Freese and Nichols, Inc. Engineers Environmental Scientists Architects

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June 11, 2008

Ms. Rima Petrossian, P.G., Manager
Groundwater Technical Assistance
Texas Water Development Board
P.O. Box 13231
Austin, Texas 78711-3231

Re: Adopted Groundwater Management Plan
Corpus Christi Aquifer Storage Recovery Groundwater Conservation District
FNI COR08162

Dear Ms. Petrossian:

On behalf of the Corpus Christi Aquifer Storage Recovery Groundwater Conservation District (District), Freese and Nichols, Inc. herewith transmits the subject adopted groundwater management plan for review by the Texas Water Development Board (TWDB).

The District has, following adoption of the plan, and prior to this submittal of the adopted plan to the TWDB, provided copies of the adopted plan to other conservation districts and surface water supply entities as part of the District's ongoing coordination of regional water supply issues.

For your convenience, the adopted plan is organized to follow TWDB's groundwater management plan checklist. We trust that you will find the plan administratively complete.

Please direct questions or comments to me at (512) 617-3144 or jbh@freese.com, or Mr. Stefan Schuster at (512) 821-2765 or sschuster@dbstephens.com.

Sincerely,

Jonathan B. Howard, P.E.
Project Manager

cc: Mr. Oscar Martinez, President

CITY OF CORPUS CHRISTI

AQUIFER STORAGE AND RECOVERY CONSERVATION DISTRICT (CCASRCD) MANAGEMENT PLAN

Adopted on June 5, 2008
Texas Water Development Board on _____

City of Corpus Christi
1201 Leopard Street
Corpus Christi, TX 78401-2825

(361) 826-2849
(361) 826-3200 (Fax)

June 2008

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District's Mission

The Corpus Christi Aquifer Storage and Recovery Conservation District (District) is committed to manage and protect the groundwater resources of the District, including those injected into the ground for storage and later use. The District is committed to maintaining a sustainable, adequate, reliable, cost effective and high quality source of groundwater to promote the vitality, economy and environment of the District. The District will work with and for the citizens of the District and cooperate with other local, regional and state agencies involved in the study and management of groundwater resources. The District shall take no action without a full consideration of the groundwater needs of the citizens of the District.

Purpose of the Management Plan

In 1997, the 75th Texas Legislature established a statewide comprehensive regional water planning initiative with the enactment of Senate Bill 1 (SB1). SB1 included amendments to Chapter 36 of the Texas Water Code that require groundwater conservation districts to develop a groundwater management plan that shall be submitted to the Texas Water Development Board (TWDB) for approval as administratively complete. The groundwater management plan (GMP) is required to contain estimates of groundwater availability within the District, details of how the District would manage groundwater and management goals for the District. SB 1 provides for review and approval of the GMPs by the Texas Water Development Board (TWDB). In 2001, the 77th Texas Legislature further clarified the water planning and management provisions of SB1 with the enactment of Senate Bill 2 (SB2) and HB 1763.

The administrative requirements of Chapter 36 of the Texas Water Code related to groundwater management plan development are specified in 31 Texas Administrative Code, Chapter 356. This plan has been prepared to fulfill all requirements for groundwater management plans required by SB1, SB2, Chapter 36 Texas Water Code, and 31 Texas Administrative Code Chapter 356.

Time Period of the Management Plan

This plan shall be in effect for a period of ten years from the date of approval by TWDB, unless a new or amended management plan is adopted by the District Board of Directors and certified by TWDB.

Statement of Guiding Principles

The District is dedicated to protecting groundwater supplies within the District, developing and maintaining an aquifer storage and recovery program, providing the most efficient use of groundwater resources to supplement existing supplies, while controlling and preventing waste of groundwater.

The primary objective of the District is to achieve the purpose for which the District was created, e.g., to facilitate the operation of aquifer storage and recovery operations by the City of Corpus Christi to enhance its water supply, treatment, and distribution operations for the benefit of its retail and wholesale customers, both inside the city limits and within the Certificate of Convenience and Necessity (CCN) service area and outside the City to its outside city limits (OCL) treated and raw water customers. The major concern with the proposed aquifer storage and recovery operations is to ensure that once the aquifer storage and recovery well fields are established, others do not drill wells and tap into the waters that have been injected by the City into the aquifers for later recovery by the City.

Another objective of the District is to use its well permitting authority to enhance the City's ability to ensure that there is a safe water supply for its residents.

The City currently requires new developments within one mile of an existing water distribution main to tie into the potable water distribution systems operated by the City or one of the two water control and improvement district, which provide potable water in parts of the City. The City does permit the use of well water for irrigation purposes.

The City is also considering the establishment of municipal setting designations to facilitate redevelopment of areas where the aquifers have been contaminated by pollutants.

Authority of the District

The District derives its authority to manage groundwater within the District by virtue of the powers granted and authorized in the District's enabling act, SB 1831 of the 79th Texas Legislature. (Appendix A), as codified in Chapter 8811, Special District Local Laws Code to include the District. The District, acting under authority of the enabling legislation, assumes all the rights and responsibilities of a groundwater conservation district specified in Chapter 36 of the Texas Water Code. Upon adoption of the District rules by the District Board of Directors in a public meeting, the authority to manage the use of

groundwater in the District will be governed at all times by the due process specified in the District rules. (Appendix E).

District Board of Directors and Committees

The District Board of Directors is composed of 5 members initially elected to staggered 2- and 4-year terms. Currently, all directors serve 4-year terms. All directors are appointed by the Corpus Christi City Council. The District's current Board of Directors is presented in Table 1. The Board of Directors hold regular meetings at City Hall at 1201 Leopard Street, Corpus Christi, Texas on a quarterly basis, unless otherwise posted. All meetings of the District's Board of Directors are public meetings noticed and held in accordance with all public meeting requirements. The Board of Directors meetings are posted in each county along with other items of interest by the District.

Corpus Christi ASR Conservation District Creation and History

The District was created in 2005 by the 79th Texas Legislature enactment of SB 1831, Section 1, Subtitle H, Title 6. Special District Local Laws Code was amended by adding Chapter 8811 to include the District.

The District is located in Aransas, Kleberg, Nueces, and San Patricio Counties, Texas, as shown in Figures 1 & 2. The initial boundaries of the district (i.e., CCASRCD) are coextensive with the city limits of the City of Corpus Christi and include: in San Patricio County, property owned by or under contract to the City of Corpus Christi and bounded on the west by Interstate Highway 37 and U.S. Highway 77, on the north by the metropolitan planning organization (i.e., Corpus Christi Metropolitan Planning Organization) boundary, on the east by County Road 2849, and on the south by the city limits of the City of Corpus Christi.

Current District Board of Directors	
Chairman	Mr. Oscar Martinez
Vice Chairman	Mr. Angel Escobar
Secretary	Mr. Fred Segundo
Member	Mrs. Margie Rose
Member	Mr. Max Castaneda
General Manager	Mr. George “Skip” Noe

Source: City of Corpus Christi, 2008

Table 1. District Current Board of Directors

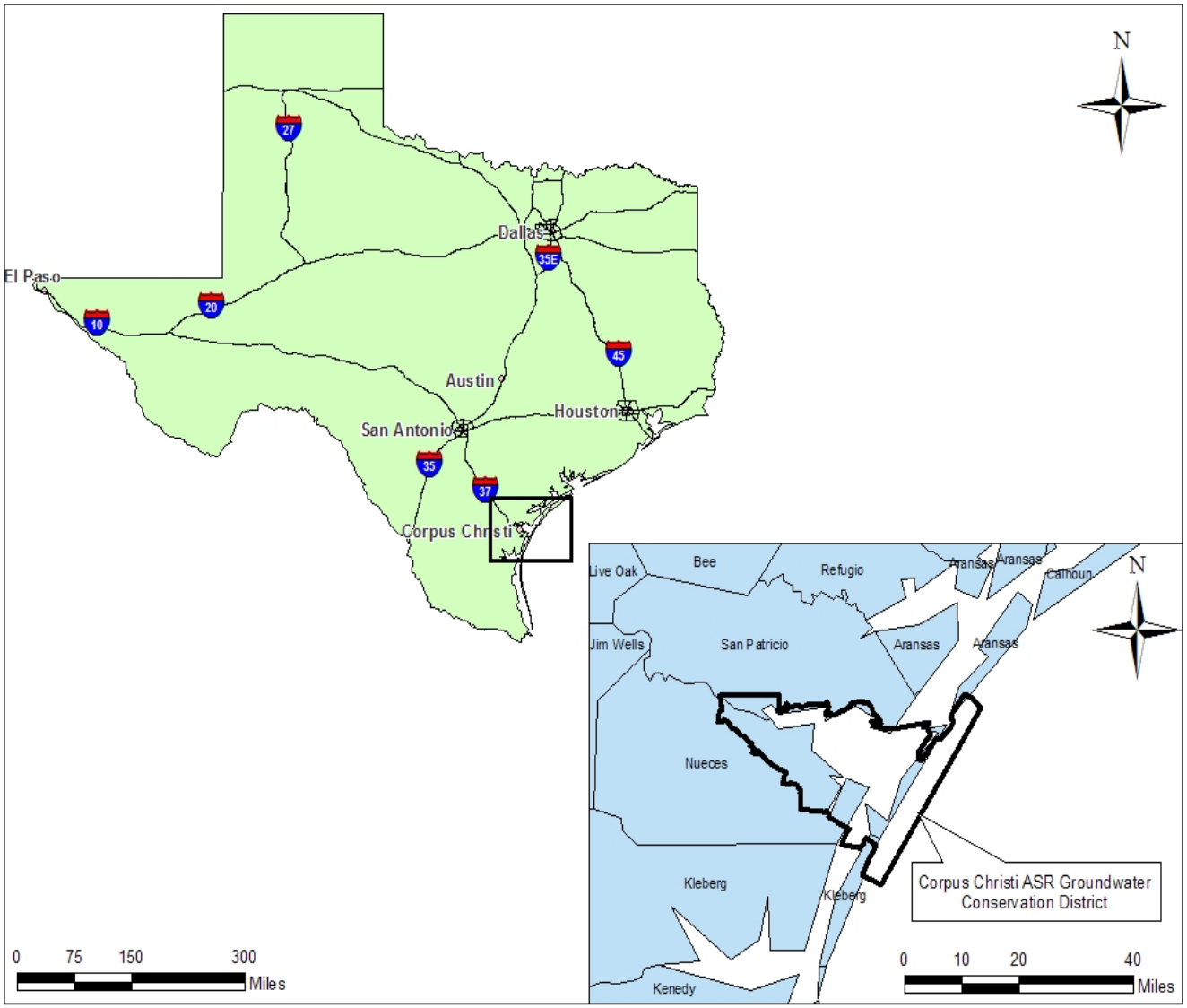

Figure 1. Location of the Corpus Christi ASR Conservation District

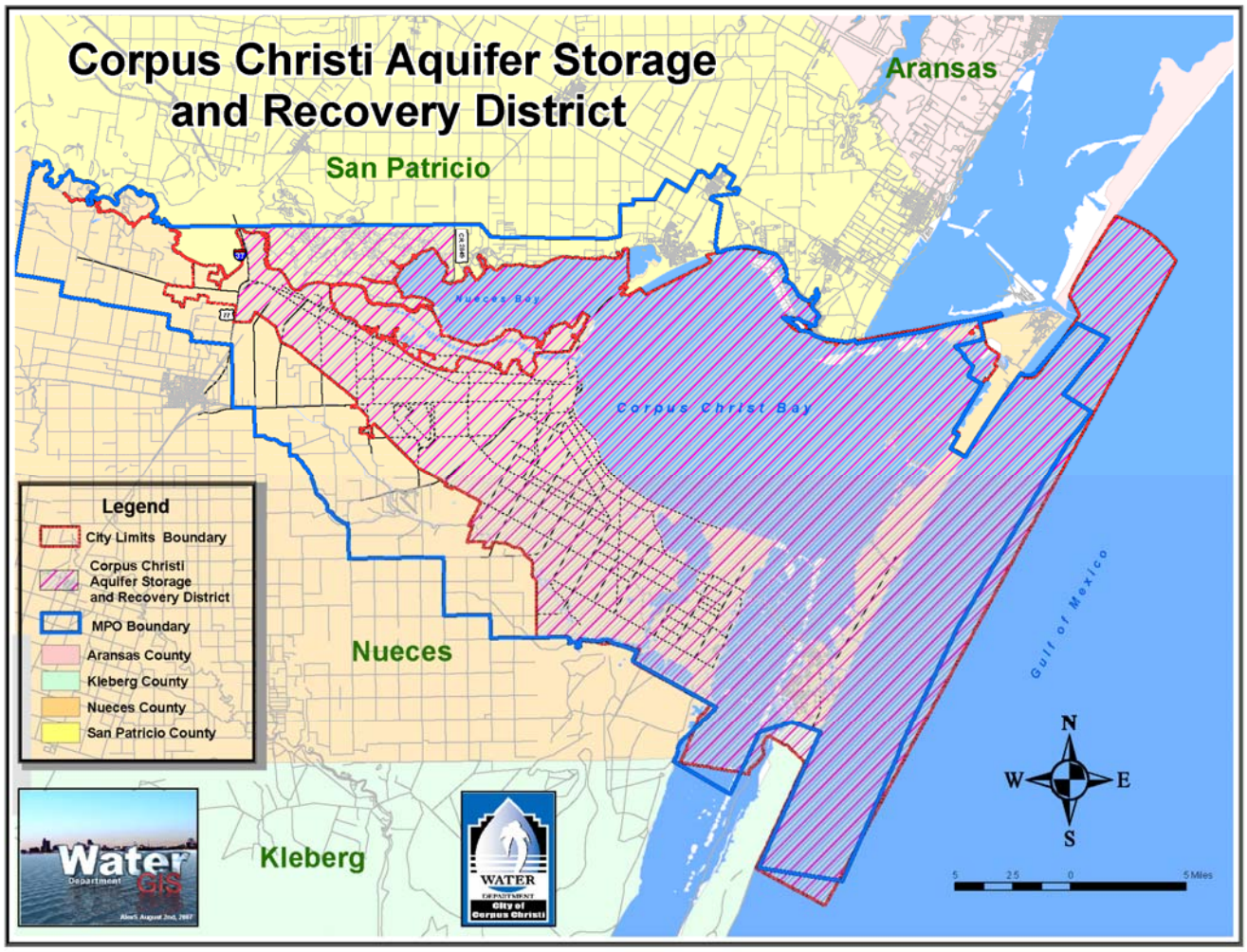

Figure 2. Location and Boundaries of the Corpus Christi ASR Conservation District

Neighboring districts include Kenedy County Groundwater District and San Patricio County groundwater Districts, both newly formed districts via legislation passed during the 2007 legislative session.

The State of Texas has established Groundwater Management Areas (GMA) throughout the State to facilitate regionalized planning for the State's groundwater resources. These GMAs are shown on Figure 3. The District is located in Groundwater Management Areas (GMA) 15 and 16. Chapter 36 Texas Water Code obligates the District to meet annually with the other groundwater conservation districts in its assigned GMAs to conduct joint planning, review management plans, and coordinate management of groundwater resources with other GCDs in GMA 15 and 16.

GMA 15 Districts include:

- Bee GCD
- Coastal Bend GCD
- Coastal Plains GCD
- Colorado County GCD
- Corpus Christi ASR CD
- Evergreen UWCD
- Fayette County GCD
- Goliad County GCD
- Lavaca County GCD
- Pecan Valley GCD
- Refugio GCD
- Texana GCD
- Victoria County GCD

GMA 16 Districts include:

- Bee GCD
- Corpus Christi ASR CD
- Duval County GCD
- Kenedy County GCD
- Live Oak UWCDMcMullen GCD
- Red Sands GCD
- San Patricio County GCD
- Starr County GCD

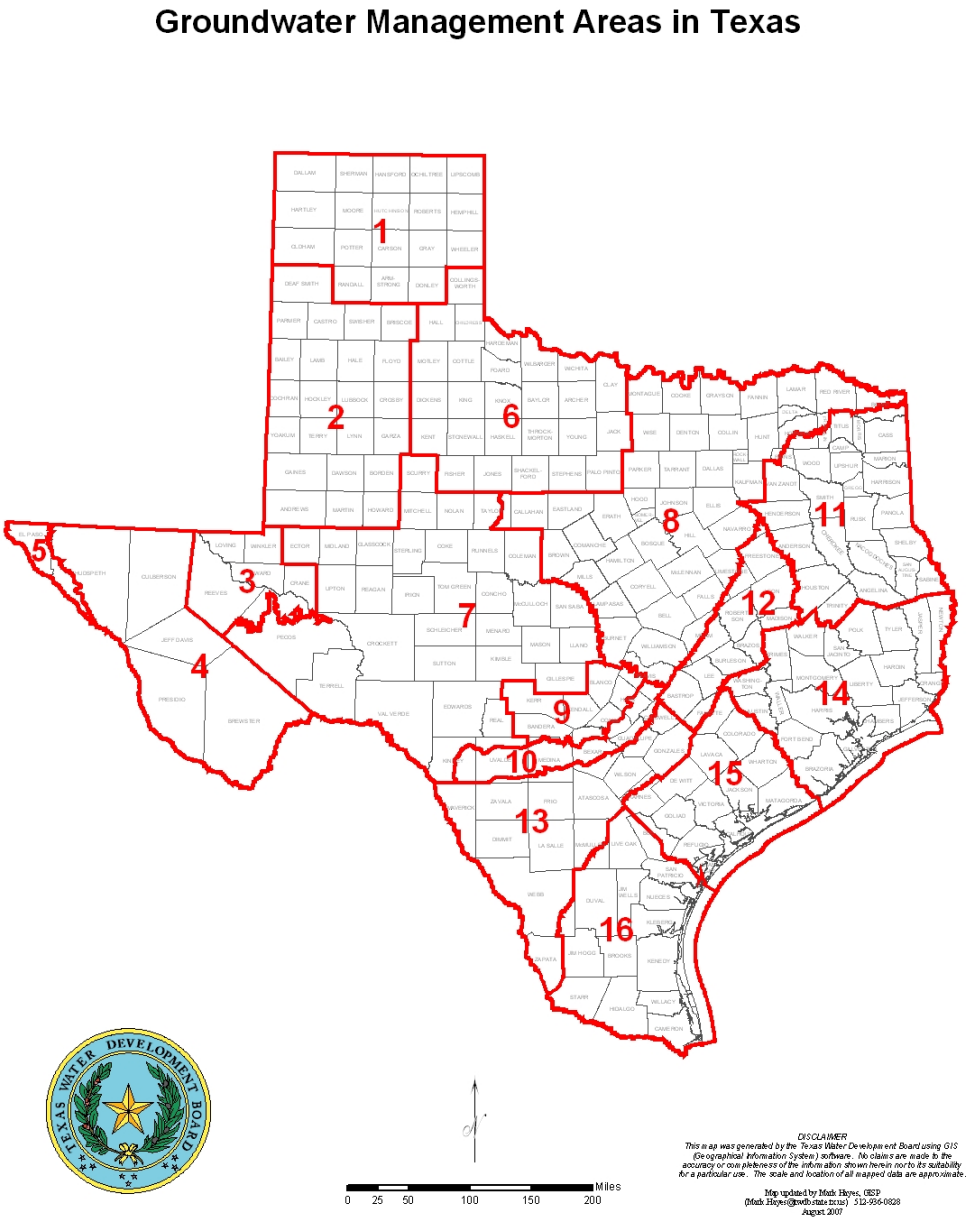

Figure 3. Groundwater Management Areas in Texas

Estimate of Managed Available Groundwater in the District Based on the Desired Future Condition Established in Joint Planning

One of the key coordination goals within each GMA is the development of desired future conditions (DFC) for the aquifers within each GMA, as required by the Texas Administrative Code :

> *"The desired, quantified condition of groundwater resources (such as water levels, water quality, spring flows, or volumes) at a specified time or times in the future or in perpetuity, as defined by participating groundwater conservation districts within a groundwater management area as part of the joint planning process." Desired future conditions have to be physically possible, individually and collectively, if different desired future conditions are stated for different geographic areas overlying an aquifer or subdivision of an aquifer."* [TAC§356.2(8)]

In establishing the desired future condition, the GCDs in a GMA are required to consider uses or condition of an aquifer within the management area that differ substantially from one geographic area to another. The districts may establish different desired future conditions for each aquifer, subdivision of an aquifer, or geologic strata, or each geographic area overlying an aquifer in whole or in part or subdivision of an aquifer within the boundaries of the GMA. The State of Texas has established a 2010 deadline for GMAs to establish DFCs for each aquifer. Based on these DFCs, the TWDB will use the appropriate groundwater availability model (GAM) to develop Managed Available Groundwater (MAG) quantities to determine the annual availability from regional aquifers based on submitted DFCs.

The desired future condition of the groundwater within the District has not yet been established in accordance with Chapter 36.108 of the Texas Water Code. The District is working with the other members of GMA 15 and GMA 16 in order to identify the DFCs of the underlying aquifers by the 2010 deadline. A MAG based on the DFC will be developed by TWDB.

The development of DFCs is also considered to be a goal for each GCD, in accordance with Chapter 36 of the Water Code. Since coordination with GMA 15 and GMA 16 is ongoing but not yet complete, the District has determined this goal to not be applicable at this time.

Groundwater Resources Within the District

The Gulf Coast Aquifer is the major aquifer present within the CCASRCD and yields moderate to large amounts of fresh to slightly saline water. It is divided into several water-bearing formations including the Catahoula, Jasper, Burkeville Confining System, Evangeline, and the Chicot, as shown in Figure 4 & 5. The Evangeline and Chicot Aquifers are the uppermost water-bearing formations and are the most productive. The Evangeline Aquifer features the highly transmissive Goliad Sands. The Chicot Aquifer is comprised of several formations, including the Beaumont and Lissie Formations. Table 2 shows the stratigraphy of the Gulf Coast aquifer in the District.

Except for the Quaternary alluvium, the geologic formations crop out in belts nearly parallel to the Gulf of Mexico. Younger formations crop out nearer the Gulf and older formations crop out inland. The formations dip toward the coast and thicken causing the older formations to dip more steeply. Faults are common and some of them have displacements of up to several hundred feet. The displacements tend to decrease upward and may not appear at the surface. Faulting generally does not disrupt regional hydraulic continuity. (Loskot et. al, 1982)

Chicot Aquifer

The Chicot aquifer is the main source of groundwater in Nueces County and consists of discontinuous layers of sand and clay of about equal thickness. It is composed of water bearing units of the Willis Sand, Lissie Formation, Beaumont Clay and Quaternary alluvium, which include all deposits from land surface to the top of the Evangeline aquifer. The Chicot aquifer contains very little fresh water in Nueces County. Individual sands may reach 500 feet in thickness. It is in hydrologic continuity with the Evangeline aquifer and the two units can be difficult to distinguish. The Chicot is delineated from the Evangeline in the subsurface mainly on higher sand to clay ratios that give the Chicot higher hydraulic conductivity. (Loskot et. al, 1982)

Evangeline Aquifer

The Evangeline aquifer consists of sand and clay of the Goliad Sand and the upper part of the Fleming Formation. The Evangeline aquifer generally contains more sand than clay. Some of the sands and clays are continuous throughout much of the area. Individual sands may reach 100 feet in thickness in the area containing fresh to slightly saline water. The maximum thickness of the Evangeline aquifer is 1,380 feet and may have up to 470 feet of sand in aggregate thickness. Fresh water may occur as deep as 2,000 feet in east-central Wharton County. (Loskot et. al, 1982)

Burkeville Confining Layer

The Burkeville confining layer is mostly clay but contains some sand layers. The Burkeville clay sequences are identified in the subsurface by electric logs and act as a regional impediment to the vertical flow of water. The Burkeville ranges from 300 to 500 feet in thickness. (Loskot et. al, 1982)

Jasper Aquifer

The Jasper aquifer is a minor source of water that may be slightly or moderately saline. It consists mainly of the Oakville Sandstone, but may include the upper part of the Catahoula Sandstone. The Oakville Sandstone contains laterally discontinuous sand and gravel lenses interbedded with shale and clay. Massive sandstone beds at the base of the formation thin upward with greater amounts of shale and clay. The Jasper aquifer ranges in thickness from about 200 to 800 feet where fresh to slightly saline water is present, but may reach 2,500 feet of thickness downdip in Wharton County. (Loskot et. al, 1982)

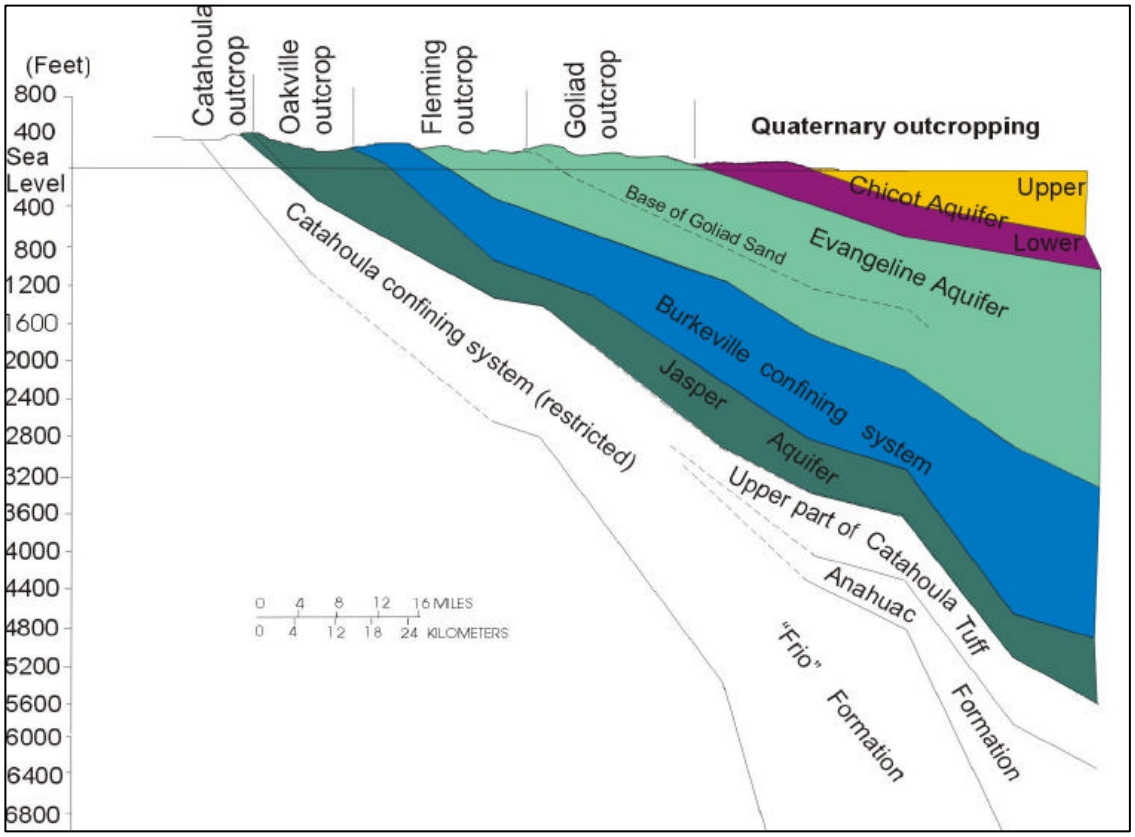

Figure 4. Cross Section of the Central Gulf Coast Aquifer

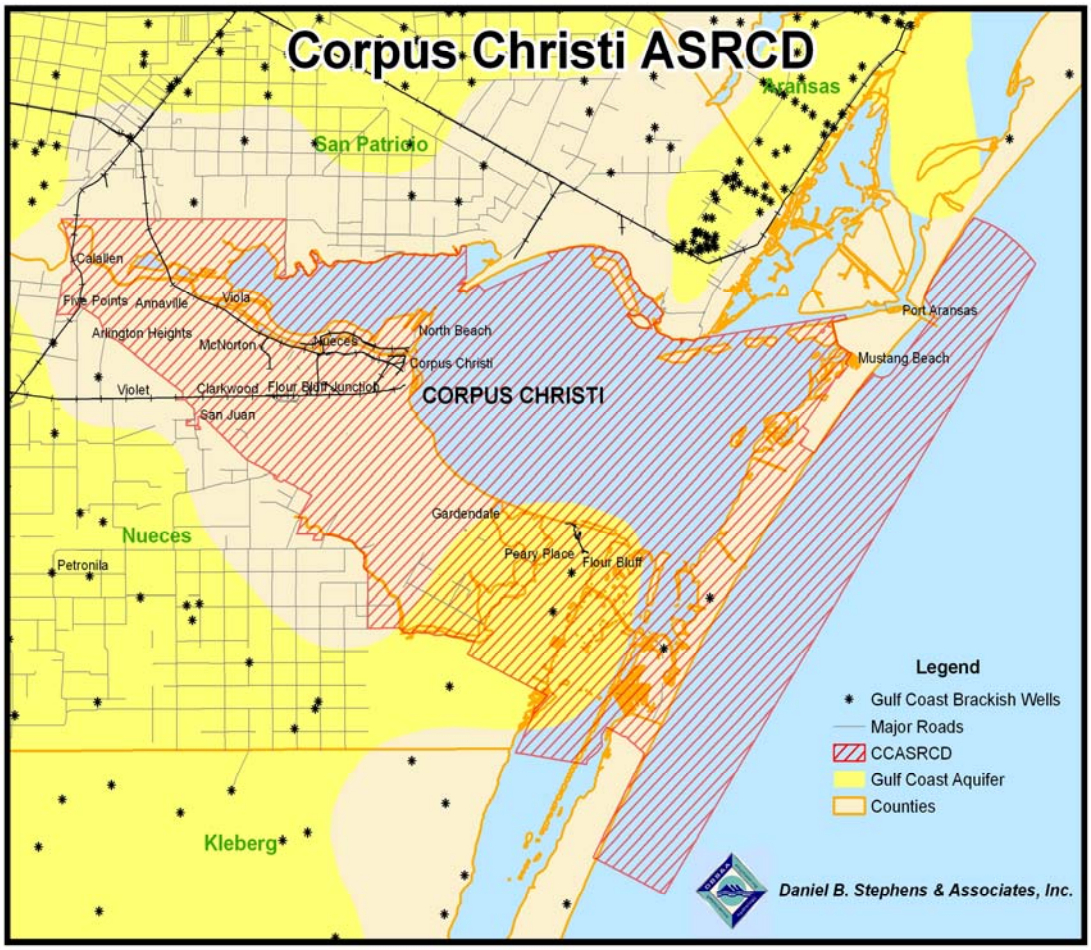

Figure 5. Aquifers within the Corpus Christi ASR Conservation District

<table>
<tr><th>System</th><th>Series</th><th colspan="2">Geologic Unit</th><th>Hydrologic Unit</th></tr>
<tr><td rowspan="5">Quaternary</td><td>Holocene</td><td colspan="2">Alluvium</td><td rowspan="5">Chicot aquifer</td></tr>
<tr><td rowspan="4">Pleistocene</td><td colspan="2">Beaumont Clay</td></tr>
<tr><td>Montgomery Formation</td><td rowspan="2">Lissie Formation</td></tr>
<tr><td>Bentley Formation</td></tr>
<tr><td colspan="2">Willis Sand</td></tr>
<tr><td rowspan="4">Tertiary</td><td>Pliocene</td><td colspan="2">Goliad Sand</td><td rowspan="2">Evangeline aquifer</td></tr>
<tr><td rowspan="3">Miocene</td><td colspan="2" rowspan="2">Fleming Formation</td></tr>
<tr><td>Burkeville Confining Zone</td></tr>
<tr><td colspan="2">Oakville Sandstone</td><td rowspan="2">Jasper aquifer</td></tr>
<tr><td colspan="2">Catahoula Sandstone (Tuff)</td></tr>
</table>

Table 2. Geologic and Hydrologic Units Within the District

The Corpus Christi ASRCD jurisdictional boundary covers four counties, including Aransas, Kleberg, Nueces, and San Patricio counties. The surface area of the District within each of these counties was calculated using a spatial analysis tool within GIS. The percentage of land within each county is as follows:

- Aransas County: 2.32%
- Kleberg County: 2.38%
- Nueces County: 35.43%
- San Patricio County: 2.92%

All water supplies available within the District are adjusted by these prorated values (percentages) and shown as a reduced volume available to the CC ASRCD. This information is included in the GMP to meet statutory requirements of 31 TAC §356.

Estimated Amount of Groundwater Being Used Within District on an Annual Basis

Texas Water Development Board data on estimated groundwater use in Aransas, Kleberg, Nueces, and San Patricio counties is shown in Table 3 for the years 1980 through 2003. This data is extracted from the Water User Survey Database. The District estimates its annual groundwater use at 2,100 acre-feet per year in the year 2000. This estimate is derived from 2007 State Water Plan water demand values adopted for use in the 2006 Coastal Bend Regional Water Plan as shown in Table 4. Average use in Nueces County over this historical period is approximately 2,573 acre-feet per year. All groundwater use is assumed to be out of the Chicot and Evangeline Formations of the Gulf Coast Aquifer.

The current estimate of the annual groundwater availability in the District is based on use and is approximately 2,100 acre-feet per year and is shown in Table 4. This estimate is based on groundwater availability data from Exhibit D and Table 3-5 of the Coastal Bend (Region N) Regional Water Plan, and the 2007 State Water Plan. This estimate is being used as a placeholder until the District can develop science-based values with more reliability.

Average Historical Groundwater Pumpage Summary by County								
Unit: Acre Feet (ACFT)								
Year	Aquifer	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total
ARANSAS COUNTY								
1980 - 2003 Average	Gulf Coast	316	100	0	0	50	5	471
	CC ASRCD	7	2	0	0	1	0	11
KLEBERG COUNTY								
1980 - 2003 Average	Gulf Coast	5,068	3	0	400	1,573	246	7,289
	CC ASRCD	121	0	0	10	37	6	174
NUECES COUNTY								
1980 - 2003 Average	Gulf Coast	1,114	698	0	569	79	114	2,573
	CC ASRCD	395	247	0	202	28	40	912
SAN PATRICIO COUNTY								
1980 - 2003 Average	Gulf Coast	2,006	3	0	1,837	79	111	4,037
	CC ASRCD	59	0	0	54	2	3	118

Table 3. Estimated Existing Total Usable Amount of Groundwater Within District

RWPG	Source Name	River Basin	2000	2010	2020	2030	2040	2050	2060
N	Gulf Coast Aquifer	Nueces	2,100	2,080	2,061	2,042	2,022	2,003	1,983
Total Projected Water Availability in ac-ft per year			**2,100**	**2,080**	**2,061**	**2,042**	**2,022**	**2,003**	**1,983**

Table 4. Estimates of Groundwater Availability for Nueces County

The District recognizes that the annual groundwater availability in the portion of the Gulf Coast Aquifer underlying the District is the sum of:

1. Recharge (the amount of water annually entering the aquifer through the infiltration of rainfall in the District);
2. Net lateral underflow (the amount of water annually entering the District through the underground migration of water moving down-gradient within the aquifer after being recharged in aquifer outcrops lying beyond District boundaries less the amount of water which may migrate in a similar fashion outside of the District boundaries); and
3. The amount of water (if any) annually taken from storage in the aquifer within the District boundaries.

The net annual amount of lateral underflow received by the aquifer underlying the District and the annual amount of water taken from storage in the aquifer within the District have yet to be determined specifically. It is anticipated that these figures will be determined over the next biennium through the employment by the District of a private consulting firm to develop sound, defensible methodologies related to this determination.

Estimated Amount of Groundwater from Precipitation Recharge Within District on Annual Basis

The amount of recharge to the Gulf Coast aquifer in the District is estimated to be approximately 368 acre-feet per year. This estimate is based on GAM report 08-03, in Appendix H, using the Central Gulf Coast aquifer Groundwater Availability Model (GAM) simulation for the District.

Recharge in the Gulf Coast aquifer occurs through the infiltration of rainfall. (Loskot et. al, 1982) The majority of the rain that falls on the land surface runs-off and is not available for recharge to the aquifer. A significant portion of the water that infiltrates the soil is lost through evapotranspiration. Another significant portion of the water that infiltrates the soil recharges the aquifer but is not held in storage because it is discharged through springs or bank seepage in creeks and rivers. (Scanlon et al, 2002) Vertical recharge to the aquifer is the fraction of the rainfall that originally infiltrated the soil and reached the aquifer to augment the amount of water in storage or available for use.

The District recognizes that this is a preliminary rate used in the development of the GAM and subject to adjustment. Other researchers have estimated the rate of recharge for the area of the Gulf Coast aquifer that is proximate to or including the District, Ryder (1988) estimated that the rate of recharge was less than 2 inches per year and Dutton and Richter (1990) estimated a range of 0.1 to 0.4 inches per year. The

District used the preliminary rate of recharge from the Central Gulf Coast GAM because it is taken from a more recent work, is within the bounds defined by the other researchers and is presented as a specific rate which may be applied to an area for estimated recharge.

Methods to Calculate Recharge

An additional method to estimate the annual recharge to the groundwater resources of the District uses the GAM (GAM 7-12, Appendix G) annual recharge rate in inches was expressed as a fraction of a foot and applied to the area of the District (in acres) to estimate recharge in acre-feet per year. The deep recharge rate (in feet per year) was multiplied by the net area of the District (in acres), where the Gulf Coast aquifer crops out, to estimate the annual amount of recharge to the groundwater resources of the District. This estimate is based on the estimated rate of annual deep recharge to the Gulf Coast aquifer of 4.6×10^{-3} inches per year used in the development of the Central Gulf Coast aquifer Groundwater Availability Model (GAM).

The methodology used to estimate the volume of annual recharge to the groundwater resources of the District can be expressed as follows:

Central Gulf Coast aquifer recharge rate (GAM 7-12) $=1.06 \times 10^{-6}$ ft/day = 0.0003869 feet per year

0.0003869 feet rounded to 0.0004 feet (to avoid undue implication of accuracy)

Area of the District = 528.26 miles^2 (ArcGIS area calculation)

(528.26 miles^2 * 640 acres per mile^2) = 338,086 acres

(0.0004 feet per year * 338,086 acres) = 135 acre-feet per year

The natural or artificial recharge in the District could theoretically be increased by building small retention structures on ephemeral streams to impound storm-water run-off.

Estimate of the Amount of Water Discharged from Aquifers Within the District

The amount of water discharged from the Gulf Coast Aquifer within the District is estimated within the GAM using the Drain Package. According to Table 5, this number is estimated to be approximately 2,900 acre-feet per year.

Table 6 shows selected flow terms for each aquifer layer, into and out of the Corpus Christi ASR Conservation District, averaged for the years 1981 to 1999 from the groundwater availability model of the central part of the Gulf Coast Aquifer. Flows are reported in acre-feet per year. Note: a negative sign refers to flow out of the aquifer in the district. A positive sign refers to flow into the aquifer in the district. All numbers are rounded to the nearest acre-foot. Flow values reported may include fresh, brackish, and saline waters.

Aquifer	Surface water inflow (AFY)	Surface water outflow (AFY)	Lateral inflow into district (AFY)	Lateral outflow from district (AFY)	Net inter-aquifer flow (upper) (AFY)	Net inter-aquifer flow (lower) (AFY)
Chicot (Layer 1)	4	2,900	7,086	-2,256	0	176
Evangeline (Layer 2)	0	0	544	-237	-176	2
Burkeville (Layer 3)	0	0	1	0	-2	0

Source: TWDB GAM Report 08-03, Appendix H

Table 5. Selected Flow Terms for Aquifer Layers within District

Management plan requirement	Aquifer	Results
Estimated annual amount of recharge from precipitation to the district	Chicot (Layer 1)	368
	Evangeline (Layer 2)	0
	Burkeville (Layer 3)	0
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, and rivers	Chicot (Layer 1)	2,900
	Evangeline (Layer 2)	0
	Burkeville (Layer 3)	0
Estimated annual volume of flow into the district within each aquifer in the district	Chicot (Layer 1)	7,086
	Evangeline (Layer 2)	544
	Burkeville (Layer 3)	1
Estimated annual volume of flow out of the district within each aquifer in the district	Chicot (Layer 1)	2,256
	Evangeline (Layer 2)	237
	Burkeville (Layer 3)	0

Source: TWDB GAM Report 08-03, Appendix H

Table 6 . Summarized Aquifer Flow Characteristics within District (acre-feet)

Estimate of the Amount of Water Flowing In and Out of the District

The amount of water flowing in and out of the District is estimated within the GAM. According to Table 6, the amount of water flowing into the District is estimated to be 7,631 acre-feet per year with 2,493 acre-feet per year estimated to be flowing out of the District.

Projected Water Supply And Demand Within District

This section presents estimates of projected water supply within the District, including estimated surface and groundwater supplies, and estimates of water demand within the District. Supply and Demand estimates presented in this section include estimates from recent City of Corpus Christi master planning efforts, the 2006 Coastal Bend (Region N) Regional Water Plan, and the 2007 State Water Plan.

The Corpus Christi ASRCD jurisdictional boundary covers four counties, including Aransas, Kleberg, Nueces, and San Patricio counties. The surface area of the District within each of these counties was calculated using a spatial analysis tool within GIS. The percentage of land within each county is as follows:

- Aransas County: 2.32%
- Kleberg County: 2.38%
- Nueces County: 35.43%
- San Patricio County: 2.92%

All water supplies available within the District are adjusted by these prorated values (percentages) and shown as a reduced volume available to the CC ASRCD. This information is included in the GMP to meet statutory requirements of 31 TAC §356.

Overview of Surface Water Supplies

Surface water currently used within the District consists of the following:

- The Nueces River including the Choke Canyon/Lake Corpus Christi Reservoir (CC/LCC) System
- Water delivered from Lake Texana near Edna, Texas via the City's Mary Rhodes Pipeline.

The City of Corpus Christi owns rights to 438,300 acre-feet per year (afy) of surface water rights on the Nueces River and CC/LCC Reservoirs. The City's current contract with the Lavaca Navidad River Authority provides for deliveries of 41,840 afy and an additional 12,000 afy on an interruptible basis. The current Regional Plan (Region N) has, by policy, adopted a safe annual yield of these surface water sources of 205,000 afy in 2010.

In 1999, the City concluded the purchase of 35,000 acre-feet per year of water rights in the Colorado River from the Garwood Irrigation Company. These senior water rights are now permitted for transfer and use in the City's service area. This water would be transported to Corpus Christi via a pipeline that will be constructed, at some future date, from the Colorado River, connecting into the Mary Rhodes (Lake Texana) Pipeline at Lake Texana.

The majority of surface water supplies are utilized within the City of Corpus Christi, and therefore within the District. The remaining supplies are treated by the City on behalf of its treated water wholesale customers, or delivered as raw water to its raw water customers. The City's wholesale treated water customers include South Texas Water Authority (STWA), San Patricio Municipal Water District (SPMWD), and Nueces County Water Control and Improvement District No. 4 (NCWCID No.4). Raw water customers include SPMWD, the Cities of Alice, Beeville, Three Rivers, and Mathis, and the industrial users Celanese and Koch.

Projected Water Supplies Within the District

Estimates of projected water supplies represent the estimated capacity of water supply systems to deliver water to meet user needs on an annual basis. Estimates of projected water supplies are compared with estimates of projected demand to determine if the existing infrastructure is capable of meeting the expected needs of a water user group. The annual water delivery capacity of different water systems in different areas may not be estimated by the same methods. Estimates of projected groundwater supplies typically represent the pumping capacity of the wells or well fields that supply a water user group. The method used to estimate projected groundwater supplies may or may not reduce projections based on expected water-level drawdown or other conditions. The estimate of projected total surface water and groundwater supplies within the District in Nueces County during the year 2010 is 179,978 acre-feet based on TWDB data from 2007 State Water Plan.

The estimate of projected surface water supplies for Aransas, Kleberg, Nueces and San Patricio Counties within the District according to the 2007 State Water Plan are presented in Table 7.

Historical Water Demands:

This section presents estimates of surface water and groundwater demands based on information developed from recent City of Corpus Christi planning efforts, the 2006 Region N Regional Water Plan, and the 2007 State Water Plan.

Historical water use within the District can be estimated based on production from the City of Corpus Christi's O.N. Stevens Water Treatment Plant (ONSWTP), as the City's water usages represent the majority of historical use within the District boundaries. Figure 6 shows historical average annual water production from the City's ONSWTP. Water production has averaged about 80,000 acre-feet per year since 1995.

Estimated Amount of Water Demand Within District on Annual Basis

The City of Corpus Christi is nearing completion of its most recent Water Distribution System Master Plan (WDSMP) Update (City Project No. 8555). As part of this master planning process, the City has adopted a concept of "obligated demand." This concept is based on the premise that the City becomes obligated to provide treatment, transmission, distribution and storage capacity for property as soon as the property is platted, whether developed or not. It is therefore appropriate to plan for and allocate resources (water supply and treatment, transmission, distribution, and storage capacity) necessary to supply water to these properties. This estimate of projected demands constitutes the current best estimate of demands within the District, as the City's projected demands will comprise the bulk of anticipated demands.

The Texas Water Development Board (TWDB) has also developed demand projections for Nueces County as part of ongoing regional water supply planning and has also collected updated water use survey data.

Projected Surface Water Supplies Available (acre-feet/year)						
	2010	**2020**	**2030**	**2040**	**2050**	**2060**
Total Surface Water Supplies Available	187,595	190,128	192,383	194,660	195,577	194,891
Surface Water Supplies Available within District	57,665	57,561	57,484	57,466	57,330	57,230

Source: 2007 State Water Plan

Table 7. Projected Available Surface Water Supplies

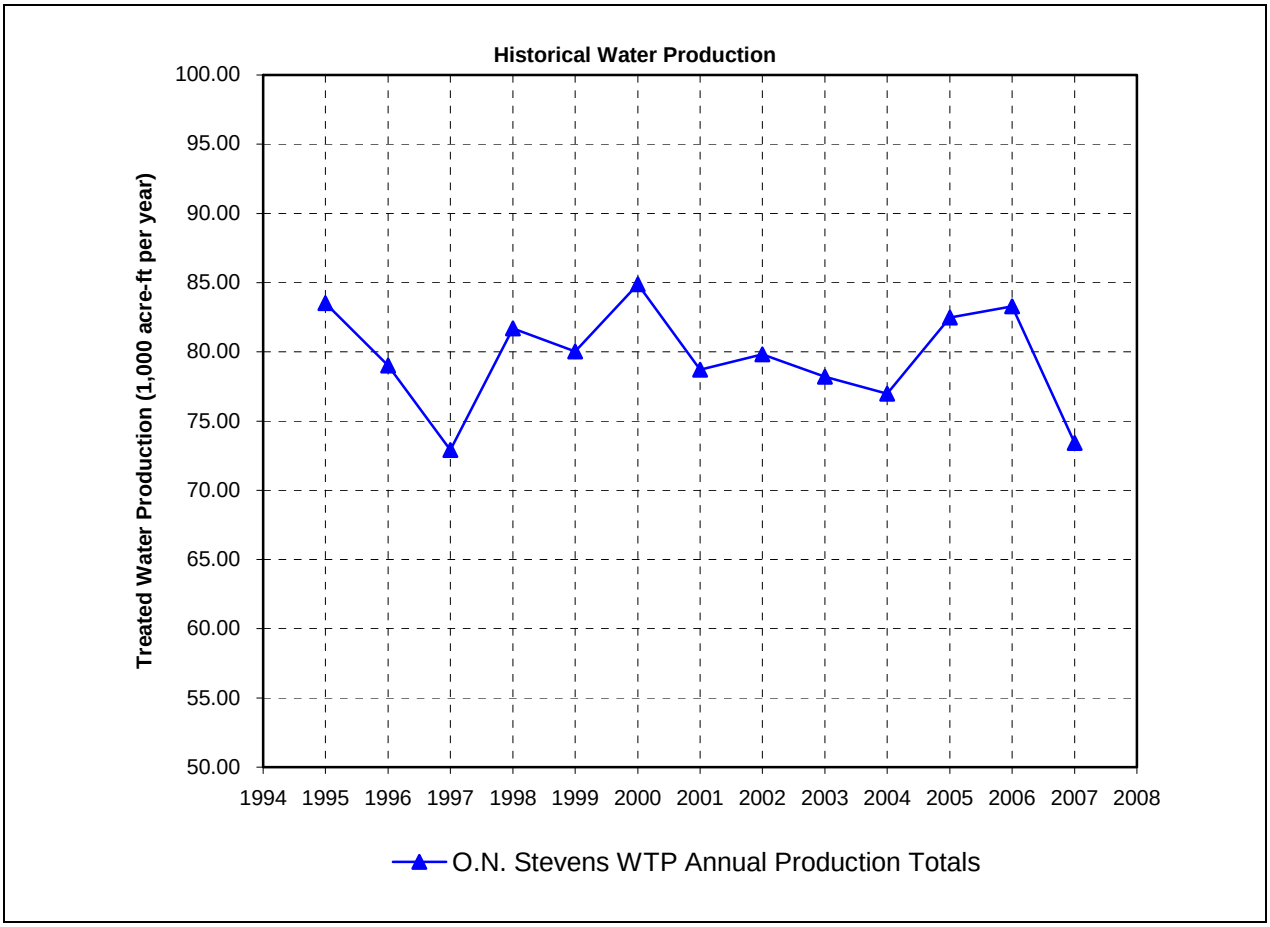

Figure 6. Historical Water Production

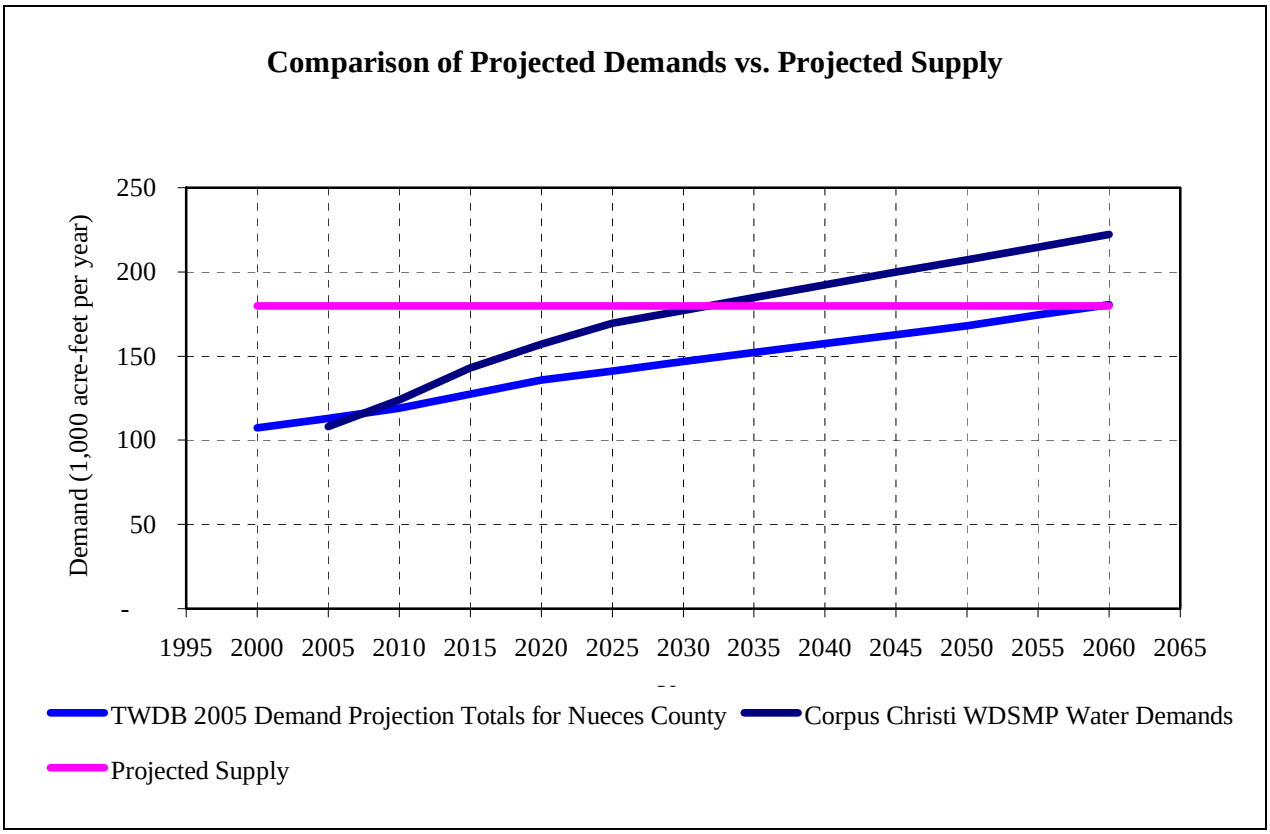

Figure 7. Comparison of Projected Demands vs. Projected Supply

Projected Water Demands (acre-feet/year)						
	2010	**2020**	**2030**	**2040**	**2050**	**2060**
Total Water Demands	175,919	200,893	217,760	234,221	249,690	266,078
Water Demands within District	47,070	54,522	59,654	64,588	69,289	74,322

Source: 2007 State Water Plan

Table 8. Projected Water Demands Within the District

Figure 7 shows the projected demands within the City's ETJ as envisioned by the Water Distribution System Master Plan Update, compared with current TWDB estimates. Projected demands from the City's master plan are higher than 2007 State Water Plan estimates. This difference is likely attributable to differences in estimating methodology. For purposes of this management plan, the City's master plan estimates will be adopted as the most appropriate demand projection for the District.

The estimate of projected water demands for Aransas, Kleberg, Nueces and San Patricio counties within the District according to the 2007 State Water Plan are presented in Table 8.

Groundwater Demands

Historical groundwater use tables for Aransas, Kleberg, Nueces, and San Patricio counties are found in Appendix I and summarized in Table 3. Groundwater supply available is determined based on use.

Future Needs

The 2007 State Water Plan estimates that approximately 176,171 acre-feet per year will be available to Nueces County in the form of surface water rights from the Nueces River and Lake Texana. This estimate appears to account for the City's contractual obligations to its raw water customers outside of Nueces County.

Projected demands could begin to exceed available supplies by as early as 2020. The most conservative estimates indicate that demands will exceed available supplies by approximately 2030.

Figure 8 graphically presents estimates of needed supply within the District based on the three demand estimates presented earlier.

The District will be faced with water needs ranging from approximately 20,000 acre-feet/year to in excess of 60,000 acre-feet/year by the year 2060.

The estimate of projected water needs for Aransas, Kleberg, Nueces and San Patricio Counties within the District according to the 2007 State Water Plan are presented in Table 9.

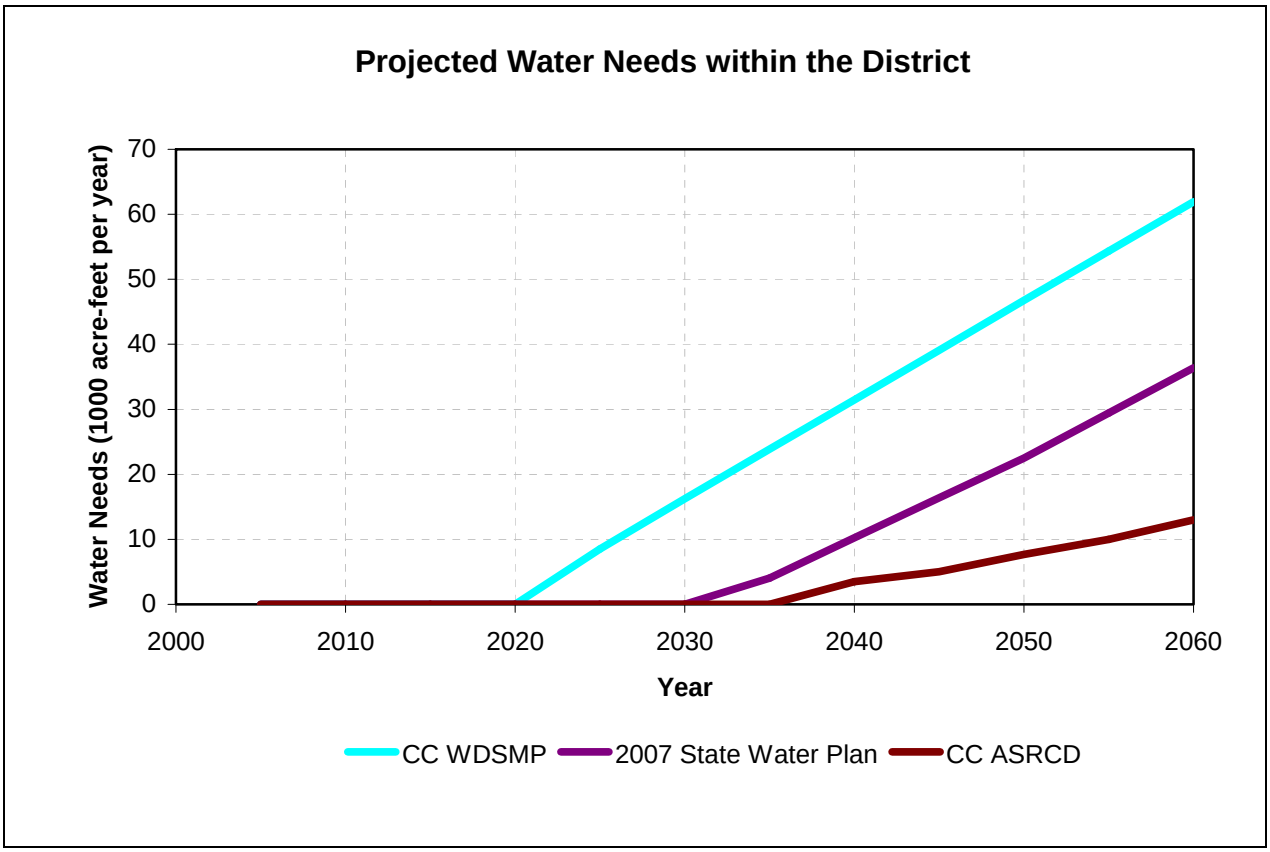

Figure 8. Projected Water Needs within the District

Projected Water Needs/Surplus (acre-feet/year)						
	2010	**2020**	**2030**	**2040**	**2050**	**2060**
Total Water Needs	2,239	2,654	2,330	-10,023	-23,900	-37,526
Water Needs within District	817	979	884	-3,480	-7,873	-12,721

Source: 2007 State Water Plan

Table 9. Projected Water Needs Within the District

Water Management Strategies to Meet Needs of Water User Groups

The Regional Water Planning Group has developed Water Management Strategies to address the needs of the water user groups for future water supplies. The following strategies are included in the 2007 State Water Plan to address the water supply needs within the District:

- Reclaimed Wastewater Supplies
- Gulf Coast Aquifer Supplies
- USCOE Nueces River Feasibility Projects - LCC/CC Pipeline
- Stage II of Lake Texana/Construction of Palmetto Bend Phase II on Lavaca River
- Garwood Pipeline and Off-Channel Reservoir Storage
- USCOE Nueces River Feasibility Projects - Off Channel Reservoir
- USCOE Nueces River Feasibility Projects - Seawater Desalination

District Coordination with Surface Water Management Entities

As part of the District's coordination efforts, a copy of the adopted groundwater management plan has been sent to the following surface water management entities following adoption of the management plan by the District Board and prior to submittal to the TWDB for official review and approval. Proof of this coordination has been provided in the form of transmittal letters to each of these entities. Copies of these transmittal letters have been provided in Appendix C.

Nueces River Authority

Lavaca-Navidad River Authority

Region N Regional Water Planning Group

Region P Regional Water Planning Group

San Patricio County Groundwater Conservation District

Kenedy County Groundwater Conservation District

Live Oak Underground Water Conservation District

Nueces County Water Control and Improvement District #4

How the District Has Addressed Water Supply Needs in a Manner Not in Conflict with the Approved Regional Water Plan

In order to address water supply needs in a manner not in conflict with the TWDB approved regional water plan from the Coastal Bend Regional Water Planning Group (Region N), the District has adopted a groundwater availability value of 2,100 ac-ft per year taken from Exhibit B, Data Table 4 of the approved Region N Regional Water Plan.

The District will manage the supply of groundwater within the District in order to conserve the resource while seeking to maintain the economic viability of all resource user groups, public and private. In consideration of the economic and cultural activities occurring within the District, the District will identify and engage in such activities and practices, that if implemented would result in more efficient use of groundwater. An observation network shall be established and maintained in order to monitor changing storage conditions of groundwater supplies within the District. The District will make a regular assessment of water supply and groundwater storage conditions and will report those conditions to the District Board and to the public. The District will undertake, as necessary and co-operate with investigations of the groundwater resources within the District and will make the results of investigations available to the public upon adoption by the District Board. Notwithstanding, all actions and rules of the District will adhere to the Texas Water Code.

The District may adopt rules to regulate groundwater withdrawals by means of spacing and production limits. The District may deny a well construction permit or limit groundwater withdrawals in accordance with the guidelines stated in the rules of the District. In making a determination to deny a permit or limit

groundwater withdrawals, the District will consider the public benefit against individual hardship after considering all appropriate testimony.

The relevant factors to be considered in making a determination to deny a permit or limit groundwater withdrawals will include:

1) The purpose of the rules of the District

2) The distribution of groundwater resources

3) The economic hardship resulting from grant or denial of a permit or the terms prescribed by the permit

4) Whether the groundwater resources in the vicinity may be contaminated by pollutants

The District is committed to maintaining a sustainable, adequate, reliable, cost effective and high quality source of groundwater to promote the vitality, economy and environment of the District. In pursuit of the District's mission of protecting the resource, the District may require reduction of groundwater withdrawals to amounts, which will not cause harm to the aquifer. To achieve this purpose, the District may, at the District Board's discretion amend or revoke any permits after notice and hearing. The determination to seek the amendment or revocation of a permit by the District will be based on aquifer conditions observed by the District.

The District will enforce the terms and conditions of permits and the rules of the District by enjoining the permit holder in a court of competent jurisdiction as provided for in Texas Water Code Chapter 36.102.

The District will employ technical resources at its disposal to evaluate the resources available within the District and to determine the effectiveness of regulatory or conservation measures. A public or private user may appeal to the District Board for discretion in enforcement of the provisions of the water supply deficit contingency plan on grounds of adverse economic hardship or unique local conditions. The exercise of said discretion by the District Board shall not be construed as limiting the power of the Board.

ASR Objectives

ASR has been used or proposed for use within the District to meet the following objectives:

- Seasonal, Long-term and Emergency (strategic reserve) storage;
- Augment peak water supply capacity;
- Improving system water quality by maintaining distribution system flow during low demand months;
- Defer expansion of water system infrastructure by using ASR to meet seasonal and peak water demands;
- Streamflow diversion mitigation;
- Stormwater flow and estuary salinity management;
- Help meeting large retail customer demands;
- Other objectives, as developed.

Considering the water supply situation within the District's jurisdiction, the District has determined that its initial objectives for ASR should include the following:

- Seasonal Storage: Water demands within the District vary seasonally, with the summer months of May through September typically having higher demands as compared to the rest of the year. ASR can be used to store water during low demand periods and recovered during periods of higher demands. This benefits the system by allowing water treatment facilities, distribution, and pumping facilities to operate at a more uniform rate year-round.
- Long-term Storage: The availability of water supplies varies year to year, and ASR can be utilized to help firm up water supply by storing water underground in times of excess supply and pumping water from storage during times of drought.
- Emergency (strategic reserve) storage: Water stored via ASR can serve as an emergency supply or strategic reserve. For instance, ASR facilities located on Padre or Mustang Islands could provide a significant fraction of water demands on the Island if the water supply from the mainland was somehow interrupted.
- Streamflow diversion mitigation: The City currently operates the Choke Canyon/Lake Corpus Christi Reservoir System to meet certain minimum flow requirements in Nueces Bay. It may be possible to use ASR to help meet these minimum flow requirements, thereby increasing the overall yield of the surface water supplies within the District.

Other uses for ASR may be identified by the District as the water supply and demand situation changes within the District. The District will continue to monitor the water supply situation and will adjust its ASR objectives as appropriate.

Identification of ASR Operations within the District

There are currently no ASR facilities in operation within the District. However, ASR has been evaluated as part of three prior studies sponsored by the City. These studies include:

- Padre Island Desalination Plant Feasibility Analysis and Siting Plan, Stage 1 – Assessment and Demonstration Project, Phase 1 – Assessment Phase Technical Memorandum, June 2003, City of Corpus Christi Project No. 8423, prepared by Carollo Engineers, P.C.
- Padre Island Desalination Plant Feasibility Analysis and Siting Plan, Stage 1 – Assessment and Demonstration Project, Phase 2 – Validation Studies, Evaluation of Water Supply Alternatives, Draft, September 2004, City of Corpus Christi Project No. 8423, prepared by Carollo Engineers, P.C. This analysis includes a supplementary study titled "Geologic Testing Validation Report," August, 2004 prepared by ASR Systems, LLC.
- Appendix E, Water System Interactive Hydraulic Model and Analysis, August 2005, City Project No. 8487, prepared by LNV Engineering, Inc.

Use of ASR was originally proposed as part of a desalination facility to be constructed on North Padre Island to supplement existing City supplies. Initial recovery rates in excess of 10 million gallons per day (mgd) were postulated based on desktop studies. Preliminary evaluations, including hydrogeologic exploration and testing completed on North Padre and Mustang Islands, appear to validate the feasibility of ASR operations, albeit at somewhat lower recovery pumping (not more than about 10 mgd per well site) rates than initially anticipated. The City's current long-range planning includes development of up to two ASR wellfields on North Padre and Mustang Islands with a total recovery rate of 7.5 mgd. Total target storage volume for the two ASR wellfields on the Island is approximately 1,200 million gallons, or about 3,700 acre-feet. This volume would allow recovery from ASR storage at a rate of about 7.5 mgd for a period of about 5 months.

The City extended its evaluation of ASR to the mainland in the 2005 report prepared by LNV Engineering, Inc. The criteria used in this evaluation included development of approximately 40 mgd of recovery capacity over a period of about five months. This recovery rate would be sufficient to allow the City to remove one treatment train at its O.N. Stevens Water Treatment Plant from service for this period of time. Additional ASR facilities could be constructed to expand ASR operations as needed. Total target storage volume for the mainland ASR wellfields under these recovery assumptions is approximately 6,100 million gallons, or about 19,000 acre-feet.

Estimate of Potential Storage Capacity, by Aquifer, for ASR Operations

The 2003 and 2004 reports prepared by Carollo Engineers identified the lower ranges of the Chicot Aquifer as the preferred target aquifer for ASR facilities on North Padre and Mustang Islands. Studies conducted to date appear to support the ability of the Chicot aquifer, possibly in conjunction with the deeper Evangeline Formation to support the target storage volume for the North Padre and Mustang Island service area. The geology of the formation, particularly the possibility of subsidence, probably limits recovery rates to not more than 10 mgd per well site, however.

The analysis contained in the 2005 LNV report recommends establishment of mainland ASR facilities in both the Chicot and Evangeline Aquifers. Preliminary geologic assessments appear to validate the ability of both of these aquifers to support the identified target storage volume.

Additional studies will be needed to determine the full storage potential for ASR operations within the District.

Actions, Procedures, Performance and Avoidance for Plan Implementation

The District will implement the provisions of this management plan and will utilize the objectives of the plan as a guide for District actions, operations and decision-making. The District will ensure that it's planning efforts, activities and operations are consistent with the provisions of this plan.

The District will adopt rules in accordance with Chapter 36 of the Texas Water Code and all rules will be followed and enforced. The development of rules will be based on the best scientific information and technical evidence available to the District. Proposed rules are found in Appendix E.

The District will encourage cooperation and coordination in the implementation of this plan. All operations and activities will be performed in a manner that encourages the cooperation of the citizens of the District and with the appropriate water management entities at the state, regional and local level.

Management Goals, Methodology, Management Objectives, and Performance Standards Required To Be Addressed In the Plan

The District will operate initially under the following management goals and objectives, and will develop and adopt additional objectives as necessary to facilitate implementation of aquifer storage recovery within the District.

The general manager of the District will prepare and submit an annual report (Annual Report) to the District Board of Directors. The Annual Report will include an update on the District's performance in achieving the management goals contained in this plan. The general manager will present the Annual Report to the Board of Directors within ninety (90) days following the completion of the District's Fiscal Year, beginning in the fiscal year starting on August 1, 2008. A copy of the annual audit of District financial records will be included in the Annual Report. The District will maintain a copy of the Annual Report on file for public inspection at the District offices, upon adoption by the Board of Directors.

The District has determined that recharge enhancement, rainwater harvesting, precipitation enhancement, and brush control are neither appropriate nor cost-effective at this time. The District will continue to monitor the applicability and cost-effectiveness of these methodologies and reserves the right to develop management goals that include these methods as a later date as they may become appropriate and cost-effective.

The development of desired future conditions (DFC) is also considered to be a goal for each GCD, in accordance with Chapter 36 of the Water Code. The District is working with GMAs 15 and 16 in establishing DFCs for the aquifers underlying these GMAs, but the process is ongoing and not yet complete. As such, the District has determined that the DFC goal is not applicable at this time. The District is continuing to work with the other members of GMAs 15 and 16 to develop DFCs for the underlying aquifers by the 2010 deadline.

Measurement of Success in Achieving Management Goals

The District is dedicated to protecting groundwater supplies within the district, developing and maintaining an aquifer storage and recovery program, providing the most efficient use of groundwater resources to supplement existing supplies, while controlling and preventing waste of groundwater.

1) Natural Resource Issues That Affect the Use and Availability of Groundwater or are affected by the Use of Groundwater.

1.1 Objective –Within the first year following adoption of this management plan and approval by the Texas Water Development Board (TWDB), the District will send one letter to the Texas Railroad Commission (TRC) and one letter to the United State Environmental Protection Agency (USEPA) requesting the location of existing salt water and/or waste disposal injection wells permitted by the TRC and USEPA. Annually thereafter, the District will send one letter to the TRC and one letter to the USEPA requesting the location of any new salt water or waste disposal injection wells permitted by the TRC and USEPA

1.1 Performance Standard – The District will include one copy of the letter sent to the TRC and one copy of the letter sent to the USEPA in each annual report. Within the first year following adoption of this management plan and approval by TWDB, the District will, using the information obtained from TRC and USEPA, prepare a map showing the locations of any salt water and/or waste disposal injection wells within the District, and will prepare a table listing the salt water and/or waste disposal injection wells within the District. The map and table will be included in the District's first annual report. Annually thereafter, the District will update the map and table with any new information received from TRC and USEPA, and include a summary of the number of new salt water and/or waste disposal wells, and the updated map and updated table in the District's Annual Report.

1.2 Objective – Within the first year following adoption of this management plan and approval by TWDB, the District will send a letter to the Texas Railroad Commission (TRC) requesting a copy of the results of all previous integrity tests performed on any salt water and/or waste disposal injection wells permitted by the Texas Railroad Commission to operate within the District. Annually thereafter, on the anniversary of sending the initial letter to the TRC, the District will send a new letter to the TRC

requesting copies of any integrity tests performed during the prior 12-month period on any salt water and/or waste disposal injection wells permitting to operate by TRC within the District..

1.2 Performance Standard –The District will include one copy of the letter sent to the TRC in each annual report. Within the first year following adoption of this management plan and approval by TWDB, the District will, using the information obtained from TRC, prepare a database that contains a listing of each salt water and/or waste disposal injection well permitted in the District and the results of the integrity testing for each well as received from TRC. A summary table listing each well, the latest integrity test for each well, and a summary of the results of the integrity test will be included in the District's first annual report. Annually thereafter, the District will include the number of integrity tests performed by other regulatory agencies, update the database and table with any new information received from TRC, and include the updated map table in the District's Annual Report.

1.3 Objective – Within the first year following adoption of this management plan and approval by TWDB, the District will investigate the location, depth, and uses of all existing water wells within the District. This investigation will include appropriate written inquiries to agencies of the State of Texas, and other research as may be appropriate. The District will use this information to populate a database of water wells within its jurisdiction. The District will continuously update this database using information from the District's water well permitting process. Annually thereafter, the District will submit written requests for data from appropriate agencies of the State of Texas regarding the number, location, depth, and use of new water wells located within the District's jurisdiction, and update its database with the data received from the State agencies.

1.3 Performance Standard – Within the first year following adoption of this management plan and approval by TWDB, the District will, using the information obtained from its investigation, prepare a database that contains a quantitative listing of each water well, and other pertinent data, located within the District's jurisdiction. A map will be prepared showing the location of each well. The District will also prepare a summary table listing each water well, and pertinent characteristics of each well, including but not limited to, location, total depth, casing and screen information, capacity, and use. The map and summary table will be included in the District's first annual report. Annually thereafter, the District will update the database, map, and table with any new information collected during permit activities or received from state agencies, and will include copies of written requests to state agencies, the number of new wells identified, the updated map, and updated summary table in the District's Annual Report.

2) Addressing Drought Conditions.

2.1 Objective – The District will monitor City of Corpus Christi drought triggers, and as drought triggers change, meet and coordinate potential drought response with the City of Corpus Christi.

2.1 Performance Standard – The District will, in each of its annual reports, document the number of drought condition changes, a description of each drought condition change, and a description of any drought response actions taken by the City of Corpus Christ and/or the District.

3) Conjunctive Surface Water Management Issues.

3.1 Objective – Each year, the District will participate in the regional planning process by attending the Region L and Region N Regional Water Planning Group meetings to encourage the development of surface water supplies to meet the needs of water user groups in the District. A representative of the District will attend a minimum of 50 percent of the Region L Regional Water Planning Group meetings and a minimum of 50 percent of the Region N Regional Water Planning Group meetings.

3.1 Performance Standard – The District will, in each annual report, document the participation of District representatives in Region L and Region N meetings and the number of meetings attended in the preceding calendar year. Documentation will consist of a table listing all Region L and Region N meetings scheduled during the preceding 12 months, and the name(s) of District staff attending.

4) Controlling and Preventing the Waste of Groundwater in the District.

4.1 Objective – Each year, the District will review and evaluate the District Rules to determine whether any amendments are needed to decrease the amount of waste of groundwater within the District. The District's review of its rules will take place during a properly noticed meeting, and any decisions regarding amendments to the District rules will be via formal District Board action and will be documented in the minutes of the Board.

4.1 Performance Standard – The District will, in each annual report, include a summary discussion of the District Board's review and decisions regarding amendments to the District Rules. Documentation in the annual report will include at minimum, the date, time, and location of the District Board meeting, and

documentation (in the form of approved meeting minutes) of the Board's review and actions (if any) taken regarding rule amendments.

4.2 Objective – Each year, the District will meet with the City of Corpus Christi to identify opportunities to cooperate in providing information to the public regarding eliminating and reducing wasteful practices in the use of groundwater.

4.2 Performance Standard – Following each meeting with the City of Corpus Christi, district staff will document the topics of discussion with the City in the form of written meeting minutes, and prepare a summary of opportunities for cooperation with the City regarding public information regarding efficient use of the District's groundwater. These opportunities will be presented to the District Board for discussion and action. The District will, in each annual report, include a summary discussion of the Board's review and decisions regarding cooperative public information activities with the City. Documentation in the annual report will include at minimum, the date, time, and location of the District Board meeting, and documentation (in the form of approved meeting minutes) of the Board's review and actions (if any) taken regarding cooperative venture. If the District Board elects to pursue cooperative activities with the City, the annual report will also include the number of cooperative activities participated in by the District, along with a summary description of each activity.

5) Controlling and Preventing Subsidence.

5.1 Objective – Within the first year following adoption of this management plan and approval by TWDB, the District will develop a subsidence monitoring plan to monitor potential subsidence within the District. The subsidence monitoring plan will include an overall assessment of subsidence potential within the District based on projected groundwater usage and potential ASR operations, protocols for monitoring subsidence throughout the District, and protocols for coordinating potential responses to subsidence with adjacent Groundwater Conservation Districts.

5.1 Performance Standard – The District will include the subsidence monitoring plan as part of its first annual report following approval of this management plan by TWDB. The District will, in each annual report thereafter, summarize the results of the subsidence monitoring plan for the prior 12 months, including the number of any identified points of subsidence, and the number and description of any subsidence-related coordination efforts with adjacent groundwater conservation districts.

5.2 Objective – Within the second year after adoption of this management plan and approval by TWDB, the District will review the results of subsidence monitoring within the District (see Objective 5.1) and develop, as appropriate based on subsidence monitoring, a public education program regarding subsidence. Each year thereafter, the District will review annual subsidence monitoring results and its current subsidence-related public education program, and modify, as appropriate, its public education program.

5.2 Performance Standard – The District shall, in its second annual report, include its subsidence-related public education program. Annually thereafter, the District will include a summary of the number of educational programs initiated or conducted during the preceding 12 months, report the number of changes, if any, to its subsidence-related public education program, and will provide a summary of the changes to its subsidence-related education program.

6) Addressing Conservation.

6.1 Objective – Within the first year following adoption of this management plan and approval by TWDB, the District will submit at least one article regarding water conservation to at least one newspaper of general circulation in the District for publication. The primary newspaper shall be the Corpus Christi Caller-Times. The District may cooperate with the City of Corpus Christi in submission of these water conservation articles.

6.1 Performance Standard – The District shall, in each of its annual reports, provide the number of articles submitted for publication during the previous 12 months, either as submitted individually from the District or in submitted in cooperation with the City of Corpus Christi. Each annual report shall include a copy of each article submitted for publication during the prior 12 months, and, if published, shall include the date of publication.

6.2 Objective – Within the first year following adoption of this management plan and approval by TWDB, the District will develop an educational program, or implement a pre-existing educational program, for use in public or private schools located in the District. The purpose of this educational program will be to educate students concerning water conservation. This objective may also be achieved by cooperative participation with the City of Corpus Christi in water conservation educational programming.

6.2 Performance Standard – The District shall, in its first annual report, provide a summary of the educational program adopted for use, including time, date, and location of the District Board meeting at which the educational program was adopted. Approved District Board meeting minutes shall also be included as part of the documentation. The first annual report and subsequent annual reports shall also include a summary of the number of schools in which the educational program has been implemented

6.3 Objective – Within the first year following adoption of this management plan and approval by TWDB, the District will develop and/or select an informative pamphlet regarding water conservation. This pamphlet may be developed independently by the District, or developed in cooperation with the City of Corpus Christi. The District, independently or in cooperation with the City of Corpus Christi, may also purchase an appropriate pamphlet from state or national publishers such as the American Water Works Association, the Water Environment Federation, or similar entities. Each year, the District will mail the pamphlet to groundwater use permit holders within the District, or otherwise cooperate with the City of Corpus Christi in a similar mailing.

6.3 Performance Standard – The District shall, in its first annual report, provide a summary of the pamphlet selection process and include one copy of the pamphlet selected for distribution. This summary shall include the time, date, and location of the District Board meeting at which the pamphlet selection, or other action taken to adopt a cooperative approach with the City, was made. Approved board meeting minutes shall also be included as part of the documentation. The first annual report, and subsequent annual reports shall include a summary of the number of pamphlets mailed to groundwater use permit holders, or otherwise quantify the number of mailings if mailings were performed cooperatively with the City of Corpus Christi.

7) Providing for the Most Efficient Use of Groundwater in the District.

7.1 Objective – Each year, the District will require all new exempt or permitted wells that are constructed within the boundaries of the District to be registered with the District in accordance with the District rules.

7.1 Performance Standard – The District shall, in each of its annual reports, provide the number of exempt and permitted wells registered by the District for the prior year.

7.2 Objective – The District will regulate the production of groundwater by developing and maintaining a permitting system to regulate the construction of wells and use of groundwater within the boundaries of the District. The District will develop and adopt, via Board action, the permitting system within one year following adoption of this management plan and approval by TWDB. Following District Board adoption of the permitting system, the District will apply the permitting system to all new wells constructed in the District. The District will consider whether to retroactively permit existing water wells within the District,.

7.2 Performance Standard – The District shall, in its first annual report, summarize the development of its permitting system and include a checklist, flowchart, or other means to describe the permitting process. This summary shall include the time, date, and location of the District Board meeting at which the permitting system was adopted by the District Board, and shall include approved meeting minutes as additional documentation. The District shall, in each succeeding annual report, provide a summary of the number and type of applications made for the permitted use of groundwater in the District and the number and type of permits issued, and the total number of wells currently permitted within the District. Should the permitting process include requirements to report total annual pumpage from the wells within the District, then the annual report will also include a summary quantifying the total pumpage within the District.

7.3 Objective – The District will, within 36 months following adoption of the management plan and approval by TWDB, conduct a study to characterize the hydrogeologic and geographic characteristics of the aquifers underlying the District. The purpose of this study is to develop a basis for establish a monitoring well network within the District (see Goal 7.4) to monitor water levels in the aquifers and monitor aquifer water quality (See Goal 7.5).

7.3.1 Performance Standard – The District shall, within 36 months following adoption of this management plan and approval by TWDB, complete a study of the hydrogeologic and geographic characteristics of the District. This study may include, but is not limited to, amount of aquifer structure and extent, water use, water quality, and water-levels. The study will include, in coordination with other District management objectives, an assessment of existing wells suitable for use in monitoring groundwater levels and quality within the District, and a recommendation (if necessary) concerning construction of new monitoring wells. The District shall report on the status of the study in each annual

report prior to study completion. This summary shall include an estimate of the percentage completion of the study.

7.4 Objective – The District will establish a monitoring well network within the District to monitor water levels in the aquifers and monitor aquifer water quality. It is the District's intent to identify existing wells suitable for use as monitoring wells in lieu of construction of new monitoring wells.

7.4.1 Performance Standard –The District shall, within 36 months following completion of the study identified in Goal 7.3, establish a monitoring well network based on the study recommendations. The District shall report on the status of the monitor well network in each annual report prior to completion of the network. The summary will include the number of monitoring wells completed to date, the status, as a percent complete, of wells under construction, and an estimate of the overall percentage complete of the monitor well program.

7.5 Objective – The District will establish a water level and water quality monitoring program utilizing the monitoring well network completed as part of Goal 7.4.

7.5.1 Performance Standard –The District will, upon completion of each monitoring well established as part of Goal 7.4, commence regular water quality and water level monitoring. The District currently anticipates that monitoring measurements and samples will be performed on an annual basis at each monitoring well. Water level and water quality monitoring shall be reported by monitoring well in each subsequent annual report. This will include a summary of the number of wells monitored, and the number of each type of measurement taken.

8) Aquifer Storage Recovery.

8.1 Objective – The District will develop a five-year Action Plan for implementation of Aquifer Storage Recovery. The action plan will include a list of actions and expenditures appropriate for continued implementation of ASR within the District. Following development of the initial action plan, the action plan will be updated at approximately two to three year intervals as circumstances warrant and as the District Board may direct.

8.1 Performance Standard – The District will develop the initial action plan within one year of approval of this management plan by TWDB. The initial action plan will be published as part of the District's first annual report. Updates to the action plan will be published as part of future annual reports.

At this time, the District has determined that the following goals and objectives are not appropriate or cost-effective and therefore the District has determined them to be not applicable at this time.

9) Recharge Enhancement.

10) Rainwater Harvesting.

11) Precipitation Enhancement.

12) Brush Control.

13) Addressing in a Quantitative Manner the Desired Future Conditions of the Groundwater Resource

The desired future condition of the groundwater within the District has not yet been established in accordance with Chapter 36.108 of the Texas Water Code. The District is working with the other members of GMA 15 and GMA 16 in order to identify the DFCs of the underlying aquifers by the 2010 deadline. A MAG based on the DFC will be developed by TWDB.