	08400	GULF COAST AQUIFER	WALKER	SAN JACINTO	MUNICIPAL	4,500	4,500	4,500	4,500	4,500
	08400	08400	LIVINGSTON-WALLISVILLE SYSTEM	RESERVOIR	TRINITY	MANUFACTURING	6,867	6,867	6,867	6,867	6,867
	10115	08400	GULF COAST AQUIFER	HARRIS	SAN JACINTO	MUNICIPAL	3,559	3,559	3,559	3,559	3,559
	159000	08400	LIVINGSTON-WALLISVILLE SYSTEM	RESERVOIR	TRINITY	MANUFACTURING	448	448	448	448	448
	350	3461105170	BRAZOS RIVER RUN-OFF-RIVER	RESERVOIR	SAN JACINTO-BRAZOS	MANUFACTURING	2,162	2,162	2,162	2,162	2,162
	821000	07915	GULF COAST AQUIFER	FORT BEND	SAN JACINTO	MUNICIPAL	1,887	1,887	1,887	1,887	1,887
	316325	08415	GALVESTON-WALLISVILLE SYSTEM	FORT BEND	BRAZOS	MUNICIPAL	308	308	308	308	308
GULF COAST WATER AUTHORITY	325	3461205168	BRAZOS RIVER RUN-OFF-RIVER	FORT BEND	BRAZOS	MANUFACTURING	2,091	2,091	2,091	2,091	2,091
		3461205171	TRINITY RIVER RUN-OFF-RIVER	FORT BEND	BRAZOS	MANUFACTURING	1,141	1,141	1,141	1,141	1,141
		3461205328	BRAZOS RIVER RUN-OFF-RIVER	FORT BEND	BRAZOS	MANUFACTURING	38,210	38,210	38,210	38,210	38,210
		08400	LIVINGSTON-WALLISVILLE SYSTEM	RESERVOIR	TRINITY	MANUFACTURING	13,541	13,541	13,541	13,541	13,541
		140	3461105374	BRAZOS RIVER RUN-OFF-RIVER	BRAZORIA	SAN JACINTO-BRAZOS	40,012	40,012	40,012	40,012	40,012
		999003	07915	GULF COAST AQUIFER	FORT BEND	BRAZOS	517	517	517	517	517
		999001	08400	LIVINGSTON-WALLISVILLE SYSTEM	FORT BEND	BRAZOS	15,655	15,655	15,655	15,655	15,655
		999004	08400	HOUSTON LAKE RESERVOIR	FORT BEND	BRAZOS	10,204	10,204	10,204	10,204	10,204
		607473	08400	GULF COAST AQUIFER	FORT BEND	BRAZOS	23,148	23,148	23,148	23,148	23,148
		398300	3461205168	BRAZOS RIVER RUN-OFF-RIVER	FORT BEND	BRAZOS	1,427	1,427	1,427	1,427	1,427
LA PORTE AREA WATER AUTHORITY	1095	08400	LIVINGSTON-WALLISVILLE SYSTEM	RESERVOIR	TRINITY	MANUFACTURING	9,409	9,409	9,409	9,409	9,409
	140	06040	SAM PAT BURNETT WILSON LAKE RESERVOIR SYSTEM	RESERVOIR	NICHES	MANUFACTURING	6,163	6,163	6,246	6,307	6,363
		999003	07915	GULF COAST AQUIFER	FORT BEND	SAN JACINTO	3,815	3,815	3,815	3,815	3,815
		999001	08400	LIVINGSTON-WALLISVILLE SYSTEM	FORT BEND	SAN JACINTO-BRAZOS	11,664	10,125	9,812	9,812	9,812
		999004	08400	HOUSTON LAKE RESERVOIR	FORT BEND	BRAZOS	9,672	9,663	9,659	9,656	9,656
		607473	07915	GULF COAST AQUIFER	FORT BEND	SAN JACINTO	18,936	17,740	12,151	12,151	12,151
		999004	08400	LIVINGSTON-WALLISVILLE SYSTEM	RESERVOIR	SAN JACINTO-BRAZOS	12,739	12,739	12,739	12,739	12,739
		999004	10300	HOUSTON LAKE RESERVOIR	RESERVOIR	TRINITY	1,434	1,434	21,434	21,434	21,434
		607473	08400	GULF COAST AQUIFER	RESERVOIR	SAN JACINTO	34,714	34,714	34,714	34,714	34,714
		607473	08400	LIVINGSTON-WALLISVILLE SYSTEM	RESERVOIR	TRINITY	81,243	41,971	30,558	30,558	30,558
NORTH CHANNEL WATER AUTHORITY	240	10115	GULF COAST AQUIFER	RESERVOIR	TRINITY	MANUFACTURING	5,536	5,536	5,536	5,536	5,536
		3461205168	BRAZOS RIVER RUN-OFF-RIVER	RESERVOIR	SAN JACINTO	MANUFACTURING	1,673	1,662	1,650	1,641	1,645
		3461205300	TRINITY RIVER RUN-OFF-RIVER	RESERVOIR	BRAZOS	STEAM ELECTRIC POWER	83,000	83,000	83,000	83,000	83,000
		3461205325	BRAZOS RIVER RUN-OFF-RIVER	RESERVOIR	TRINITY	STEAM ELECTRIC POWER	12,000	12,000	12,000	12,000	12,000
		999005	10300	BRAZOS RIVER AUTHORITY MAIN STEM SYSTEM	RESERVOIR	BRAZOS	7,038	7,038	7,038	7,038	7,038
		999005	10300	BRAZOS RIVER AUTHORITY MAIN STEM SYSTEM	RESERVOIR	BRAZOS	880	880	880	880	880
		999005	10300	CONROE LAKE RESERVOIR	RESERVOIR	SAN JACINTO	880	880	880	880	880
		240	34108050718	TRINITY RIVER RUN-OFF-RIVER	LIBERTY	SAN JACINTO	11,303	11,284	11,278	11,041	8,974
		999006	07915	GULF COAST AQUIFER	FORT BEND	SAN JACINTO-BRAZOS	5,923	5,923	5,923	5,923	5,923
		237200	3461205328	BRAZOS RIVER RUN-OFF-RIVER	BRAZORIA	BRAZOS	12,263	12,263	12,263	12,263	12,263
SUGAR LAND	187	08400	LIVINGSTON-WALLISVILLE SYSTEM	RESERVOIR	TRINITY	MANUFACTURING	137,475	137,475	137,475	137,475	137,475
		999007	07915	GULF COAST AQUIFER	FORT BEND	SAN JACINTO	32,487	32,487	32,487	32,487	32,487
		999007	10115	LIVINGSTON-WALLISVILLE SYSTEM	RESERVOIR	SAN JACINTO	2,640	2,640	1,740	1,740	1,740
			10115	GULF COAST AQUIFER	HARRIS	SAN JACINTO	42,417	20,324	14,781	14,781	14,781
			10115	GULF COAST AQUIFER	HARRIS	SAN JACINTO	42,417	20,324	14,781	14,781	14,781

