

# Annual Report Fiscal Year 2009



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P.O. Box 729, Belton, TX 76513

254/933-0120

Fax: 254/770-2360

# Clearwater Underground Water Conservation District Annual Report—Fiscal Year 2009

The Annual Report for Fiscal Year 2009 (FY09) was approved by the Directors of the Clearwater Underground Water Conservation District (CUWCD or District) on September 14, 2010. This report summarizes the activities and accomplishments of the District during

FY09 focusing on administrative tasks, management plan requirements, and miscellaneous activities. Most activities are based on the District's fiscal year; however, information dealing with well registration, permitting, and production are based on the 2009 calendar year.



Horace GraceWallace BiskupJudy ParkerLeland GersbachJohn MayerPrecinct 2Precinct 3Precinct 4Precinct 1At-Large

# **District Mission Statement**

Develop and Implement an efficient, economical and environmentally sound groundwater management program to protect and enhance the water resources of the District.

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# 1. INTRODUCTION

The Clearwater Underground Water Conservation District was created by the State legislature in 1989 to manage the groundwater resources of Bell County. The District was approved by the voters of Bell County in August 1999 and opened its doors for business in February 2002. Groundwater resources in Bell County include the following:

- Edwards BFZ
- Trinity
- Others:
  - o Alluvium
  - o Austin Chalk
  - o Buda
  - Edwards Equivalent
  - o Kemp
  - o Lake Waco
  - o Ozan
  - o Pecan Gap

Clearwater's fiscal year runs from October 1<sup>st</sup> through September 30<sup>th</sup>. This report summarizes the accomplishments and activities of the District during FY09; however, registration, permitting, and production figures are provided for the calendar year 2009.

During FY09, three monitoring wells were drilled in the Trinity aquifer, one in each Trinity layer. The wells were later equipped with a continuous monitoring system. The Board solicited bids to upgrade the District's stream flow gauge system in Salado Creek to automate the collection of data and the posting of the data on the District website. The upgrade also included a new file server system, automated processing and publication of rainfall data and website improvements to support the District's drought management plans. A drought management plan was adopted for the Edwards BFZ aquifer and a drought management plan for the Trinity aquifer was begun. These activities and others are discussed in this report.

The information in this report is presented in three categories as follows:

- Administrative Tasks
- Management Plan Requirements
- Miscellaneous Activities

Administrative tasks include internal administrative activities necessary for a groundwater district to function effectively. Management Plan requirements include the required tasks and activities identified in the District's Management Plan. Miscellaneous activities include other activities and programs that have been an integral part of the District but are not required by the Management Plan.

# 2. ADMINISTRATIVE TASKS

Major administrative tasks and activities during FY09 include the following:

#### A. Contracts:

- Central Texas Council of Governments
- Technical Consulting Services
  - (1) AECOM, Inc.
  - (2) Bar-W Groundwater Exploration, LLC.
- Legal Services
  - (1) Naman, Howell, Smith & Lee
  - (2) Lloyd, Gosselink, Blevins, Rochelle & Townsend, P.C.

#### **B.** Financial Items:

- Budget and Tax Rate
- Financial Audit

## C. Miscellaneous Policies/Issues:

- Revisions to Travel & Subsistence Policy
- Misclassified Wells
- Election Date Moved
- Protection of Edwards BFZ Aquifer Recharge Zone
- Request for Proposals to upgrade various functions associated with the drought management plans, file server, and website

#### **D. Board of Directors:**

- District Officers
- Meetings

#### **E. District Rules:**

- Amendment to Hydrogeological Report Requirements (aggregate well systems)
- Interpretation of Permit Exclusions and Exemptions (clarify status of reconfigured lots)
- Moratorium on Wells Proposed for Amenity Ponds

#### F. Management Plan

A detailed discussion of each of these activities follows below.

# A. CONTRACTS

#### 1. Central Texas Council of Governments

The District renewed its contract with the Central Texas Council of Governments (CTCOG) for administrative and planning services for a two year period from October 1, 2008 through September 30, 2010. Although the contract is for a two year term, consideration for renewal occurs on an annual basis to allow time for a smooth

transition should the contract not be renewed. This contract includes the use of CTCOG staff, equipment, and facilities.

The District originally contracted with CTCOG for administrative and planning services in March 2000. While this contract has proven to be beneficial for both parties, the Clearwater Board has been considering options to break from CTCOG and become a stand-alone entity. The contract was not renewed at the end of FY09 but will be re-evaluated in March 2010.

# 2. Technical Consulting Services

The District initiated a contract with AECOM, Inc. (previously TCB, Inc.) in March 2001 for technical consulting services and has continued a contractual relationship over the years. During FY09, the head geoscientist assigned to Clearwater left AECOM to establish a private consulting firm—BAR-W Groundwater Exploration, LLC. Clearwater has contracts with both AECOM and BAR-W.

Services provided by AECOM and BAR-W during FY09 included the following:

- Technical review of drilling and operating permits;
- Designation of aquifers for exempt wells and estimate of production;
- Development of revisions to the hydrogeological report guidelines;
- Coordination and oversight of geophysical logging of wells in the Lower Trinity aquifer;
- Consultation regarding appropriate sites for monitoring water levels in the Trinity aquifer, monitoring well construction guidelines, bid package preparation, bid review, and bid award;
- Oversight of the drilling of the three Trinity aquifer monitoring wells, pumping tests, and collection of water samples;
- Review of data from Salado Creek stream flow gauges and adjustments to program;
- Preparation of Request for Proposals (RFP) for upgrade to stream flow gauge system and rainfall data, file server, and website;
- Consultation regarding the Edwards BFZ recharge and transition zones, recommended approach to protecting recharge zone, and development of list of potential studies;
- Development of draft Drought Management Plan for the Edwards BFZ aquifer and related triggers;
- Development of precipitation deficit index (PDI) for use in drought management plans instead of Palmer Drought Severity Index (PDSI).

Several of the items above are discussed in more detail throughout this report.

# 3. Legal Services

The District requests legal consulting services on an as-needed basis and utilizes two law firms. Naman, Howell, Smith & Lee is contacted for general consultation, and Lloyd, Gosselink, Blevins, Rochelle & Townsend, P.C. (LGBRT) for consultation regarding water-related issues. LGBRT was the District's primary advisor during FY09 which included the following issues:

- Review of documents to include meeting agendas; monitoring well agreements; hydrogeological report guidelines; bid documents and procedures including performance and payment bonds; drilling contract for monitoring wells; drought management plans; consulting agreements; request for proposals for system upgrade; notice concerning authority to drill well; and 7KX litigation judgment.
- Application of Texas Open Meetings Act; Texas Public Information Act; and Professional Services Procurement Act.
- Protection of Edwards BFZ aquifer recharge zone and TCEQ rules; water quality issues (Bevel property).
- Preparation of legislation, coordination and monitoring of bill to amend District's enabling legislation to move election date to November.
- Review issues related to City of Temple permit request for amenity pond.

## **B.** FINANCIAL ITEMS

#### 1. Budget and Tax Rate

The District held one workshop to develop an operating budget for the upcoming fiscal year and to set the corresponding ad valorem tax rate. The District has consistently lowered or kept the same tax rate since it began assessing taxes. The adopted tax rate for FY09 was \$0.0040/\$100 valuation, the same rate as the previous fiscal year. The approved budget for FY09 totaled \$537,700 with \$521,664 anticipated revenue from taxes. The budget was administratively revised to allow for an FY08 purchase that was moved to FY09. This resulted in a revised budget of \$542,913. FY08 funds were moved to FY09 to cover this purchase.

Expenditures for FY09 totaled \$542,330--\$583 under budget. However, total revenue (including interest and fees) collected during FY09 was lower than anticipated at \$526,064 (\$16,849 less). The resulting shortage was taken from the reserve account leaving a carry over balance at the end of FY09 of \$532,390.

The approved budget for FY09, along with the ending schedule of revenues and expenditures for FY09, is attached as Appendix M. Appendix M also includes a piechart that breaks down expenditures by category. The figures shown in the final report include a \$553,869 reserve balance or carry over from years prior to FY09.



## 2. Financial Audit

An annual audit of the District's finances is required by Chapter 36.153 of the Texas Water Code. Clearwater's audit occurs in conjunction with CTCOG's audit. The fiscal year for CTCOG runs from July 1<sup>st</sup> through June 30<sup>th</sup>. Patillo, Brown & Hill, LLP is conducting the CTCOG audit, with Clearwater as a part of the CTCOG audit. There were no findings to report for the FY08 audit; the FY09 audit is underway.

# C. MISCELLANEOUS POLICIES/ISSUES

## 1. Revisions to Travel and Subsistence Policy

The Clearwater Board revised the Travel and Subsistence Policy in December 2008. The changes are summarized below:

- Deletes requirement that employees and directors obtain prior approval for out of district travel.
- Clarifies that employees and directors may travel from airport of choice rather than being limited to the nearest airport.
- Allows for reimbursement of mileage to transport an employee or director between their residence and the airport provided it is less expensive than parking at the airport.
- Allows directors to be reimbursed for mileage accrued while conducting District business regardless if travel originates from their residence or the District office.
- Clarifies that mileage reimbursement is allowed for out of state travel and does not require travel via air.
- Deletes requirement that proof of auto insurance is on file with the District but requires employees and directors to carry the state mandated minimum insurance coverage on any vehicle being used for District business.

#### 2. Misclassified Wells

During FY07 and FY08, Staff identified several wells that had been misclassified as exempt. The Board agreed to waive the application fee and pay the costs associated with public notification for these wells; however, a policy as to how to address future

situations of misclassified wells was not established. During FY09, additional misclassified wells were identified and the Board agreed to set previous policy as the standard policy for dealing with these situations, unless staff determines that the situation warrants Board review.

## **3.** Election Date Moved

During FY09, Clearwater proposed a bill to amend its enabling legislation to move its election date from May to November. This move was desired to enable Clearwater to "piggy-back" on the County elections held in November, thereby saving tax-payer dollars. There is also typically a higher voter turn-out for the November elections. The bill, Senate Bill 1755, was approved by the 81<sup>st</sup> State Legislature and was signed by Governor Perry on May 19, 2009. The bill was effective immediately and will come into play with the 2010 election.

## 4. Protection of Edwards BFZ Aquifer Recharge Zone

Discussions regarding the protection of the Edwards BFZ aquifer recharge zone began in FY08 and continued into FY09. Bell County is the only county with the Edwards BFZ aquifer that has not adopted the Texas Commission on Environmental Quality (TCEQ) Edwards Aquifer Rules. During FY09, the Board concurred they did not feel it appropriate to pursue the TCEQ rules but opted for a different plan of action to include the following:

- Increase District visibility and awareness of current rules regarding recharge protection; coordinate with other governmental entities as they review new developments over the recharge zone.
- Meet with stakeholders and reach consensus on appropriate approach.
- Conduct studies to better understand the recharge zone and locate recharge features; seek support from stakeholders to gather information about recharge features.
- Develop campaign to enhance recharge and actively promote recharge enhancement practices along with non-point source pollution awareness and watershed protection concepts.

A stakeholders meeting was held in Salado on September 22, 2009. Approximately 25 individuals attended. A list of proposed studies was presented at the meeting. The District budgeting \$27,500 to conduct four of these studies during FY10. Task Orders with BAR-W Groundwater Exploration, LLC to conduct these studies were approved in FY10 with a completion target date of September 30, 2010. These studies are as follows:

--Identify geologic structures in the recharge zone and transition zones.

--Select wells for water level measurements; prepare contour map of the aquifer.

--Select wells for 3 pumping tests; evaluate results.

--Select 10 wells near eastern aquifer boundary for water quality testing; evaluate results.

# 5. Request for Proposals to upgrade various functions associated with the drought management plans, file server, and website

During the latter part of FY09, the Board concurred that it would be beneficial to automate the collection and processing of data from the Salado Creek stream flow gauges to make it easily accessible to the public on the District website. This grew to include the automation of rainfall data, which, along with the information from the stream gauges, is used in the District management plans. Replacement of the Clearwater server and website upgrade were included as well.

A Request for Proposals (RFP) was developed by BAR-W Groundwater Exploration, LLC and the RFP was published September 21, 2009. Three proposals were received. The proposals were evaluated, and the contract was awarded to Hamson Consulting during the latter part of 2009. Completion of this project is anticipated by May 1, 2010.

## **D. BOARD OF DIRECTORS**

#### **1. District Officers**

District Officers for FY09 were designated at the last meeting of FY08. The FY09 officers are identified below, along with the office they held and precinct they represent.

Horace Grace, President (Precinct 2) Wallace Biskup, Vice President (Precinct 3) Judy Parker, Secretary (Precinct 4) Leland Gersbach, Director (Precinct 1) John Mayer, Director (At-Large)

Following is a map of the Bell County Commissioner Precincts which also serves as the precinct boundaries for the District.



#### 3. Meetings

The Board of Directors held 12 Board meetings and three workshops during FY09. The workshops included discussion of the following: City of Killeen Tax Increment Reinvestment Zone; Pendleton Water Supply Corporation plans to increase production from permitted wells; protection of Edwards BFZ aquifer recharge zone; District Strategic Plan; FY10 budget; and FY08 Annual Report. Board meetings are typically held on the third Tuesday of each month.

#### **E. DISTRICT RULES**

No revisions to the District rules were adopted during FY09; however, there were changes to related guidelines and policy interpretations as summarized below:

#### 1. Amendment to Hydrogeological Report Requirements

District Rule 8.9.2(e) requires submittal of a hydrogeological report under certain conditions, to include requests to operate a nonexempt well with an annual permitted use of more than 37 acre-feet. Guidelines did not address how to apply the guidelines when there are multiple wells involved.

The amendment clarifies that a pumping test is required at each well site, unless the applicant can present evidence to the contrary. The evidence is to be reviewed by the

District Manager who will consider the evidence and either make a determination on the matter or refer the matter to the Board for their determination as to whether the available evidence is sufficient to avoid the re-testing of certain system wells.

## 2. Interpretation of Permit Exclusions and Exemptions

Clarification of District Rule 8.3 Permit Exclusions and Exemptions was requested with regard to subsection (a) (2) and (3) to clarify the status of a well when a lot has been reconfigured by either moving a lot line or consolidating lots. The Board concurred that if the reconfiguration does not result in additional lots being created, the tract of land retains its eligibility for a permitting exception. The Board further concluded that situations such as these in the past where the applicant was required to obtain a permit may now be reclassified to exempt well status.

# 3. Moratorium on Wells Proposed for Amenity Ponds

In response to prolonged drought conditions, the Clearwater Board considered enacting a temporary moratorium on new permits for wells proposed for filling surface impoundments such as amenity ponds. The high evaporation rate of these features posed a serious concern during the drought. The Board discussed this issue and agreed not to impose a formal moratorium but to request voluntary compliance with this position until drought conditions improved.

# F. MANAGEMENT PLAN

No changes were made to the District's Management Plan during FY09. Managed Available Groundwater (MAG) figures that were developed for the Edwards BFZ and Trinity aquifers through the joint planning process by Groundwater Management Area 8 will be included in the District Management Plan when the next five year update occurs in 2011.

Groundwater districts may be audited by the State every seven years to determine if the District is actively engaged in achieving the objectives of its management plan. The Clearwater District has not yet been audited. A detailed discussion of the District's Management Plan activities based on the 2006 approved Plan is included later in this report.

# 3. MANAGEMENT PLAN REQUIREMENTS

The District Management Plan identifies the goals and objectives of the District and provides performance standards and tracking methods to measure the District's effectiveness in meeting these goals. The District goals are mandated by Texas Water Code Chapter 36, Section 36.1071. Although all groundwater conservation districts are subject to these goals, each district chooses how to best implement the goals within their district by establishing their own objectives and performance standards. The District goals are as follows:

- Providing the most efficient use of groundwater;
- Controlling and preventing waste of groundwater;
- Addressing conjunctive surface water management issues;
- Addressing natural resource issues which impact the use and availability of groundwater, and which are impacted by the use of groundwater;
- Addressing drought conditions;
- Addressing conservation, recharge enhancement, rainwater harvesting, precipitation enhancement, or brush control where appropriate and cost-effective; and
- Addressing in a quantitative manner the desired future conditions of the groundwater resources.

The following is a summary of the District's activities related to these goals.

# A. PROVIDING THE MOST EFFICIENT USE OF GROUNDWATER

# **Objectives A.1 and A.2: Registration & Permitting of Wells.**

## **Objective Satisfied**

The registration and permitting of wells is an ongoing process. During calendar year 2009, 69 wells were registered, and 12 of these wells were non-exempt. The tables below summarize the well registration and permitting activity through December 31, 2009.



Period	Exempt We	lls	Non-Exempt Wells*				Total
	Grandfathered	New	Grandfathered	New	New I	New II	
2002	3520	76	50	0	0	0	3646
2003	379	80	4	2	0	0	465
2004	18	82	15	1	1	1	118
2005	22	91	13	-	1	3	130
2006	16	80	5	0	0	3	104
2007	22	52	4	-	6	2	86
2008	11	44	4	-	2	4	65
Jan	0	2	0	-	0	0	2
Feb	1	5	0	-	0	0	6
Mar	1	8	0	-	0	1	10
Apr	1	4	0	-	0	0	5
May	0	1	0	-	0	1	2
Jun	3	1	0	-	2	1	7
Jul	1	4	0	-	0	0	5
Aug	3	7	0	-	2	0	12
Sep	0	0	0	-	0	1	1
Oct	4	8	0	-	0	0	12
Nov	0	0	1	-	0	3	4
Dec	1	2	0	-	0	0	3
2009 Total	15	42	1	-	4	7	69
Grand Total	4,003	547	96	3	14	20	4,683

# Well Registration Summary 2002 through 2009

\*Effective March 1, 2004, the District began designating new non-exempt wells as either Classification 1 or Classification 2 as follows:

Classification 1:

- a. A well used for domestic purposes or for watering livestock or poultry;
- b. drilled, equipped or completed so it is incapable of producing more than 25,000 gpd (17 gpm); and
- c. located on a tract of land less than 10 acres in size, created after March 1, 2004.

**Classification 2:** 

- a. A well used for purposes other than domestic, livestock or poultry, regardless of production; or
- b. a well drilled, equipped or completed so it is capable of producing more than 25,000 gpd (17 gpm), regardless of the use.

Well registration totals overtime may no longer accurately reflect the number of wells actually drilled into the ground. This is because some of the registered wells are never drilled or have been plugged. Additionally, some exempt wells may be converted to a non-exempt well at a later date. The table below shows a more accurate reflection of the number of wells on the ground.

Type of Adjustment	Exempt Wells		1	Non-Exer Wells	npt		
	Grandfathered	New	Grandfathered	New	New I	New II	Accumulative Total
Total as of 2009	4,003	547	96	3	14	20	4683
Exempt to Non-Exempt Status <sup>1</sup>	-6	-7	+11	0	-1	+3	0
Never Drilled <sup>2</sup>	0	-8	0	0	0	-4	-12
Plugged <sup>3</sup>	-51	-10	-8	0	0	0	-69
Total	3946	522	99	3	13	19	4602

# Well Registration Adjustment Table

Adjustments made in 2009

<sup>1</sup> N1-07-004P to E-09-043G

<sup>2</sup> N2-09-003P

<sup>3</sup> N2-06-009G, N2-05-002G, N2-05-006G, N2-04-005G, E-08-048P, E-08-046G, E-07-038P, E-03-131G

As we have seen in recent years, registration figures for 2009 show that the majority of exempt wells registered are new wells. With regard to non-exempt wells, 2009 was similar to 2008 and 2007 in that the majority of wells registered were new wells.

# **Exempt Well Registration-2009**



Existing Wells
New Wells





Existing Wells
New Wells

The Table below summarizes the non-exempt wells that were registered during 2009 and the corresponding permits that were issued where applicable.

File No.	Well Owner/	Ac-ft/	Aquifer	Use	Permit Type
	Land Owner	Year			
			Edwards		Converted to
N1-09-001P	Jimenez	0.33	BFZ	Domestic	Exempt
			Edwards		Converted to
N1-09-002P	Jimenez	0.33	BFZ	Domestic	Exempt
	Gehring		Trinity		Drilling &
N1-09-003P	(Prev. Thornhill)	0.34	(Middle)	Domestic	Operating
			Edwards		Drilling &
N1-09-004P	Rivera	0.53	BFZ	Domestic	Operating
			Trinity		Drilling &
N2-09-001P	Brocket	12.32	(Middle)	Irrigation	Operating
			Edwards		Drilling &
N2-09-002P	Lowery	1.84	BFZ	Irrigation	Operating
			Trinity	Irrigation &	
N2-09-003P	City of Temple	5.37	(Middle)	Amenity Pond	Withdrawn
	Salado United		Edwards		
N2-09-004G	Methodist Church	0.86	BFZ	Irrigation	Operating
			Trinity		
N2-09-005G	RS Materials	11.17	(Lower)	Industrial & Office	Operating
			Trinity		
N2-09-006P	CUWCD	n/a	(Upper)	Monitoring	n/a
			Trinity		
N2-09-007P	CUWCD	n/a	(Middle)	Monitoring	n/a
			Trinity		
N2-09-008P	CUWCD	n/a	(Lower)	Monitoring	n/a
			Trinity		
*N2-08-006P	Moffat WSC	55.24	(Lower)	Public Supply	Drilling

# Non-Exempt Wells Registered/Permitted During Calendar Year 2009

\*Application was received in 2008; permit approved in 2009.

During 2009, five entities in Bell County transported groundwater outside the District. A total of 12.54 ac-ft from the Edwards BFZ aquifer was transported and 34.72 ac-ft from the Trinity aquifer was transported. This showed a slight decrease in the transport out of the Edwards BFZ which in 2008 was at 12.97 ac-ft, but slightly up for the Trinity which saw 32.46 ac-ft transported in 2008. The District is allowed by state law to charge a transport fee of

\$0.025/\$1,000 gallons transported. This generated total revenue of \$385.00 for 2009. A summary of transport activity for 2009 is shown in the following chart.

Entity	Well Number	Aquifer	Destination	Gallons	Transport
(Water Supply Corp.)			(County)		Fee
		Edwards			
Jarrell Schwertner	N-02-042G	BFZ	Williamson	4,085,200	\$102.13
	N-02-038G &	Trinity	Falls, Milam,		
Bell-Milam-Falls	N-02-046G	(Hosston)	Williamson	9,667,300	\$241.68
		Trinity			
Little Elm Valley	N-02-039G	(Hosston)	Falls	863,820	\$21.60
		Trinity			
East Bell	N-02-034G	(Hosston)	Falls	571,660	\$14.29
		Trinity			
Oenaville & Belfalls	N-02-017G	(Hosston)	Falls	212,038	\$5.30
Total				15,400,018	\$385.00

#### Summary of Groundwater Transport for 2009

## **Objective A.3: Maintain a Groundwater Database.**

#### **Objective Satisfied**

The District's database is continually updated as new information is acquired.

1. Groundwater Production:

The District continued collecting data from non-exempt wells during 2009. Monthly production reports are required by the 10<sup>th</sup> day of the following month for all wells with operating permits. The tables below show the total permitted amount for the non-exempt wells and their total production. In 2009, actual water production figures were significantly lower than the amount permitted. Part of this is due to the issuance of Historic and Existing Use Permits (HEUP). The HEUPs are issued for the full permit amount, regardless of whether the permittee will be using this amount during the year.

2009 Permitted Volume for Non-Exempt Wells								
Edwards BFZ:	2,562.28 ac-ft (41 wells)							
Trinity:	1,960.48 ac-ft (44 wells)							
Other Aquifers:	311.58 ac-ft (14 wells)							
TOTAL:	4,834.34 ac-ft (99 wells)							

2009 Annual Production from Non-Exempt Wells								
Edwards BFZ:	1,833.82 ac-ft (38 wells)							
Trinity:	913.63 ac-ft (39 wells)							
Other Aquifers:	197.56 ac-ft (10 wells)							
TOTAL:	2,945.01 ac-ft (87 wells)							

The following chart shows 2009 production by month and aquifer. Production was at its highest level during the month of June with a monthly withdrawal of 525 ac-ft. This is up considerably from the previous year which saw a peak in production of 447 ac-ft during the month of June. Throughout the year, withdrawals from the Edwards BFZ were consistently higher than from the Trinity aquifer. Production from Other source aquifers was minimal throughout the year except for the month of June when it notably exceeded the monthly production for the Trinity aquifer.



#### Production From Non-Exempt Wells--2009

In the following graph, production from 2009 (87 wells) is shown compared to production in years 2003 through 2008. Production in 2009 was very similar to the previous year likely due to dry conditions experienced during 2008 and 2009 as opposed to the abundant rainfall received during 2007.



# Production From Non-Exempt Wells 2003-2009

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The following pie charts show how the groundwater from the different aquifers was used during 2009. In the Edwards BFZ and Trinity aquifers, water produced from non-exempt wells is used primarily for public supply purposes (86.8% and 77.0% respectively), while water produced from non-exempt wells in other formations was used primarily for agricultural use.



#### 2009 Use of Groundwater By Non-Exempt Wells –Edwards BFZ Aquifer

Each year, the exempt wells that have been registered are evaluated, the aquifer from which they are producing is determined and an estimate of their total annual production is provided. The results are shown below for exempt wells registered through December 31, 2009.

Domestic .3%

Aquifer	No. of Wells	Estimated Use Acre-feet/Year
Edwards BFZ	671	451
Trinity	1,858	1,236
Other Aquifers	1,918	1,281
TOTAL	4,447	2,968

\*Summary of Exempt Well Production

\*Calculations for exempt well production excluded wells that were plugged, monitor wells, and wells that were never drilled.

Combining the production from the non-exempt wells with the estimated production from the exempt wells, the following production figures result:

Aquifer	Non-Exempt Well Production (Ac-Ft/Year)	% of Total	Estimated Exempt Well Production (Ac-Ft/Year)	% of Total	Total Production (Ac-Ft/Year)
Edwards (BFZ)	1,834	80%	451	20%	2,285
Trinity	914	43%	1,236	57%	2,150
Other Aquifers	197	13%	1,281	87%	1,478
TOTAL	2,945	50%	2,968	50%	5,913

# **Production Summary for All Wells**

The chart above shows that overall, exempt wells account for 50% of all the groundwater produced in Bell County. In the Trinity, 57% of production is attributed to exempt wells; however, in the Edwards BFZ, exempt wells only account for 20% of groundwater production, with the vast majority coming from non-exempt wells. During 2009, 87% of the production from wells producing from other groundwater sources is attributed to exempt wells.

Overall, production from the Edwards BFZ aquifer accounts for 39% of total groundwater used in Bell County, with the Trinity aquifer accounting for 36%, and other aquifers accounting for 25%.

#### 2. Aquifer Monitoring:

The Texas Water Development Board (TWDB) typically measures water levels in selected wells in January each year. Clearwater measures water levels in selected wells twice annually (January and July). Beginning with FY09, Clearwater staff took over measurements for six of the eight wells measured by the TWDB.

The following pages are tables that provide a summary of the monitoring data. Refer to Appendix A for a map of the aquifer monitoring sites. **NOTE: Larger numbers represent greater depth necessary to reach the surface of the aquifer, i.e. a decline in the aquifer level.** Numbers in red were taken by the TWDB, whereas numbers in blue were taken by the District. Comparing the water level measurements taken by the District with those taken by the TWDB is sometimes difficult due to differences in measurement procedures and equipment. The District primarily uses an e-line; an airline is used if the well is equipped with one. Large producers are asked to turn the pump off at least one hour prior to the measurement to allow the aquifer levels time to stabilize. The TWDB typically uses a steel tape or an airline and does not request the pump to be turned off.

# Edwards (BFZ) Aquifer

Water Level- Depth Below Land Surface in Feet										
	Date of Measurement									
	Jan-Mar		Jan-Feb				Jan-Feb		Jan-Feb	

Well Number	Other	Jan-Mar 03	Jul-03	Jan-Feb 04	Jul-04	Jan-05	Jul-05	Jan-Feb 06	Jul-06	Jan-Feb 07	Jul-07	Jan-08	Jul-08	Jan-09	Jul-09
58-04-627 (Salado ISD)		39.8	42.6	41.42	39.54	39.05	43.42	43.34	43.58	40.84	36.17	41.92	43.59	43.42	51.5
58-04-502 (Salado ISD)	(1985) 50.5	48.7	56.14	49.17	48.58	47.16	51.83	51.79	52.08	49.5	44.83	49.83	52.16	51.58	53.66
58-04-602 (Salado WSC)	(1981) 29.27	63.2	38.17 <sup>1</sup>	29.5 <sup>1</sup>	32.71 <sup>1</sup>	27.17 <sup>1</sup>	36.00 <sup>1</sup>	36.5 <sup>1</sup>	41.84 <sup>1</sup>	27.55 <sup>1</sup>	21.50 <sup>1</sup>	31.42 <sup>1</sup>	40.17 <sup>1</sup>	38.92 <sup>1</sup>	34.92 <sup>1</sup>
58-13-502 (City of Bartlett)		-				42.62	40.13	50.29	52.29 <sup>1</sup>	60.79 <sup>1</sup>	49.45 <sup>1</sup>	46.62 <sup>1</sup>	46.46 <sup>1</sup>	61.04 <sup>1</sup>	63.33 <sup>1</sup>
58-04-623 (Foster Stgch)	(1993) 85.39	85	89.58 <sup>1</sup>	89.69	82.79 <sup>1</sup>	86.3	87.17 <sup>1</sup>	83.00 <sup>1</sup>	95.25 <sup>1</sup>	80.30	72.34	86.51 <sup>4</sup>	72.34 <sup>1</sup>	88.75 <sup>1</sup>	85.67 <sup>1</sup>
58-04-628 (Cemetery) <sup>2</sup>														71.91 <sup>3</sup>	83.61 <sup>3</sup>
58-04-702 (TxDOT) <sup>2</sup>	(1980) 71	78.25	71.96	72.72	71.84	72.2	72.17	72.83	72.73 <sup>3</sup>	72.08 <sup>3</sup>	69.87 <sup>3</sup>	72.07 <sup>3</sup>	69.82 <sup>3</sup>	72.88 <sup>3</sup>	73.19 <sup>3</sup>
58-04-816 (TxDOT) <sup>2</sup>		-										-	124.80 3	125.47 3	128.15 <sup>3</sup>
58-04-801 (Norwood)	(1966) 134.93	144.15	137.42	141.34	141.25	134.1	137.58	140.25	140.5	137.7	133.08	135.70	138.91	150.75	143.25
CUWCD															

<sup>1</sup> Pump turned off at least 1-2 hours prior to measurement

TWDB measurement measurement

<sup>2</sup> Continuous monitor equipment installed (data available: http://hyper20.twdb.state.tx.us/twdbwells/twdbwells.html)

<sup>3</sup> Daily trend from continuous monitor site on date of water level measurements (Jul-09 daily trend for July 8th 2009)

<sup>4</sup> Pump in use less than one hour prior to measurement

Well Number	Date of Measurement														
	Other	Jan-Mar 03	Jul-03	Jan-Mar 04	Jul-04	Jan-05	Jul-05	Jan-Feb 06	Jul-06	Jan-Feb (	Jul-07	Jan-08	Jul-08	Jan-09	Jul-09
E-02-721G (McCallum #1)										145.5	132.42	135.67	153.00	146.59	160.84
E-02-722G (McCallum #2)										145.00	131.92	135.17	152.25	145.83	160.25
E-02-804G (Dobson)										335.75	324.50	328.71	338.92	356.42	359.83
E-02-1137G (Stephenson/Bowen)					311.42	not taken	not taken	335.73 <sup>2</sup>	342.66 <sup>2</sup>	363.45 <sup>2</sup>					
E-08-005P (Stephenson)														369.54	378.46
E-02-1299G (Mayer)				182.1	189	180.38	201.72	200.62 <sup>2</sup>	227.18 <sup>2</sup>	183.29 <sup>2</sup>	217.94 <sup>2</sup>	204.08 <sup>2</sup>	229.49 <sup>2</sup>	266.45 <sup>2</sup>	201.77 <sup>2</sup>
N2-05-008G (River Ridge Ranch East Dam Well)										164.58	138.50	144.87	181.00	184.66	202.13
E-06-063P (Texas Veterans Land Board)										375.25	379.58	382.50	442.33	389.58	370.17
E-03-444P (Purnell)										411.92	400.58	411.58	434.42	429.67	446.58
E-05-083P (Murphy)										282.63	288.42	291.92	334.42	323.76	368.58
N2-07-003G (Killeen Crushed Stone)												344.42	376.17	377.92	377.25
40-53-102 (USCOE- Leona Park)	(1993) 55.14	68.35	70.42	71.28	71.92	72.6	73.33	74.16	74.5	75.35		76.55	77.66	78.98	78.71
58-05-901 (City of Holland)	(1995) +1.2 (flowing)	23.7	25.3	26.19	28.21	29.9	31.84	25.96	28.3	26.1	27.04	28.80	30.79	34.04	36.63
40-45-701 (USCOE-Winkler Park)		bad reading		bad reading	326.09	bad rding		333.29	335.54	ad reading			344.63	349.46	352.88
40-53-406 (Moffat WSC)	(1967) 243.55	335	417.83 <sup>1</sup>	336	416.06 <sup>1</sup>	340	not avail.	not avail.	not avail.	333	381.26	332.00	358.16	436.70	358.16
40-63-501 (East Bell WSC)	(1962) +13.5 (flowing)								130 <sup>3</sup>	155 <sup>3</sup>	150 <sup>3</sup>	125 <sup>3</sup>	155 <sup>3</sup>	125 <sup>3</sup>	
N2-05-010G (River Ridge Ranch Common Park)										266.88	256.25	261.92	280.17	284.25	293.58
<sup>1</sup> Pump turned off at least 1-2 hours prior to measurement TWDB measurement CUWCD measurement															
<sup>2</sup> Method of measurement was airline															
<sup>3</sup> Measurement was reported by East Bell WSC				Upper Trinity	(Glen Ro	ose)		Middle Trinity	(Hensell)			Lower Trin	ity (Hoston)		

Trinity Aquifer Water Level- Depth Below Land Surface in Feet

Of the nine Edwards wells that were measured during 2009, all but one showed a decrease in water level from 2008. Likewise, 16 wells were measured in the Trinity aquifer and of these, all but two noted a decrease in water level from 2008. These findings are consistent with expectations considering the drought conditions that began in 2008 and continued on into 2009. Some of the wells that are measured are pumped; therefore, measurements taken may not reflect static water levels.

The data for some of the TWDB well sites and a few of the sites measured by the District for both the Edwards BFZ and Trinity aquifers are shown in the following charts.



Water Levels from Edwards (BFZ) Monitor Wells in Bell County



Water Levels from Middle Trinity Monitoring Wells in Bell County

The District continues to search for additional well sites to expand its monitoring system. Of the 28 wells measured during 2009, six are equipped with a continuous monitoring system. Three of these wells are in the Edwards BFZ aquifer. The first Edwards BFZ aquifer site was equipped during 2006, the second was equipped in the spring of 2008, and the third was equipped December 2008.

Clearwater drilled three wells in the Trinity aquifer for monitoring purposes during 2009. Two wells are located on City of Copperas Cove property with one well in the Middle Trinity and one in the Lower Trinity, and one well in the Upper Trinity is located on Central Texas College property. These wells were equipped with a continuous monitoring system in December 2009/January 2010.

# Objective A.4: Education—Water Cycle and Aquifer Status

# **Objective Satisfied**

The District's Management Plan requires the dissemination of educational information regarding the water cycle and the status of the aquifers through at least two outreach methods/activities. During FY09, the District satisfied this requirement as follows:

Water Cycle:

1) The District published a newspaper article in April 2009 that included a summary and graphic of the water cycle. This article was published in the following newspapers:

Killeen Daily Herald:	April 19, 2009
Temple Daily Telegram:	April 19, 2009
Salado Village Voice:	April 16, 2009

2) Splash Activity Books are geared toward 3<sup>rd</sup> grade level students and focus on the water cycle as well as water awareness and water conservation. FY09 was the third year the District distributed the Splash Activity Book. This book is published by the American Water Works Association. During the spring of 2009, orders were taken for 3,560 students in the Killeen, Temple, and Belton school districts. The Splash books were delivered to the schools in September of 2009. A list of participating schools is provided in Appendix B, Activity Reports.

# Aquifer Status:

- 1) The District publishes information on the status of Bell County's aquifers on the District's website. For FY09, this information included water level measurements for nine Edwards BFZ wells and sixteen Trinity wells. This information is continually updated as new measurements and wells are added.
- 2) The District published its annual newsletter in September 2009 that included graphs depicting changes in the aquifer levels for four Edwards BFZ wells and one Trinity well.

## **B.** CONTROLLING AND PREVENTING WASTE OF GROUNDWATER

# **Objective: Water Quality Protection.**

## **Objective Satisfied**

The District's Management Plan requires the dissemination of educational information on eliminating and reducing the wasteful use of groundwater. It focuses on water quality protection through at least two outreach methods/activities. During FY09, the District satisfied this requirement as follows:

1) Well Plugging Demonstrations

The District sponsored two well plugging demonstrations during FY09. The first was held on December 3, 2008 at 3813 Riggs Road located southeast of Temple and featured a large diameter hand dug well. The second event was held on June 4, 2009 at 717 West Loop 121 in Belton and featured a drilled well. The Texas AgriLife Extension partnered with the District in these events.

The demonstrations showed the proper way to plug a well and emphasized the importance of plugging abandoned wells to prevent groundwater contamination. Approximately 15 to 20 people attended each event.



Well Plugging Demo—Hand Dug Well December 3, 2008 Riggs Road, Temple



Well Plugging Demo—Drilled Well June 4, 2009 West Loop 121, Belton

2) Classroom Presentations

Clearwater staff conducted several classroom presentations during the year that included a segment on non-point source pollution. The presentation consisted of a powerpoint presentation and a groundwater model to demonstrate groundwater basics and the impact of non-point source pollution on both groundwater and surface water. Presentations were given to the following schools:

Killeen ISD -	Nolanville Elementary
	Peebles Elementary
	Bellaire Elementary
Temple ISD -	Temple High School Accelerated Academy
Belton ISD -	Leon Heights Elementary
Holland ISD -	Holland Elementary
Private -	St. Mary's Catholic School in Temple

Refer to Appendix B for a complete list of items distributed during these events.

# C. ADDRESSING CONJUNCTIVE SURFACE WATER MANAGEMENT ISSUES

# **Objective:** Participate in Regional Water Planning Process.

#### **Objective Satisfied**

The District's Management Plan requires participation in the regional planning process by attending a minimum of two meetings of the Brazos G Regional Water Planning Group per fiscal year. During FY09, the District satisfied this requirement as follows:

Six regular Region G meetings were held during FY09 as follows: October 29, 2008; December 3, 2008; February 18, 2009; April 15, 2009; June 17, 2009; and August 19, 2009. District staff and/or directors attended four of these meetings—December and February meetings were not attended. Meeting agendas are shown in Appendix C.

## D. ADDRESSING NATURAL RESOURCE ISSUES WHICH IMPACT THE USE AND AVAILABILITY OF GROUNDWATER, AND WHICH ARE IMPACTED BY THE USE OF GROUNDWATER

# **Objective: Monitor Water Quality.**

#### **Objective Satisfied**

The District's Management Plan requires monitoring of water quality by obtaining and testing water samples from at least six wells within the District. The District has an in-house water quality lab and offers free testing service to registered well owners. Testing parameters include coliform bacteria; alkalinity; conductivity/total dissolved solids; fluoride; hardness; nitrate; nitrite; pH; phosphate; and sulfate. During FY09, the District satisfied this requirement as follows:

Wells Tested		Date	Formation
E-02-016G		09/08/09	Alluvium
E-02-144G		09/08/09	Austin Chalk
E-02-144G		09/23/09	Austin Chalk
E-02-0537G		08/25/09	Upper Trinity
E-02-0832G		08/25/09	Upper Trinity
E-02-1364G		09/23/09	Lower Trinity
E-02-3141G	(2 samples)	09/23/09	Alluvium
E-02-092P	(2 samples)	03/24/09	Middle Trinity
E-05-092P	(2 samples)	04/14/09	Middle Trinity
E-05-092P	(4 samples)	04/20/09	Middle Trinity

Wells Tested		Date	Formation
E-05-092P	(2 samples)	05/26/09	Middle Trinity
E-09-007G		01/30/09	Lower Trinity
E-09-023G	(2 samples)	06/04/09	Upper Trinity
E-09-023G		06/05/09	Upper Trinity
E-09-036G		08/18/09	Alluvium
E-09-038G		08/25/09	TBD
N1-08-001P		01/30/09	Lower Trinity
N2-08-004P		04/14/09	Edwards BFZ
N2-09-001P		05/05/09	Middle Trinity
N2-09-006P		08/10/09	Upper Trinity
N2-09-007P		08/10/09	Middle Trinity
N2-09-008P		08/10/09	Lower Trinity

Staff conducted 30 testing events that included 17 different wells. Of these wells, three were Alluvium wells, one was Austin Chalk, one was Edwards BFZ, four Upper Trinity, three Middle Trinity, and four Lower Trinity and one Undetermined. In addition, seven tests were conducted on water samples that were not from water wells. A summary of the well testing results and a location map of the well sites are shown in Appendix D.

# E. ADDRESSING DROUGHT CONDITIONS

# <u>Objective E.1: Palmer Drought Severity Index Map and Drought Preparedness Council</u> <u>Situation Report.</u>

#### **Objective Satisfied**

As required by the District's Management Plan, each month staff downloads updated data from the Palmer Drought Severity Index (PDSI) map and checks for updates to the Drought Preparedness Council Situation Report (Situation Report) that is posted on the Texas Water Information Network website. This information is presented to the Board and is included in Appendix E. During 2009, the Palmer Drought index ranged from Severe Drought to Moderately Wet. The index reached the highest reading for the region for the year at Moderately Wet by November 2009. The index reading reduced to the lowest category reading of the year of Severe Drought by July. Conditions then stabilized for a "Moderately Moist Spell" category level through December 2009.

During FY09, the District continued to monitor rainfall that was recorded or observed by Doppler radar by the National Weather Service (NWS) and the National Oceanic and Atmospheric Administration. Each month, the District downloaded the GIS files that contain the rainfall data. The data is mapped and provided for the public over the District's website and at Board meetings. This information will be used in conjunction with Salado Spring flow data for implementation of a Drought Contingency Plan. The chart below shows the average total rainfall in Bell County by month. The average is generated from the 206 data points that are spaced approximately 2.5 miles apart.



Month

**2005 2006 2007 2008 2009** 

The total average rainfall in Bell County for 2009 was 33.17 inches. This represented a drastic increase to the total amount received in 2008 at 21.08 inches. However, total average rainfall for Bell County for 2009 was a slight decrease when compared to the total average rainfall for year 2007 at 45.04 inches. Historically average annual rainfall in Bell County is approximately 34 inches, confirming 2009 rainfall as unusually average compared to the past five years. During 2009, rainfall was focused mainly in September and October. The remaining months recorded considerably less rainfall ranging from 0.43 inches to 3.90 inches for 2009. Bell County progressed from a severe drought to a moderately wet rating and then stabilized at moderate moist spell rating in 2009 according to the Palmer Drought index. Appendix F contains a map of the yearly rainfall totals for the 206 data points.

# **Objective E.2: TWDB Continuous Monitoring Wells.**

# **Objective Satisfied**

The District's Management Plan requires monitoring of drought conditions by reviewing data from the TWDB monitor wells in Bell County that are equipped with a continuous monitoring system. During 2009, TWDB installed continuous monitoring equipment in State Well No. 58-04-628 drilled in the Edwards BFZ aquifer in the Salado Cemetery. Monitoring of the well began on December 9, 2008. This brought the number of continuous monitoring wells in the Edwards BFZ aquifer to three. The first well equipped for monitoring was State Well No. 58-04-00 on FM 2843 near the Hidden Springs Subdivision of which monitoring began May 4, 2006. The second well was State Well No. 58-04-816 located along the southbound lanes of I35 at the Salado rest stop. Monitoring of this well began on May 6, 2008.

During 2009, Clearwater drilled three monitoring wells in the Trinity aquifer in western Bell County, one in each layer of the Trinity. TWDB equipped two of the wells (Middle and Lower Trinity) with continuous monitoring equipment which began recording water levels on December 14, 2009. The third well (Upper Trinity) began recording data in January 2010.

Clearwater is considered a Cooperator with the TWDB in providing monitoring well data. Data from the wells is tied into the TWDB satellite system and is available for viewing on their website.

The graphs below show the data collected by the continuous monitor wells in the Edwards BFZ. Measurements are collected every hour. The readings show an overall increase in 2009. Water level readings ranged from 73.33 ft. below land surface (BLS) on September 10, 2009 to 69.44 ft. BLS on November 15, 2009 representing a 3.89 foot increase in water level during this period. The average reading during 2009 was 72.44 ft. BLS.





The graph above shows data collected by the continuous monitoring site located along the southbound lanes of I35 at the Salado rest stop during calendar year 2009. Collection of measurements began on May 6, 2008 at 15:00 and has continued every hour since then. The readings show an overall increase in 2009. The water level readings have ranged from 130.34 ft. BLS on September 3, 2009 to 118.04 ft. BLS on December 3, 2009 representing a 12.3 foot increase in water level during this period. The average reading during this time was 125.12 ft. BLS.



Continuous Monitor Well # 5804628 (Salado Cemetery)

The graph above shows the data collected by the continuous monitor site located at the Salado Cemetery grounds during calendar year 2009. Collection of measurements began on December 9, 2008 at 1:00 and has continued every hour since then. The readings show an overall increase in 2009. Water level readings ranged from 92.08 ft. BLS on September 3, 2009 to 14.38 ft. BLS on December 3, 2009 representing a 77.7 foot increase in water level during this period. The average reading during this time was 68.62 ft. BLS.

# F. ADDRESSING CONSERVATION RECHARGE ENHANCEMENT, RAINWATER HARVESTING, PRECIPITATION ENHANCEMENT, OR BRUSH CONTROL, WHERE APPROPRIATE AND COST-EFFECTIVE

# **Objective F1: Promote Conservation.**

## **Objective Satisfied**

The District's Management Plan requires promotion of conservation by one outreach method/activity. During FY09, the District satisfied this requirement by conducting an essay and poster contest on water conservation. This contest was conducted during the Fall of 2008 and was open to all 5<sup>th</sup> grade students in Bell County. The theme of the contest was *Don't be a Water Hog—Conserve Water*. Winners received savings bonds in the amount of \$100 (3<sup>rd</sup> place) \$250 (2<sup>nd</sup> place) and \$500 (1<sup>st</sup> place). A total of 131 entries were received. A copy of the flyer announcing this contest is located in Appendix G.

# **Essay and Poster Contest Winners**



# Essay Winners:

- 1<sup>st</sup> Sean Galli
- 2<sup>nd</sup> Hannah Thompson
- 3<sup>rd</sup> Claire Riggs

#### Poster Winners:

- 1<sup>st</sup> Tie Kathryn Dean 1<sup>st</sup> Tie Brittney Jenkins 2<sup>nd</sup> Dalton Laney 3<sup>rd</sup> Austin Overby
- <u>Objective F2: Promote Rainwater Harvesting.</u> Objective Satisfied

The District's Management Plan requires promotion of rainwater harvesting by posting information on the District website. The District satisfied this requirement by including a segment on rainwater harvesting on its website under the Education menu tab along with a link to the Texas AgriLife Extension website and their Rainwater Harvesting Manual. Also included are links to Rainwater Harvesting Contacts and Suppliers and to the Texas AgriLife Extension manual on Rainwater Harvesting Landscape Methods. A copy of the posted information is included under Appendix H.
#### <u>Objective F3: Provide Information on Recharge Enhancement and Brush Control.</u> Objective Satisfied

The District's Management Plan requires promotion of conservation by providing information relating to recharge enhancement and brush control on the District website. The District satisfied this requirement by including a segment on recharge enhancement and brush control on its website under the Education menu tab. For additional information on recharge enhancement and brush control, links to the Texas State Soil and Water Conservation website, the Leon River Restoration Project website, and the Texas Cooperative Extension website are provided. Also included is a link to the Brush Management Fact Sheet produced by Environmental Defense. A copy of the posted information is included under Appendix I.

### G. ADDRESSING IN A QUANTITATIVE MANNER THE DESIRED FUTURE CONDITIONS OF THE GROUNDWATER RESOURCES

Clearwater has been working toward this management goal since November 2005 when the first meeting of Groundwater Management Area 8 (GMA8) was held. GMA8 is responsible for determining desired future conditions (DFC) for the nine major and minor aquifers within its 45 county boundary. These aquifers are as follows:

Edwards BFZ	Brazos River Alluvium	Ellenburger-San Saba
Trinity	Blossom	Hickory
Woodbine	Nacatoch	Marble Falls

DFCs for all of these aquifers were set by GMA8 during FY08. Two DFCs (Blossom and Nacatoch) were revised during FY09. The TWDB prepares the resulting managed available groundwater (MAG) figures based on the DFC statements and then forwards these figures to the Regional Water Planning Groups. The MAG for the Edwards BFZ was finalized in September 2008. During FY09, the MAGs for seven aquifers, including the Trinity, were finalized. This leaves one MAG (Nacatoch) remaining to be finalized. The MAG figures for the Edwards BFZ and Trinity aquifers are being used by the District and will be included in the next revision of the District management plan.

During FY09, Clearwater continued acting as the fiscal agent/administrator for GMA8 coordinating with nine other groundwater conservation districts (GCD) to define the DFCs of the aquifers. Clearwater serves as the point of contact in coordinating with AECOM, Inc. and other outside agencies, maintains the GMA8 website, and coordinates the committee meetings. Clearwater's GMA8 representative frequently chairs the committee meetings and keeps the committee focused on set deadlines.

In FY09, three new GCDs in GMA8 were created by the state legislature. One GCD was dissolved and merged with an existing GCD, and another was renamed and restructured. This brings the number of GCDs in GMA8 to 12, covering 24 counties. No meeting with the newly created GCDs occurred during FY09. GMA8 held one meeting during FY09 on March 16, 2009.



# 4. MISCELLANEOUS ACTIVITIES

In addition to the Management Plan requirements, Clearwater is involved in several miscellaneous activities as follows:

- A. Trinity Aquifer Study in Southern Bell County
- B. Strategic Plan
- C. Drought Management Plan
- D. Salado Creek Stream Flow Gauging Program
- E. Subdivision Groundwater Availability Report Review
- F. Non-Exempt Well Meter Program
- G. Water Quality Protection Grant Program
- H. Water Quality Testing by Certified Lab
- I. Abandoned Wells
- J. Bell County Water Symposium
- K. Newsletter
- L. Major Rivers Water Education Program
- M. Book Cover Distribution
- N. Literature Packet Distribution
- O. Water Conservation Kits
- P. Presentations and Outreach
- Q. Public Advisory Committee
- R. Internet Site
- S. Resource Library

These activities are discussed in more detail below.

#### A. TRINITY AQUIFER STUDY IN SOUTHERN BELL COUNTY

In 2003, the District contracted with TCB, Inc. now AECOM, Inc. to conduct a study of the Trinity aquifer in southern Bell County due to the increase in residential development and the use of individual wells for water service. The study was to determine the hydrogeologic properties of the aquifer in this area and the volume of water in storage. The study evolved from its original scope to include calculation of the volume of groundwater stored in the three aquifer subdivisions (upper, middle, and lower) within the study area as well as outside the study area to include the entire county.

To enhance the Trinity Study and clarify some of the discrepancies identified in the study, it was recommended that geophysical logs of wells be conducted in southwestern Bell County to help determine where the Trinity layers are located and the thickness of the layers. The Clearwater Board authorized up to four geophysical logs. The logs will be completed as opportunity allows when new wells are drilled to the lower Trinity. One log was completed in FY07 (Miller), one in FY08 (Texas Veterans Land Board) and one in FY09 (Conway). Staff conducted brief pumping tests on the Conway well and the park well in River Ridge Ranch during FY09 to provide supplemental data for the study as well. A draft report has been presented to staff; the final report will be delivered in early 2010.

### **B.** STRATEGIC PLAN

The District developed a Strategic Plan during FY08, to prioritize the District's activities and objectives. This Plan is reviewed annually. An update on the status of the Strategic Plan is provided in Appendix N.

## C. DROUGHT MANAGEMENT PLANS

A draft Drought Management Plan (DMP) for the Edwards BFZ aquifer was adopted during FY09. This Plan was refined and formally adopted along with the DMP for the Trinity aquifer in December 2009. Compliance with both Plans is currently voluntary.

The trigger for initiating the drought stages in the Trinity DMP is based on the precipitation deficit index (PDI) for Bell County. Initially, the Palmer Drought Severity Index (PDSI) was under consideration, but as these figures were reviewed on a monthly basis, it was determined that the drought conditions within the regional areas depicted by the PDSI did not accurately reflect local drought conditions. Therefore, a more localized method of determining drought was desired. The PDI is monitored daily on a running-year basis over a defined area consisting generally of the area of Bell County with a buffer zone of approximately 10 miles around the County-line as truncated by the down-dip extent of the Trinity aquifer and based on NEX-RAD rainfall data provided by the National Oceanic and Atmospheric Administration. The PDI for this area is developed every day and compared to the average annual rainfall.

There are two triggers for initiating drought stages in the Edwards BFZ DMP. The first uses the same PDI as the Trinity except that the area of data collection is limited to the Edwards BFZ aquifer and contributing areas in Bell and portions of Williamson Counties. The second trigger is spring discharge which is monitored daily with the daily maximum discharge values averaged over a period of five consecutive days on a running five day basis. This data is provided by the Salado Creek stream flow gauges.

The spring discharge and PDI data collection is being automated during FY2010 and will be posted regularly on the District website for easy access by the public.

# D. SALADO CREEK STREAM FLOW GAUGING PROGRAM

The District began collecting data from the Salado Creek stream flow gauges during FY08. During FY09, the program was revised to allow more flexibility in designating periods for which the data is needed. Spring discharge may now be easily computed for any specified time period, to include the 5-day and 7-day averages stated in the Edwards BFZ DMP. Also, as previously noted, the collection of this data is being automated and will be posted on the District website during FY2010.

# E. SUBDIVISION GROUNDWATER AVAILABILITY REPORT REVIEW

The District continues to coordinate with the county commissioners and staff to ensure new subdivisions have an adequate source of water supply. The District's goal is to inform developers and potential purchasers of the groundwater resources in Bell County. No new subdivisions requiring a groundwater availability report were presented to the District during FY09.

## F. NON-EXEMPT WELL METER PROGRAM

As part of the FY09 budget, the Board approved \$1,000 toward purchasing meters for those nonexempt wells that were "grandfathered" and do not have a meter. Many of these well owners are estimating production, whereas a meter would ensure accurate reporting. There was only one participant in this program during FY09—Salado United Methodist Church.

## G. WATER QUALITY PROTECTION GRANT PROGRAM

The District's Water Quality Protection Grant Program provides financial assistance to local governmental entities and other non-profit entities that provide public drinking water. The funds are to be used to implement measures or recommendations that protect water quality. The District did not receive any grant applications during FY09.

# H. WATER QUALITY TESTING BY CERTIFIED LAB

The budget for FY09 included funds for water quality testing at a certified lab. The purpose of the testing is to enhance testing from the Texas Water Development Board (TWDB) that collects water samples for testing approximately every five years. TWDB collected samples from six wells during FY07—five Trinity wells and one Edwards well. Potential sites were identified and approved by the Board. These included two additional Edwards wells, six additional Trinity wells, and one sample from Salado Creek. The Board directed staff to test these sites every other year. The sites have been split into two groups with one group tested during FY09. This testing round included one sample from four wells as follows: one Edwards well, one Upper Trinity well, and two Middle Trinity wells. A surface water sample from Salado Creek was not available at the designated site due to low creek flow. The samples were processed by the Lower Colorado River Authority Environmental Laboratory Services (LCRA ELA). In addition, one sample, the Upper Trinity well, was tested for perchlorate. The testing results and locations are included in Appendix K.

# I. ABANDONED WELLS

The District continues to coordinate with the Texas Department of Licensing and Regulation (TDLR) to identify and investigate reports of abandoned wells. After initial investigation, staff

refers abandoned wells to TDLR for further investigation, determination of corrective action, and enforcement. The District did not refer any abandoned wells to TDLR during FY09.

The District continues to work with the Bell County Public Health District for assistance in locating abandoned wells when septic systems are inspected. The District promotes the plugging of abandoned wells by distributing educational information at various conferences and events and hosting well plugging demonstrations with the Texas AgriLife Extension. According to records from the Texas Department of Licensing and Regulation, during FY09 a total of 36 wells were plugged in Bell County—17 water wells and 19 monitor well. During the latter part of 2009, four additional wells were plugged—2 water wells and 2 monitor wells.

## J. BELL COUNTY WATER SYMPOSIUM

During FY09, Clearwater sponsored its eighth annual water symposium on November 6, 2008 at the Central Texas Council of Governments Building. The District partnered with the Texas AgriLife Extension and was able to provide Continuing Education Units for Private and Commercial Pesticide Applicators. Other partners included Bell County, AECOM, Inc., and Lloyd Gosselink Attorneys at Law.

Ken Kramer, Director of the Lone Star Chapter of the Sierra Club, was the keynote speaker talking about the connection between water and energy. Other topics included green buildings, water transfers, brush control for water conservation, watersheds and impairments, storm water management plans, and water issues coming up in the state legislature.



Bell County Annual Water Symposium, November 6, 2008

The District set up a display and distributed water conservation kits as well as other information on water conservation, water quality protection and information on the aquifers. Approximately 80 people attended the symposium. Refer to Appendix J for an agenda of the meeting. Appendix B contains the Activity Report that lists the items distributed during this event.

# K. NEWSLETTER



The District published its sixth annual newsletter—*The Clearwater Source*—during the latter part of FY09. The newsletter was mailed in September to all registered well owners. Newsletter articles included updates on the 2009 legislative session, including the moving of the District's election date to November; the GMA 8 joint planning process; water conservation; water quality protection; District activities; well registration and production; data on rainfall, lake levels, and aquifer levels; and the president's message on Clearwater's 10 year anniversary.

#### L. MAJOR RIVERS WATER EDUCATION PROGRAM

Each year the District sponsors the Major Rivers Water Education Program. This program is geared toward 4<sup>th</sup> and 5<sup>th</sup> grade students. During the spring of 2009, orders were taken for 923 students and 17 teachers in the Killeen, Temple, and Belton school districts. The Major Rivers Program material was delivered to the schools in September 2009. A list of participating schools is provided in Appendix B, Activity Reports.

#### M. BOOK COVER DISTRIBUTION

The District again participated in purchasing book covers during FY09 for all middle and high school students in Bell County with distribution to occur during the 2009/2010 school year. The book covers provide information on the importance of water and water conservation, and a brief overview of the District, including its goals and objectives. A total of 31,000 book covers were distributed to the students at the start of the school year during August and September 2009. The book covers distributed are shown in Appendix K.

#### N. LITERATURE PACKET DISTRIBUTION

The District compiles literature packets containing a variety of information on water conservation, the water cycle, and water quality. The packets are distributed to Bell County schools—one per campus—for each fall semester. Packets were distributed during the month of September and included 106 packets. A list of schools and the items distributed are found in Appendix B, Activity Reports.

#### O. WATER CONSERVATION KITS

To promote public awareness and encourage water conservation, the District distributes water conservation kits at special events. The water conservation kits include the following items:

faucet aerator; one touch on/off tap saver; 7 spray water saving hose nozzle; toilet leak detector dye tablets; shower flow meter bag; and lawn and garden rain gauge. These items were available for distribution at the following events: Annual Bell County Water Symposium (11-06-08); and Annual Crops Clinic (1-27-09). Refer to Appendix B for the Activity Report that lists the items distributed at these events.

#### P. PRESENTATIONS AND OUTREACH

Clearwater continues to promote public awareness of the District, water resources in Bell County and water conservation. Board members and staff have spoken to several groups and schools throughout the year and have attended various events and provided information for distribution regarding the District, groundwater resources, water cycle, water quality protection, and water conservation as identified below. (See Appendix B for the Activity Report that lists the material distributed.)

Presentations	Date	# Distributed
High School—Accelerated Academy—Temple ISD	10-03-08	245
Texas Ag Industries Assoc.—Stagecoach Inn, Salado	10-07-08	
4 <sup>th</sup> & 5 <sup>th</sup> Grade—Nolanville Elementary—Killeen ISD	10-17-08	1,600
4 <sup>th</sup> & 5 <sup>th</sup> Grade—Holland Elementary—Holland ISD	10-27-08	680
5 <sup>th</sup> Grade—Nolanville Elementary—Killeen ISD	11-17-08	1,080
5 <sup>th</sup> Grade—St. Mary's Catholic School—Temple	12-01-08	300
5 <sup>th</sup> Grade—Leon Heights Elementary—Belton ISD	02-13-09	384
Fort Hood Earth Day School Event—Fort Hood Stadium	04-24-09	1,000
3 <sup>rd</sup> & 5 <sup>th</sup> Grade—Peebles Elementary—Killeen ISD	05-01-09	600
5 <sup>th</sup> Grade—Bellaire Elementary—Killeen ISD	06-03-09	480
Morgan's Point Resort (MPR) Summer Reading Program		
—MPR Library	06-20-09	120
Kiwanis Club Lunch Speaker—Temple College, Temple	06-30-09	
Edwards Aquifer Recharge Zone Mtg—Salado Intermediate		
School, Salado	09-22-09	110

#### TOTAL

Other Events	Date	# Distributed
Relay for Life Walk—Belton	10-11-08	75
Bell County Water Symposium—CTCOG Bldg., Belton	11-06-08	927
Annual Crops Clinic—Bell Co. Expo, Belton	01-27-09	846
Lawn & Garden Expo—Bell Co. Expo, Belton	02-21-09	200
Bell Co. Historical Society—Primitive Baptist Church, Killeen	03-23-09	140
Essay/Poster Contest Participants	04-14-09	720
Salado Earth Day Public Event—Pace Park, Salado	04-18-09	217
National Trails Day—Lions Park, Temple	06-06-09	210
Railroad & Heritage Museum Family Fun Day—Temple	06-20-09	330
TX AgriLife Extension Jr. Master Gardener Training	07-27-09	30

6.599

## Q. PUBLIC ADVISORY COMMITTEE

At the end of FY08, there were two vacancies in the Public Advisory Committee (PAC). These vacancies were filled early in FY09; the resulting PAC members are as follows

Tom Madden	-	Precinct 1
Henry Bunke	-	Precinct 2
Marvin Green, PAC Chair	-	Precinct 3
Bradley Ware	-	Precinct 4
David Cole	-	At-Large

The PAC meets on an as-needed basis and met only once during FY09 (February 26, 2009) for a brief orientation. Throughout FY09, PAC members have regularly attended the Clearwater Board meetings, providing representation at all of the 12 Board meetings. The PAC has provided valuable comments to the Board members at these meetings. The Board continues to value the input from the PAC and will assign tasks to them as needed.

## **R. INTERNET SITE**

The District's web site (<u>www.clearwaterdistrict.org</u>) continues to grow since it was first developed in the spring of 2001. The web site contains general information about the District and Board of Directors; calendar of events; press releases; meeting agendas; District Management Plan; District Rules; links to water-related sites; District forms; an overview of the District including a summary of activities; aquifer data; and educational information including data on water use and water conservation tips.

Records indicate that the top pages accessed during 2009 were the Overview of Bell County Aquifers; GMA8 Adopts Trinity DFC; Legislative Update  $-80^{\text{th}}$  Legislature Summary Press Release; September 2008 Newsletter; and District Rules. Information will be added to the web site during the next year as needed.

#### S. RESOURCE LIBRARY

The District maintains a resource library to help promote public education and conservation of our water resources. The resource library consists of videotapes and literature focusing on the water cycle, groundwater, water conservation, and other water-related issues. This information is designed for age groups from pre-K to college level. The information in the Clearwater library is available for use by the public. A listing of the library material is shown in Appendix L.

# 5. SUMMARY

During FY09, the District continued to acquire data for use in managing Bell County's groundwater resources. Data was collected regularly from the stream flow gauge sites in Salado Creek which are used to estimate spring discharge from the Edwards BFZ aquifer. A third continuous monitoring well was equipped in the Edwards aquifer and three monitoring wells were drilled in the Trinity aquifer, to be equipped in FY10. Geophysical logs of the three Trinity wells were also conducted.

A geophysical log of the lower Trinity (Hosston) was conducted during FY09, the third of four logs authorized by the District to supplement data for the "Trinity Study for Western Bell County." As noted in previous years, this study has been completed (final report forthcoming); however, some discrepancies were identified. The data from the logs will be used to address these discrepancies. This data will also assist in determining whether it is appropriate to manage the Trinity aquifer by layer. The final report will be delivered early in 2010.

Data acquisition also included ongoing projects like the aquifer monitoring program and monthly production reports from non-exempt wells, as well as estimates of exempt well use which are updated biannually. Samples from wells were also collected for testing at a certified lab to provide an example of water quality in a given area.

During FY09, the District adopted a drought management plan for the Edwards BFZ aquifer and implemented drought stages on a voluntary basis. This plan was later revised and re-adopted along with the drought management plan for the Trinity aquifer during the latter part of 2009. Discussion to protect the Edwards BFZ recharge zone continued during FY09 and a stakeholders meeting was held in Salado to get input from Edwards users. The District budgeted funds to conduct various studies during FY10 to gather more information on the Edwards BFZ aquifer.

Clearwater continued its participation in GMA 8. During FY09, seven managed available groundwater figures were finalized leaving only one remaining to be finalized. In addition, two desired future conditions statements were revised.

Public education and service continued to be a major focus of the District during FY09. District staff visited several schools giving presentations focusing on Bell County's aquifers, water conservation, and non-point source pollution. In addition, the annual water symposium continued to be major outreach opportunity.

During FY10, the District will continue to acquire data on the aquifers and will automate the collection of data from the Salado Creek Stream Flow Gauging Program to monitor Salado Springs. The data will be available to the public on the District website. Rainfall data to support the District's drought management plans will also be automated and available on the website. The District will move forward with the four Edwards BFZ aquifer studies to collect more data to be considered as discussions regarding recharge zone protection continue. Data from the Trinity aquifer monitoring wells will be collected and reviewed to determine whether management of the Trinity aquifer by layer is the appropriate course to follow. The District Management Plan will be revised to incorporate the desired future condition statements and managed available groundwater figures established through the groundwater management area joint planning process.

# Appendix A



# Appendix B

**Activity Report** 

# CLEARWATER UNDERGROUND WATER CONSERVATION DISTRICT 07/21/2010 Activity Report

CUWCD Representative: President Grace, Vice President Biskup, PAC Member Bunke and

staff.

Activity: \_\_\_Summer 2010 Well Plugging Demonstration

Date(s)/Location: 21July2010 / 4950 Atkins Rd., Salado, TX 76571

Information Distributed and Quantity: General Welcome and Clearwater Well Plugging

Presentation. 5 of the following items were distributed: CUWCD Water Conservation Short

Sheet, CUWCD "Who We Are", Auto Not Pollute brochure, Water a vital resource brochure,

Top 10 bookmark, Texas Lawn Watering Guide, Water Conservation Brochure, Groundwater Basics brochure.

Notes:\_\_\_\_

CUWCD Representative: Staff & Directors	
Activity: Bell County Water Symposium	
Date(s):11-06-08	
Location:CTCOG Building	
Information Distributed and Quantity:See attached	
Notes: <u>Approximately 80 people attended the event.</u>	

Item	<u>Quantity</u>
CUWCD	
CUWCD Brochure folder	27
CUWCD Fall 2008 Newsletter	27 60
Use Water Wisely Wheels	35
Cups	55 65
Cups Rulers	03 47
Dencils	43
Ink Pens	80
Frishees	42
Spray Bottles_Indoor Use	42
Spray Bottles—Autoor Use	45
Balloons	13
Calendars	36
Calendars	50
Texas Alliance of Groundwater Districts	
TAGD Brochure	7
Groundwater Foundation	
Groundwater Basics brochure	10
Bookmark—The Water Cycle	27
Bookmark—Top 10 Ways to Protect and Conserve Groundwater	32
Texas Groundwater Protection Committee	
Landowners Guide to Plugging Abandoned Wells	10
TWDB	
Texas Lawn Watering Guide	9
49 Water Conservation Tips	5
Dillos Demonstrate Water Conservation	6
Water Smart org	
Water Smart "bill stuffers" indoors	4
Water Smart "bill stuffers" outdoors	4
	·
Miscellaneous	
Auto Not Pollute Slide Card	8
Water Conservation Items:	
Faucet Aerator	50
One Touch On/Off Tap Saver	50
Shower Flow Meter Bag	19
Toilet Leak Detector Dye Tablets	47
7 Spray Water Saving Hose Nozzle	50
Lawn & Garden Rain Gauge	49
TOTAL	927

#### **Activity Report**

**Activity Report** 

CUWCD Representative:\_\_\_\_\_Staff\_\_\_\_\_\_

Activity: Classroom Presentations

Date(s)/Location: 10-3-08 Temple High School Accelerated Academy, Temple ISD

Information Distributed and Quantity: <u>35 the following: TWDB Shower Flow</u>

bags; TWDB Lawn Watering Guide; CUWCD activity cards; CUWCD Info Card; The

Groundwater Foundation Bookmarks—The Water Cycle; Groundwater Foundation brochure—

Groundwater Basics; Water Education Foundation—You Auto Not Pollute Slide Card.

Notes: Presentation included powerpoint and groundwater model.

**Activity Report** 

CUWCD Representative:\_\_\_\_\_Staff

Activity: Classroom Presentations

Date(s)/Location:\_12-1-08 St. Mary's Catholic School, Temple; 5th grade students

Information Distributed and Quantity: 25 of the following: TWDB Shower Flow bags;

2009 CUWCD Calendar; CUWCD frisbees; CUWCD pencils; CUWCD rulers; CUWCD

water wheel; The Groundwater Foundation Bookmarks-The Water Cycle; Water Conservation

Sticker Sheets; TWDB Dillos Demonstrate Water Conservation; TWDB Being Water Smart

Indoors; TWDB Being Water Wise Outdoors; TWDB 49 Water Saving Tips.

Notes:\_\_Presentation included powerpoint and groundwater model.

CUWCD Representative:Staff	
Activity: Splash Activity Book Distribution	
Date(s): September 25, 2009	
Location:Bell County Schools—3 <sup>rd</sup> Grade	
Information Distributed and Quantity:	
Notes: <u>Staff contacted Bell County schools and took orders in the spring</u> .	

#### **SPLASH SCHOOLS 2009**

Barrett Pollard, Principal Leon Heights Elementary School 1501 North Main Street Belton, TX 76513 160 copies

Sherri Ruiz Miller Heights Elementary School 1110 Fairway Drive Belton, TX 76513 265 copies

Donna Ward **Tarver Elementary School** 7949 Stonehollow Road Temple, TX 76502 **500 copies** 

Holli Boyd Scott Elementary School 2301 West Ave. P Temple, TX 76504 200 copies

Patricia Groholski, Principal Western Hills Elementary School 600 Arapaho Temple, TX 76504 200 copies

Terry Arant Salado Intermediate School 550 Thomas Arnold Road Salado, TX 76571 95 copies Gail Avioes Instructional Specialist **Clifton Park Elementary** 2200 Trimmier Killeen, TX 76541 **305 copies** K=70 $1^{st} = 70$  $2^{nd} = 80$  $3^{rd} = 80$ And 5 extra

Shelre Holden **Duncan Elementary School** 52425 Muskogee Road Fort Hood, TX 76544 **450 copies** 

Lorrie Davenport-Polson **Oveta Culp Hobby Elementary** 53210 Lost Moccasin Fort Hood, TX 76544 **130 copies** 

Janet Kulm **Oveta Culp Hobby Elementary** 53210 Lost Moccasin Fort Hood, TX 76544 **100 copies** 

Andrea Tomgenovich Instructional Specialist **Timber Ridge Elementary** 5402 White Rock Drive Killeen, TX 76542 **150 copies** 

Denise Brennan **Timber Ridge Elementary School** 5402 White Rock Drive Killeen, TX 76542 **200 copies**  Jordan Peterson Reeces Creek Elementary School 400 West Stan Schlueter Loop Killeen, TX 76542 25 copies

Jennifer Boren-Coley Reeces Creek Elementary School 400 West Stan Schlueter Loop Killeen, TX 76542 30 copies

Mollie McBroom Campus Instructional Specialist **Reeces Creek Elementary** 400 W. Stan Schlueter Loop Killeen, TX 76542 **750 copies** 

CUWCD Representative:Staff	
Activity: Salado Earth Day Public Event	
Date(s)/Location:04-18-09	
Information Distributed and Quantity: See attached.	
Notes:	

# **Quantity**

Item
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CUWCD	
Brochure folder	8
Fall 2008 Newsletter	5
Use Water Wisely Wheels	5
Cups	40
Rulers	9
Pencils	15
Ink Pens	36
Frisbees	17
Calendars	1
Shower Bags	9
Well Registration Form	0
Groundwater Foundation	
Bookmark—The Water Cycle	9
Bookmark—Top 10 Ways to Protect and Conserve Groundwater	46
TWDB	
Being Water Wise Outdoors Brochure	0
Being Water Smart Indoors Brochure	1
Miscellaneous	
Water Conservation Sticker Sheets	12
Auto Not Pollute Slide Cards	3
Plugging Abandoned Water Wells Brochure	3
TOTAL	219

CUWCD Representative: <u>Staff</u>	
Activity:Relay for Life Walk	
Date(s)/Location: 10-11-08	
Information Distributed and Quantity:75 Cl	JWCD frisbees
Notes:	

**Activity Report** 

CUWCD Representative:\_\_\_\_\_

Activity: Railroad & Heritage Museum Family Fun Day

Date(s)/Location: 06-20-09 Railroad & Heritage Museum, Temple

Information Distributed and Quantity: <u>30 of the following: AWWA Splash Books;</u>

CUWCD Water Conservation Letter; CUWCD info cards. 50 of the following: CUWCD Water

Wheels, Frisbees, Rulers, and Pencils. 40 Shower Flow Bags.

Notes: \_\_Staff did not attend this event but provided items for distribution.

**Activity Report** 

CUWCD Representative:\_\_\_\_\_Staff

Activity: Classroom Presentations

Date(s)/Location: <u>5-1-09 Peebles Elementary School, Killeen ISD; 3 & 5 grade students</u>

Information Distributed and Quantity: <u>100 of the following: TWDB Shower Flow bags;</u>

CUWCD activity cards; CUWCD pencils; CUWCD rulers; CUWCD water wheel; CUWCD

Frisbee.

Notes: \_\_\_\_6 presentations included powerpoint and groundwater model to appox. 98 students

**Activity Report** 

CUWCD Representative:\_\_\_\_\_Staff

Activity: Classroom Presentations

Date(s)/Location:\_10-17-08 Nolanville Elementary School, Killeen ISD; 4 & 5 grade students

Information Distributed and Quantity: 200 of the following: TWDB Shower Flow bags;

CUWCD activity cards; CUWCD Info Card; CUWCD pencils; CUWCD rulers; CUWCD

water wheel; The Groundwater Foundation Bookmarks-The Water Cycle; Water Conservation

Sticker Sheets.

Notes: Presentation included powerpoint and groundwater model.

**Activity Report** 

CUWCD Representative:\_\_\_\_\_Staff

Activity: Classroom Presentations

Date(s)/Location:\_11-17-08 Nolanville Elementary School, Killeen ISD; 5 grade students

Information Distributed and Quantity: <u>135 of the following: TWDB Shower Flow bags;</u>

CUWCD activity cards; CUWCD Info Card; CUWCD pencils; CUWCD rulers; CUWCD

water wheel; The Groundwater Foundation Bookmarks—The Water Cycle; Water Conservation

Sticker Sheets.

Notes: Presentation included groundwater model.

CUWCD Representative:
Activity:National Trails Day
Date(s)/Location:06-06-09 Lions Park, Temple
<b>Information Distributed and Quantity:</b> 30 of the following: CUWCD Water
Wheels, Frisbees, Rulers, Pencils, Water Conservation Letter, Info Cards, and Shower Flow
Bags.
Notes:Staff did not attend this event but provided items for distribution.

CUWCD Representative:Staff
Activity: Major Rivers Water Education Program Distribution
Date(s): September 25, 2009
Location:Bell County Schools
Information Distributed and Quantity:
Notes: Staff contacted Bell County schools and took orders in the spring. Each teacher kit
includes 30 student workbooks. Teacher guides include 30 student workbooks and an updated teacher handout.

# Major Rivers Orders for Fall 2009 Bell County

School	Grade	Students	Teachers Kits	# of Teacher Packages	# Electronic Packets	# of Additional Packets	# Bilingual
Killeen ISD Timber Ridge Elementary	4	175	7	7	0	0	0
Audie Murphy Middle School	6	210	2	0	2	7	1
Saegert Elementary	4	130	1	0	0	4	0
Nolanville Elementary	5	42	1	1	1	0	0
Temple ISD Scott Elementary	4	130	2	2	0	1	0
Belton ISD Pirtle Elementary	4 & 5	236	4	4	4	6	0
TOTAL		923	17	14	7	18	1

Each teacher packet serves 30 students. Each additional student packet serves 30 students.

CUWCD Representative: <u>Staff</u>
Activity: September 2009 water conservation literature packet distribution
Date(s): 9-25-2009
Location:106 school campuses in Bell County (9 private schools and 97 public schools)
Information Distributed and Quantity: 106 literature packetsSee attached
Notes:

# CLEARWATER UNDERGROUND WATER CONSERVATION DISTRICT 2009 LITERATURE PACKET

#### **Clearwater Underground Water Conservation District**

Cover Letter & Packet List Resource Library Groundwater Production Water Use Information Bell County Aquifers Water Consumption Worksheet

#### **Texas Water Development Board**

Map—Groundwater Conservation Districts Map—Major Aquifers of Texas Map—Minor Aquifers of Texas Map—Major River Basins in Texas Map—Regional Water Planning Groups Map—Groundwater Management Areas of Texas Rainwater Harvesting FAQ Water IQ/TWDB Kids Raising Your Water IQ: A Water Conservation Curriculum

#### **The Groundwater Foundation**

Being Water-Wise Outdoors Being Water Smart Indoors The Water Cycle Bookmark Top 10 Ways to Protect and Conserve Groundwater Bookmark Easy Ways to Conserve Water Be Water Wise All Week

#### The Water Sourcebook Activities

Oh Well...How We Get Water From The Ground? Percolation What Is In Source Water?

#### **United States Geological Survey**

What Is A Watershed? Where Is Earth's Water Located? Water Quality Ground-Water Flow Ground-Water Quiz

#### **Miscellaneous**

Map—Watersheds of Central Texas Understanding Our Water Supply The Groundwater Gazette-Issue 1: Groundwater Basics What Is Nonpoint Source (NPS) Pollution? What You Can Do To Prevent NPS Pollution

#### **Activities**

Fun Fact Maze Hidden Words Aquifers Hidden Words Reservoir

#### PUBLIC SCHOOL DISTRIBUTION LIST....July 2, 2009

Mr. Kevin Sprinkles, Superintendent (3)Academy I.S.D.704 E. Main StreetLittle River, TX 76554-9801

Dr. Vivian Baker, Superintendent (12) Belton I.S.D. 400 N. Wall Street Belton, TX 76513

Dr. Robert Muller, Superintendent (51) Killeen I.S.D. P.O. Box 967 Killeen, TX 76540

Mr. Billy Wiggins, Superintendent (4) Salado, I.S.D. P.O. Box 98 Salado, TX 76571-0098

Mr. Kerry Hansen, Superintendent (4) Troy I.S.D. P.O. Box 409 Troy, TX 76579-0409 Mr. Michael Mayfield, Superintendent (3) Bartlett I.S.D. P.O. Box 170 Bartlett, TX 76511-0170

Ms. Cindy Gunn, Superintendent (3) Holland I.S.D. P.O. Box 217 Holland, TX 76534-0217

Mr. Bob Callaghan, Superintendent (3) Rogers Independent School District 1 Eagle Drive Rogers, TX 76569-9998

Dr. Robin Battershell, Superintendent (14) Temple I.S.D. P.O. Box 788 Temple, TX 76503-0788
### PRIVATE SCHOOL DISTRIBUTION...July 2, 2009

Sheila Sharp, Director Temple Christian Center P.O. Box 3220 Temple, TX 76505 254-778-4555 (K-12, currently have approx. 13 students)

Janet Blacklock, Principal(Elementary) Central Texas Christian Academy 4141 W. FM 93 Temple, TX 76504

Jheri Lynn Smith, Director Temple Montessori School 1302 S. 27<sup>th</sup> Street Temple, TX 76504

Rose Thompson, Principal Richard Milburn Academy 1001 E. Veterans Memorial Blvd. Killeen, TX 76541

Mr. James Melone, Principal St. Mary's School 1019 South 7<sup>th</sup> Street Temple, TX 76504

Mr. Chris Mosmeyer, Principal Holy Trinity Catholic School 418 North 11<sup>th</sup> Street Temple, TX 76501

Colvin Davis American Preparatory Institute P. O. Box 1800 Killeen, TX 76540 (254)526-1315

Becky Kirkland, Principal St. Joseph Catholic School 2901 E. Rancier Avenue Killeen, TX 76543

Christ Church School (K-3) 317 N. 1<sup>st</sup> St. Temple, TX 76501 Attn: Margaret Allwine

**Activity Report** 

CUWCD Representative:\_\_\_\_\_Staff

Activity: Classroom Presentations

Date(s)/Location:\_2-13-09 Leon Heights Elementary School, Belton ISD; 5 grade students

Information Distributed and Quantity: <u>48 of the following: TWDB Shower Flow bags;</u>

CUWCD activity cards; CUWCD Info Card; CUWCD pencils; CUWCD rulers; CUWCD

water wheel; The Groundwater Foundation Bookmarks—The Water Cycle; Water Smart Tip

brochure.

Notes: Presentation included powerpoint and groundwater model.

CUWCD Representative:Coordinated with "Keep Temple Beautiful"
Activity: Lawn and Garden Expo
Date(s)/Location:2-21-09 Bell County Expo Center
Information Distributed and Quantity: 40 of the following: CUWCD cups;
Notes:

## **Activity Report**

Date(s)/Location:\_06-30-09, Temple College Pavilion, Temple

Information Distributed and Quantity: Presentation only—no items distributed

Notes:\_\_\_\_\_

**Activity Report** 

CUWCD Representative:\_\_\_\_\_Staff

Activity: Classroom Presentations

Date(s)/Location:\_10-27-08 Holland Elementary School, Holland ISD; 4 & 5 grade students

Information Distributed and Quantity: <u>85 of the following: TWDB Shower Flow bags;</u>

CUWCD activity cards; CUWCD Info Card; CUWCD pencils; CUWCD rulers; CUWCD

water wheel; The Groundwater Foundation Bookmarks-The Water Cycle; Water Conservation

Sticker Sheets.

Notes: Presentation included powerpoint and groundwater model.

CUWCD Representative: Horace Grace
Activity: Bell County Historical Society
Date(s)/Location:3-23-09 Primitive Baptist Church, Killeen, TX
Information Distributed and Quantity:35 of the following: CUWCD Newsletter;
CUWCD info card; CUWCD calendar; ink pens.
Notes:

CUWCD Representative:Staff
Activity:Fort Hood Earth Day School Presentations
Date(s)/Location:04-24-09 Fort Hood Stadium
Information Distributed and Quantity:200 of the following: TWDB Shower Flow
bags; CUWCD Use Water Wisely Wheels, CUWCD activity cards; CUWCD pencils; CUWCD
rulers.
Notes:Approximately 8 presentations were given and included an overview of aquifers,
groundwater protection and water conservation.

CUWCD Representative:
Activity:Essay/poster contest participants
Date(s)/Location:04-14-09
Information Distributed and Quantity: <u>120 of the following: TWDB Shower Flow</u>
bags; CUWCD Use Water Wisely Wheels; CUWCD activity cards; CUWCD pencils; CUWCD
rulers; CUWCD frisbees
Notos

CUWCD Representative:Staff and Board
Activity:Edwards Aquifer Recharge Zone Meeting
Date(s)/Location:9-22-09 Salado Intermediate School
Information Distributed and Quantity: See attached.
Notes:

## **Quantity**

CUWCD	
Who We Are Brochure Insert	13
CUWCD Fall 2009 Newsletter	12
Use Water Wisely Wheels	14
Ink Pens	31
Groundwater Foundation	
Groundwater Basics brochure	13
Bookmark—The Water Cycle	11
Bookmark—Top 10 Ways to Protect and Conserve Groundwater	9
Miscellaneous	
Auto Not Pollute Slide Card	7
TOTAL	110

## <u>Item</u>

CUWCD Representative: Staff & Directors
Activity: Annual Crops Clinic
Date(s): 01-27-09
Location:Bell County Expo Center
Information Distributed and Quantity:See attached
Notes:Approximately 450 people attended the event

# <u>Quantity</u>

CUWCD	
CUWCD Brochure folder	4
CUWCD Fall 2008 Newsletter	4
Use Water Wisely Wheels	24
Cups	96
Rulers	87
Pencils	68
Ink Pens	100
Frisbees	51
Spray Bottles—Indoor Use	40
Spray Bottles—Outdoor Use	40
Calendars	19
Groundwater Foundation	
Groundwater Basics brochure	2
Bookmark—The Water Cycle	13
Bookmark—Top 10 Ways to Protect and Conserve Groundwater	13
Texas Groundwater Protection Committee Plugging Abandoned Water Wells Brochure	6
Tugging Abandoned water wens brochure	0
TWDB	
Texas Lawn Watering Guide	5
Texas AgriLife Extension	
Drinking Water Problems: MTBE Handout	5
Miscellaneous	
Auto Not Pollute Slide Card	2
Water Conservation Sticker Sheets	7
Water Conservation Items:	
Faucet Aerator	50
One Touch On/Off Tap Saver	50
Shower Flow Meter Bag	10
Toilet Leak Detector Dye Tablets	50
7 Spray Water Saving Hose Nozzle	50
Lawn & Garden Rain Gauge	50
TOTAL	846

## <u>Item</u>

**Activity Report** 

CUWCD Representative:\_\_\_\_\_Staff

Activity: Classroom Presentations

Date(s)/Location:\_6-3-09 Bellaire Elementary School, Killeen ISD; 5th grade students

Information Distributed and Quantity: <u>80 of the following: TWDB Shower Flow bags;</u>

CUWCD activity cards; CUWCD pencils; CUWCD rulers; CUWCD water wheel; CUWCD

Frisbee.

Notes: \_\_\_\_4 presentations included powerpoint and groundwater model to appox. 74 students

**Activity Report** 

CUWCD Representative:\_\_\_\_Staff Activity: Morgans Point Summer Reading Program Date(s)/Location:\_\_\_\_\_06-20-09 Morgans Point Library Information Distributed and Quantity: <u>30 of the following: CUWCD pencils,</u> water stickers, Splash books and CUWCD frisbees Notes:\_\_1 presentation was given and included an overview of aquifers, groundwater protection and water conservation.

# Appendix C

### NOTICE OF OPEN MEETING

BRAZOS G REGIONAL WATER PLANNING GROUP 10:00 a.m., Wednesday, October 29, 2008 Brazos River Authority Central Office 4600 Cobbs Drive, Waco, Texas 76710

### <u>AGENDA</u>

- 1. CALL MEETING TO ORDER
- 2. INVOCATION
- 3. NOTICE OF MEETING
- 4. ATTENDANCE AND ANNOUNCEMENTS
- 5. PUBLIC INPUT Public questions and comments on agenda items or water planning issues (limited to 5 minutes each; public must fill out a 'Request to Speak' form prior to the discussion of the agenda item)
- 6. PROGRAM
  - 6.1. Report from Texas Parks and Wildlife Department staff and possible discussion regarding department activities
  - 6.2. Report from Texas Water Development Board (TWDB) staff and possible discussion on water planning issue
  - 6.3. Discussion and possible action on a 'consistency waiver' request by Parker County Special Utility District to implement a water management strategy to treat raw water purchased from the Brazos River Authority
  - 6.4. Report and possible discussion on revisions to 2006 Brazos G Regional Water Plan
  - 6.5. Report and possible discussion on Phase I Scope of Work Study tasks
  - 6.6. Discussion and possible action on the Executive Committee recommendations for the voting member vacancies representing Public Interest and Water Utilities interest categories
  - 6.7. Report and possible discussion on funding for Phase II of the Third Round of Regional Water Planning
  - 6.8. Discussion and possible action on Phase II of the Third Round of Regional Water Planning
    - 6.8.1.Consider authorizing Brazos River Authority to enter into a regional water planning contract with Texas Water Development Board on behalf of the Brazos G Regional Water Planning Group to receive funding for Phase II of the 2011 Brazos G Regional Water Plan, and
    - 6.8.2.Consider authorizing Brazos River Authority to enter into a professional services agreement with HDR Engineering, Inc. on behalf of the Brazos G Regional Water Planning Group for development of Phase II of the 2011 Brazos G Regional Water Plan

- 6.9. Report and possible discussion on Joint Committee on State Water Funding
- 7. DISCUSSION AND POSSIBLE ACTION ON NEW BUSINESS TO BE CONSIDERED AT NEXT MEETING
- 8. CONFIRMATION OF NEXT MEETING DATE
- 9. ADJOURN

Agenda items may be considered, deliberated and/or acted upon in a different order than set forth above.

Meeting agendas and materials are available online at <u>www.brazosgwater.org</u> For additional information, please contact Trey Buzbee at 254-761-3168 or vía e-mail <u>info@brazosgwater.org</u> Brazos River Authority, Administrative Agent

## NOTICE OF OPEN MEETING

### BRAZOS G REGIONAL WATER PLANNING GROUP 10:00 a.m., Wednesday, December 3, 2008 Brazos River Authority Central Office 4600 Cobbs Drive, Waco, Texas 76710

### AGENDA

- 1. CALL MEETING TO ORDER
- 2. INVOCATION
- 3. NOTICE OF MEETING
- 4. ATTENDANCE AND ANNOUNCEMENTS
- 5. PUBLIC INPUT Public questions and comments on agenda items or water planning issues (limited to 5 minutes each; public must fill out a 'Request to Speak' form prior to the discussion of the agenda item)
- 6. PROGRAM
  - 6.1. Environmental Flows Briefing, Barney Austin, Texas Water Development Board
  - 6.2. Report from Texas Parks and Wildlife Department staff and possible discussion regarding department activities
  - 6.3. Report from Texas Water Development Board (TWDB) staff and possible discussion on water planning issues
  - 6.4. Report and possible discussion on Brazos G quarterly financial report
  - 6.5. Report and possible discussion on 2011 Brazos G Regional Water Plan Phase I Studies
    - 6.5.1. Study 1: Impacts of Drought on Water Supplies in Upper Brazos G Region
    - 6.5.2. Study 2: Re-evaluate Water Management Strategies in the Nolan County Area
    - 6.5.3. Study 3: Regionalization Strategies to Assist Small Water Systems in Meeting New SDWA Requirements
    - 6.5.4. Study 4: Refine Water Management Strategies for Johnson County
    - 6.5.5. Study 5: Refine Water Management Strategies for McLennan County
  - 6.6. Public Input on 2011 Brazos G Regional Water Plan Phase I Studies 1, 2, 3, 4 and 5
  - 6.7. Discussion and possible action on submission of 2011 Brazos G Regional Water Plan Phase I Studies 1, 2, 3, 4, and 5 to Texas Water Development Board for consideration
  - 6.8. Discussion and possible action on Water User Groups with population projection over 5% from previous planning cycle projections
  - 6.9. Discussion and possible action on TWDB steam electric water demand projections

- 6.10 Report and possible discussion on agreement with Texas Water Development Board for Phase II of the Third Round of Regional Water Planning
- 6.11 Presentation of outgoing voting member plaques
- 7. DISCUSSION AND POSSIBLE ACTION ON NEW BUSINESS TO BE CONSIDERED AT NEXT MEETING
- 8. CONFIRMATION OF NEXT MEETING DATE
- 9. ADJOURN

# Agenda items may be considered, deliberated and/or acted upon in a different order than set forth above.

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## NOTICE OF OPEN MEETING

### BRAZOS G REGIONAL WATER PLANNING GROUP 10:00 a.m., Wednesday, February 18, 2009 Brazos River Authority Central Office 4600 Cobbs Drive, Waco, Texas 76710

#### AGENDA

- 1. CALL MEETING TO ORDER
- 2. INVOCATION
- 3. NOTICE OF MEETING
- 4. ATTENDANCE AND ANNOUNCEMENTS
- 5. PUBLIC INPUT Public questions and comments on agenda items or water planning issues (limited to 5 minutes each; public must fill out a 'Request to Speak' form prior to the discussion of the agenda item)
- 6. PROGRAM
  - 6.1. Report from Texas Parks and Wildlife Department staff and possible discussion regarding department activities
  - 6.2. Report from Texas Water Development Board (TWDB) staff and possible discussion on water planning issues
  - 6.3. Discussion and possible action on recommendation of nominees for Chair, Vice-Chair, and two (2) At-Large Executive Committee positions
  - 6.4. Report and possible discussion on 2011 Brazos G Regional Water Plan Phase I Studies
  - 6.5. Discussion and possible action on proposed schedule for development of the 2011 Brazos G Regional Water Plan
  - 6.6. Discussion and possible action on revisions to Brazos G population projections
  - 6.7. Discussion and possible action on modifications to Brazos G WAM necessary for surface water supply analyses. Consider submitting a request to TWDB to:
    - 6.7.1. Approve use of modified WAM, and
    - 6.7.2. Utilize safe yields above Possum Kingdom and for Lake Palo Pinto
  - 6.8. Discussion and possible action on proposed methodology for determining available groundwater supplies for the 2011 Brazos G Regional Water Plan
  - 6.9. Discussion and possible action on TWDB steam electric water demand projections
  - 6.10. Discussion and possible action on regional water planning policies and legislative recommendations

- 6.11. Discussion and possible action on two (2) proposed minor amendments to 2006 Brazos G Regional Water Plan
  - 6.11.1. Include water treatment infrastructure for the City of Granbury
  - 6.11.2. Include specific reuse infrastructure projects for City of Waco and Waco Area Metropolitan Regional Sewage System (WMARSS) member cities
- 6.12. Presentation of outgoing voting member plaques
- 7. DISCUSSION AND POSSIBLE ACTION ON NEW BUSINESS TO BE CONSIDERED AT NEXT MEETING
- 8. CONFIRMATION OF NEXT MEETING DATE
- 9. ADJOURN

Agenda items may be considered, deliberated and/or acted upon in a different order than set forth above.

Meeting agendas and materials are available online at <u>www.brazosgwater.org</u> For additional information, please contact Trey Buzbee at 254-761-3168 or vía e-mail <u>info@brazosgwater.org</u> Brazos River Authority, Administrative Agent

## NOTICE OF OPEN MEETING

### BRAZOS G REGIONAL WATER PLANNING GROUP 10:00 a.m., Wednesday, April 15, 2009 Brazos River Authority Central Office 4600 Cobbs Drive, Waco, Texas 76710

### AGENDA

- 1. CALL MEETING TO ORDER
- 2. INVOCATION
- 3. NOTICE OF MEETING
- 4. ATTENDANCE AND ANNOUNCEMENTS
- 5. PUBLIC INPUT Public questions and comments on agenda items or water planning issues (limited to 5 minutes each; public must fill out a 'Request to Speak' form prior to the discussion of the agenda item)
- 6. PROGRAM
  - 6.1. Report from Texas Parks and Wildlife Department staff and possible discussion regarding department activities
  - 6.2. Report from Texas Water Development Board (TWDB) staff and possible discussion on water planning issues
  - 6.3. Report and possible discussion on Brazos G quarterly financial report
  - 6.4. Discussion and possible action on two (2) proposed minor amendments to 2006 Brazos G Regional Water Plan
    - 6.4.1. Include water treatment infrastructure for the City of Granbury
    - 6.4.2. Include specific reuse infrastructure projects for City of Waco and Waco Area Metropolitan Regional Sewage System (WMARSS) member cities
  - 6.5. Discussion and possible action on 2011 Brazos G Regional Water Plan Phase I Studies
    - 6.5.1. Address Phase I Report Comments from TWDB
    - 6.5.2. Consider submission of final Phase I Reports to the TWDB
  - 6.6. Discussion and possible action on final population projections approved by TWDB to prepare the 2011 Brazos G Regional Water Plan and associated water demand projections for municipal water user groups
  - 6.7. Discussion and possible action regarding steam-electric water demand projections to prepare the 2011 Brazos G Regional Water Plan
  - 6.8. Discussion and possible action on groundwater availability for Brazos G counties and aquifers for use in the 2011 Brazos G Regional Water Plan
    - 6.8.1. New modeling for the Carrizo-Wilcox and Trinity Aquifers

- 6.8.2. Coordination with Groundwater Management Areas in Brazos G Region
- 6.8.3. Groundwater availability estimates from other areas
- 6.9. Discussion and possible action on use of Alternative Safe Yield Estimates for specific Brazos G Region reservoirs
- 6.10. Discussion and possible action on Brazos G Regional Water Planning Group workgroup and committees membership
- 6.11. Discussion and possible action on solicitation of new Brazos G Regional Water Planning Group Municipal and Water Districts voting member positions
- 7. DISCUSSION AND POSSIBLE ACTION ON NEW BUSINESS TO BE CONSIDERED AT NEXT MEETING
- 8. CONFIRMATION OF NEXT MEETING DATE
  - 8.1. Wednesday, June 17, 2009
- 9. ADJOURN

Agenda items may be considered, deliberated and/or acted upon in a different order than set forth above.

Lunch will be provided for MEMBERS ONLY, if served

Meeting agendas and materials are available online at <u>www.brazosgwater.org</u> For additional information, please contact Trey Buzbee at 254-761-3168 or via e-mail <u>info@brazosgwater.org</u> Brazos River Authority, Administrative Agent

## NOTICE OF OPEN MEETING

#### BRAZOS G REGIONAL WATER PLANNING GROUP 10:00 a.m., Wednesday, June 17, 2009 Brazos River Authority Central Office 4600 Cobbs Drive, Waco, Texas 76710

#### **AGENDA**

- 1. CALL MEETING TO ORDER
- 2. INVOCATION
- 3. NOTICE OF MEETING
- 4. ATTENDANCE AND ANNOUNCEMENTS
- 5. PUBLIC INPUT Public questions and comments on agenda items or water planning issues (limited to 5 minutes each; public must fill out a 'Request to Speak' form prior to the discussion of the agenda item)
- 6. PROGRAM
  - 6.1. Report from Texas Parks and Wildlife Department staff and possible discussion regarding department activities
  - 6.2. Report from Texas Water Development Board (TWDB) staff and possible discussion on water planning issues
  - 6.3. Discussion and possible action on preferred steam-electric water demand projections that will be used to prepare the 2011 Brazos G Regional Water Plan
  - 6.4. Discussion and possible action on alternative safe yield assumptions for 2011 Brazos G Regional Water Plan
  - 6.5. Discussion and possible action on initial groundwater and surface water supplies based on well capacities, groundwater availability estimates, WAM analyses, and infrastructure constraints for use in the 2011 Brazos G Regional Water Plan
  - 6.6. Report and possible discussion on water supply needs (shortages) that will be used to complete the 2011 Brazos G Regional Water Plan
  - 6.7. Discussion and possible action on the process for identification, evaluation, and consideration of water management strategies that will be included in the 2011 Brazos G Regional Water Plan
  - 6.8. Discussion and possible action regarding Brazos G Regional Water Planning Group committees, establishment, and designation of members
- 7. DISCUSSION AND POSSIBLE ACTION ON NEW BUSINESS TO BE CONSIDERED AT NEXT MEETING
- 8. CONFIRMATION OF NEXT MEETING DATE
  - 8.1. Wednesday, August 19, 2009
- 9. ADJOURN

Agenda items may be considered, deliberated and/or acted upon in a different order than set forth above.

Lunch will be provided for MEMBERS ONLY, if served

Meeting agendas and materials are available online at <u>www.brazosgwater.org</u> <u>For additional information, please contact</u> **Trey Buzbee** at 254-761-3168 or vía e-mail <u>info@brazosgwater.org</u> Brazos River Authority, Administrative Agent

### NOTICE OF OPEN MEETING

### BRAZOS G REGIONAL WATER PLANNING GROUP 10:00 a.m., Wednesday, August 19, 2009 Brazos River Authority Central Office 4600 Cobbs Drive, Waco, Texas 76710

### AGENDA

- 1. CALL MEETING TO ORDER
- 2. INVOCATION
- 3. NOTICE OF MEETING
- 4. ATTENDANCE AND ANNOUNCEMENTS
- 5. PUBLIC INPUT Public questions and comments on agenda items or water planning issues (limited to 5 minutes each; public must fill out a 'Request to Speak' form prior to the discussion of the agenda item)

### 6. PROGRAM

- 6.1. Report from Texas Parks and Wildlife Department staff and possible discussion regarding department activities
- 6.2. Report from Texas Water Development Board (TWDB) staff and possible discussion on water planning issues
- 6.3. Discussion and possible action on the Brazos G Executive Committee recommendations for the voting member vacancies representing Municipalities and Water Districts interest categories
- 6.4. Presentation of outgoing voting member plaque(s)
- 6.5. Recognize Michael McClendon as Region O representative to Brazos G
- 6.6. Report and possible discussion on Brazos G quarterly financial report
- 6.7. Report and possible action on North Central Texas Municipal Water Authority's request for a water management strategy to evaluate alternate dam sites for the Miller's Creek Reservoir
- 6.8. Discussion and possible action on the request(s) to use alternative safe yield estimates
  - 6.8.1. City of Abilene's request to utilize a two-year safe yield estimate as the basis for determining the water supplies available from Fort Phantom Hill Reservoir
  - **6.8.2.** West Central Texas Municipal Water District's request to utilize a two-year safe yield estimate as the basis for determining the water supplies available from Hubbard Creek Reservoir
- 6.9. Discussion and possible action on updates to water demand/supply comparisons, with addition of information from Wholesale Water Providers
- 6.10. Discussion and possible action on new and/or updated water management strategy evaluations
- 6.11. Discussion and possible action regarding methodology for determining conservation savings as a water management strategy
- 6.12. Discussion and possible action on revisions to Managed Available Groundwater estimates in the Brazos G planning area

- 6.13. Report and possible discussion on coordination of water supplies between Brazos G and Region H planning areas
- 6.14. Discussion and possible action on information compiled by the TWDB from water loss audits performed by retail public utilities for incorporation into the 2011 Brazos G Regional Water Plan
- 7. DISCUSSION AND POSSIBLE ACTION ON NEW BUSINESS TO BE CONSIDERED AT NEXT MEETING
- 8. CONFIRMATION OF NEXT MEETING DATE
  - 8.1. Wednesday, September 16, 2009
- 9. ADJOURN

Agenda items may be considered, deliberated and/or acted upon in a different order than set forth above.

Lunch will be provided for MEMBERS ONLY, if served

Meeting agendas and materials are available online at <u>www.brazosgwater.org</u> For additional information, please contact Trey Buzbee at 254-761-3168 or vía e-mail <u>info@brazosgwater.org</u> Brazos River Authority, Administrative Agent

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# Appendix D

Results of Groundwater Samples Tested During FY2009 <sup>1</sup>															
Test Date	CUWCD #	Aquifer <sup>2</sup>	Depth (ft)	Coliform Bacteria <sup>3</sup>	Fecal Matter	Alkalinity (mg/L)	Conductivity (µs/cm)	Dissolved	Fluoride <sup>4</sup> (mg/L)	Hardness (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	рН	Phosphat e (mg/L)	Sulfate <sup>4</sup> (mg/L)
9/8/2009	E-02-016G	Alluvium	45	Present	Absent	340	445	276	N/A	400	4.30	0.003	7.2	0.08	9
9/23/2009	E-02-3141G	Alluvium	30	Present	Absent	420	724	477	0.30	200	7.30	0.008	7.1	0.3	17
9/23/2009	E-02-3141G	Alluvium	30	Absent	Absent	420	685	469	0.30	160	8.60	0.004	7.2	0.51	17
8/18/2009	E-09-036G	Alluvium	39	Present	Absent	280	2210	1589	N/A	1480	8.40	0.000	7.2	0.03	80
9/8/2009	E-02-144G	Austin Chalk	30	Present	Absent	320	300	253	0.51	320	1.10	0.003	7.2	0.15	11
9/23/2009	E-02-144G	Austin Chalk	30	Present	Absent	240	410	284	0.70	320	1.20	0.006	7.3	0.45	10
4/14/2009	N2-08-004P	Edwards BFZ	430	Present	Present	320	921	648	2.30	160	1.50	0.011	7.7	0.08	80
9/23/2009	E-02-1364G	Lower Trinity	800	Absent	Absent	320	1718	1262	2.30	400	1.50	0.015	7.7	0.39	80
1/30/2009	E-09-007G	Lower Trinity	94	N/A	N/A	100	19080	11970	1.40	960	0.00	0.002	8.3	0.00	80
1/30/2009	N1-08-001P	Lower Trinity	500	Absent	Absent	280	1943	1483	1.90	460	1.10	0.004	7.50	0.09	80
8/10/2009	N2-09-008P	Lower Trinity	629	N/A	N/A	280	5040	2950	1.60	320	0.00	0.080	8.1	0.29	80
4/14/2009	E-05-092P (outside faucet)	Middle Trinity	880	Present	Present	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4/20/2009	E-05-092P (#1 Well)	Middle Trinity	880	Present	Absent	N/A	N/A	N/A	N/A	N/A	N/A	N/a	N/A	N/A	N/A
4/20/2009	E-05-092P (#1Well w/star)	Middle Trinity	880	Present	Absent	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4/20/2009	E-05-092P (#3Inside)	Middle Trinity	880	Present	Absent	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4/14/2009	E-05-092P (inside kitchen)	Middle Trinity	880	N/A	N/A	360	1307	795	2.20	0	0.80	0.061	8.1	0.07	80
3/24/2009	E-05-092P(Master Bath)	Middle Trinity	880	Absent	Absent	340	1286	822	2.20	20	0.00	0.159	N/A	0.08	80
4/20/2009	E-05-092P(Outside Faucet)	Middle Trinity	880	Present	Absent	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5/26/2009	E-05-092P(Well Faucet #1)	Middle Trinity	880	Absent	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5/26/2009	E-05-092P(Well Faucet #2)	Middle Trinity	880	Absent	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3/24/2009	E-05-092P(Well Faucet)	Middle Trinity	880	Present	Absent	340	1157	709	2.10	80	1.00	0.108	N/A	0.02	80
5/5/2009	N2-09-001P	Middle Trinity	1000	Present	Present	480	3670	2870	2.20	440	0.00	0.000	7.8	0.03	80
8/10/2009	N2-09-007P	Middle Trinity	469	N/A	N/A	160	2830	1667	2.30	100	1.00	0.012	8.7	0.14	80
8/25/2009	E-02-537G	Upper Trinity	735	Present	Absent	340	1865	1425	N/A	280	1.10	0.017	8.0	0.22	80
8/25/2009	E-02-832G	Upper Trinity	192	Present	Present	220	413	235	N/A	280	0.00	0.006	7.3	0.09	47
6/4/2009	E-09-023G (#1 Inside)	Upper Trinity		Present	Absent	340	2760	1945	2.30	260	1.10	0.006	7.8	0.10	80
6/4/2009	E-09-023G (#7Outside)	Upper Trinity		Present	Absent	340	2930	1987	2.30	220	0.50	0.004	7.9	0.22	80
6/5/2009	E-09-023G(#5 Outside)	Upper Trinity		Present	Absent	360	2700	1868	2.30	320	1.00	0.000	7.7	0.17	80
8/10/2009	N2-09-006P	Upper Trinity	450	N/A	N/A	300	2490	1441	2.20	740	0.00	0.000	7.6	0.05	80
8/25/2009	E-09-038G			Absent	Absent	400	1585	1202	N/A	100	0.40	0.001	7.9	0.14	80
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Results Summary									
	#of samples tested	(+) Coliform	%	(+) Fecal Matter	%				
FY2009totals	30	18	60%	4	13.3%				
FY2008 totals	27	13	48%	0	0%				
FY2007 totals	38	24	63%	8	21%				
FY2006 totals	15	3	20%	0	0%				
FY2005 totals	14	5	36%	0	0%				

Notes: 1. Samples were collected by the well owner and tested by the Clearwater staff within 24 hours of collection. The well owner was given instructions on collecting the sample and was asked to draw the sample as close to the wellhead as possible. Laboratory results were not conducted by a certified lab, therefore, the data is provided for informational purposes only.

The equire designation was determined by AECOM, Inc.
The presence/absence test only indicates if total coliform is present. No distinction is made on the origin of the bacteria.
The imit of the Fluoride test is 2.3 mg/L and the limit of the Sulfate test is 80 mg/L.
NT means not tested because the test was not requested or the test could not be performed because the equipment was under repair.



# Appendix E

## Palmer Drought Severity Index January – December 2009

















**DROUGHT PREPAREDNESS COUNCIL** 

RICK PERRY Governor 5805 N. Lamar Blvd. P.O. Box 4087 Austin, Texas 78773-0220 Phone: (512) 424-2138 Fax: (512) 424-2444 January 8, 2009 JACK COLLEY Council Chairman

TO: The Honorable Rick Perry, Governor, State of Texas

The Honorable David Dewhurst, Leiutenant Governor, State of Texas

Ms. Esperanza Andrade, Secretary of State, State of Texas

The Honorable Mario Gallegos, Jr., President Pro-Tempore of the Senate, State of Texas

The Honorable Tom Craddick, Speaker of the House, State of Texas

The Honorable Steve Ogden, Chairman, Senate Finance Committee, State of Texas The Honorable Kip Averitt, Chairman, Senate Natural Resources Committee, State of Texas

The Honorable John Carona, Chairman, Senate Committee on Transportation & Homeland Security, State of Texas

The Honorable Warren Chisum, Chairman, House Appropriations Committee, State of Texas

The Honorable Mike Hamilton, Vice-Chairman, House Natural Resources Committee, State of Texas

The Honorable Sid Miller, Chairman, House Agriculture & Livestock Committee, State of Texas

The Honorable Aaron Peña, Chairman, House Criminal Jurisprudence Committee, State of Texas

Mr. Jay Kimbrough, Chief of Staff, Office of the Governor

Mr. Steven McGraw, Director, Texas Governor's Office of Homeland Security

**FROM:** Chief Jack Colley, Chairman, Drought Preparedness Council

**SUBJECT:** Statewide Drought Situation Report

## 1. NEXT COUNCIL MEETING

February 12, 2009, 2:00 p.m., Governor's Conference Room of the Governor's Division of Emergency Management, State Operations Center, Texas Department of Public Safety Headquarters, 5805 N. Lamar Blvd., Austin, Texas.

At this time, the Council will continue to meet on a monthly basis.

Jack Colley, Chairman Governor's Division of Emergency Mgmt

Lance Williams, Member

Texas Department of Agriculture Carla Baze, Member Texas Department of Transportation

Chris Loft, Member Texas Commission on Environmental Quality

Michael Dunivan, Member

Texas Forest Service

John Sutton, Member Texas Water Development Board

Dr. Travis Miller, Member Texas Cooperative Extension

David A. Van Dresar, Member Texas Alliance of Groundwater Districts

Thomas Walker, Member Office of the Governor Economic Development & Tourism

Gus Garcia, Member Office of Rural Community Affairs Richard Egg, Member State Soil & Water Conservation Board

Cindy Loeffler, Member Texas Parks & Wildlife Department

Paul Tabor, Member Texas Department of State Health Services

Edward T. Morris, Member Texas Department of Housing and Community Affairs

Dr. John W. Nielsen-Gammon, Member Office of the State Climatologist

### 2. GENERAL CONDITIONS

According to radar estimates from the Advanced Hydrologic Predictions Service, precipitation in Texas during December was below normal for 99% of the State. Despite several frontal boundaries passing through the State, the western two-thirds of Texas received less than an inch of precipitation in December. The Edwards Plateau, Trans-Pecos, and Low Rolling Plains regions of Texas were the driest regions in the entire United States based on the percent of normal precipitation for December.

December was characterized by a number of fronts passing through the eastern half of Texas, but most brought only very cold air and precipitation was confined to East Texas and the Upper Texas coast. Some areas in the eastern third of Texas received over an inch of precipitation from the 9<sup>th</sup> through the 10<sup>th</sup>. A trailing upper level disturbance brought 2" inches of snow to College Station and 5" of snow to areas in Beaumont/Port Arthur on December 10<sup>th</sup> through the 11<sup>th</sup>. A strong cold front pushing from east to west across the State on the 27<sup>th</sup> through the 28<sup>th</sup> brought much needed precipitation to South Central Texas and produced a weak tornado in Franklin County.

South Central Texas, the area of greatest concern for long-term drought, received less than half of its climatologically expected precipitation for the fourth consecutive month. Most areas in South Central Texas climate division 7 received between 0.25" to 0.50" of precipitation. San Antonio received 0.25" of precipitation and Austin/Mabry received 0.40" of precipitation.

As a result of this dryness, the United States Drought Monitor named an "Exceptional Drought" classification (D4) for 14 counties in the Austin/San Antonio region. The percent of Texas with this status rose from 1.25% at the beginning of December to 4.15% by the end of the month. The percentage of Texas with at least "Moderate Drought" conditions (D1) is 24.5%, up from 11.6% from the beginning of 2008.

The USGS stream flow maps indicated several stations along the Brazos, Colorado, and Red Rivers had discharges below the 10<sup>th</sup> percentile. This represents conditions relative to those that have historically occurred at this time of year. On January 4, the number of stations in the driest two of seven classes was at 23, the largest number of stations since November 2006.

The El Niño-Southern Oscillation (ENSO) cycle is forecast to be in a negative phase through the early part of 2009. According to the Climate Prediction Center (CPC), current atmospheric and oceanic conditions reflect La Niña. The current one-month forecast from the CPC calls for an equal chance of below normal, near normal, and above normal precipitation across the State. The three-month outlook calls for a 33-40% chance of below normal precipitation for most of the southwestern half of the State, the exception being a greater than 40% chance of below normal precipitation in the Trans Pecos region. The rest of the State has an equal chance of below normal, near normal, and above normal precipitation. The area of "Exceptional Drought" in Central Texas is expected to persist and perhaps expand during the next few months. The small area of "Moderate Drought" north of Dallas/Fort Worth along the Red River is expected to improve.

## 3. OVERALL STATEWIDE DROUGHT CONDITIONS

According to the Palmer Drought Severity Index (PDSI), the North Central region is under "Mild Drought" conditions. The Edwards Plateau region is under "Moderate Drought" conditions, and the South Central region is under "Severe Drought" conditions. The remainder of the State is under either near "Normal" or "Wet Spell" conditions. The Lower Valley region is under "Extremely Wet" conditions. The PDSI varies from extremely wet, very wet, moderately wet, slightly wet, incipient wet spell, near normal, incipient dry spell, mild drought, moderate drought, severe drought, and extreme drought in order of increasing severity.

The Crop Moisture Index (CMI) indicates all regions are near normal.

An update of the Six-Month Standardized Precipitation Index (SPI) is not available.

The Keetch-Byram Drought Index (KBDI) indicates the fire risk is above average in the Low Rolling Plains region, high in the North central, Trans-Pecos, Upper Coast, and Lower Valley regions, and very high in the Edwards Plateau, South Central, and Southern regions. The KBDI is a drought index specifically used to describe potential or expected fire behavior. The index is classified as Low, Moderate, High or Extreme fire danger, in order of increasing severity.

## 4. WATER UTILITY STATUS

January 2009 began with 100 public water systems requiring customers to conserve water by following water use restrictions. Of those systems, 70 asked customers to follow a mandatory watering schedule and 30 asked for voluntary reductions in usage.

The Central region of the State is in a "Severe Drought". Springs flows and well levels continued to fall resulting in more restrictive watering plans. Significant rain is needed to enable public water systems to review water restrictions in place.

## 5. WATER RIGHTS – STATEWIDE

New temporary water use permit applications are reviewed on a site-specific basis and are issued if there is sufficient surplus water at the requested source. Applications for new water use permits and amendments to existing permits remained normal during the month. The water rights owners in the Brazos River Basin, whose permits contain the Hale Clause restrictions, observed less severe stream flow conditions during the winter months. The availability of unappropriated water for new water use permits continued to decrease in all river basins in the State and the search for long-term, dependable alternate sources of water remained a high priority issue.

## 6. WATER RIGHTS - LOWER RIO GRANDE / RIO GRANDE WATERMASTER (RGWM)

**Current Overall Conditions:** As of December 27, 2008, the U.S. combined ownership at Amistad/Falcon stood at 96.56% of conservation capacity or 3,520,914 acre-feet of new temporary conservation capacity. This is up from 103.04% or 3,494,971 acre-feet from a year ago at this time. Overall, the system is holding 97.86% or 6,228,685 acre-feet of conservation capacity with Amistad at 97.09% or 3,371,743 acre-feet and Falcon at 98.79% or 2,856,942 acre-feet. Mexico has 99.61% or 2,707,771 acre-feet of the water it could store at Amistad/Falcon.

**Allocations:** As of the printing of the December ownership report, the U.S. allocated in excess of 785,038 acre-feet for irrigation and mining. The U.S. continued to have an amount in excess of 717,274 acre-feet for future allocations in 2008.

**Storage & Loss Amistad vs. Falcon:** The U.S. is currently storing approximately 1.85 million acre-feet or 95.4% at Amistad, and approximately 1.66 million acre-feet or 97.9% at Falcon.

Evaporation and seepage losses at Amistad YTD were 46,554 acre-feet. During the same period, the U.S. lost 49,789 acre-feet at Falcon. The ratio of loss between Amistad and Falcon continued to be 1:2, consistent with Amistad being twice as efficient in overall storage and loss.

**Releases to Meet Demands:** Mexico released 901,538 acre-feet from Amistad and 861,801 acre-feet from Falcon for Mexico needs. The U.S. released 1,693,138 acre-feet from Amistad and 1,116,340 acre-feet from Falcon for U.S. needs. Combined with gains between Amistad and Falcon, U.S. inflows to Falcon totaled 1,988,702 acre-feet. So far, the U.S. met 65% of overall needs in the middle and Lower Rio Grande directly from middle Rio Grande and Amistad inflows this year.

**Upper Rio Grande (New Mexico):** Currently, Elephant Butte in New Mexico is storing 623,435 acre-feet or 30.81% and Caballo Dam, downstream of Elephant Butte, is storing 21,889 acre-feet or 9.64%. This water storage, in part, was used to meet water needs in the El Paso area.

**Outlook:** All active accounts began 2008 with 100% usable balances. The reservoirs increased in elevation due to the rainfall here and in the upper Rio Grande Regions. To alleviate losses in Falcon, the U.S. continued to monitor ownership and elevation levels in both Falcon and Amistad for more efficient U.S. transfers of water from Amistad to Falcon. It appeared that 2009 will start with all active accounts at full capacity. Both U.S. reservoirs are considered full as are the majority of the Mexican reservoirs in the Rio Grande Basin. "No Charge Pumping" was declared effective October 26, 2008 from Amistad down to the Gulf for all diversion requests.

# 7. SOUTH TEXAS WATERMASTER – GUADALUPE / LAVACA / SAN ANTONIO / NUECES REGION

The South Central region of the State continued to be impacted by worsening drought conditions in December. This region of Texas was listed under "Exceptional" drought. This indicator is the worst stage of drought as defined by the U.S. Drought Monitor. Little rain fell on this region of the State in December. Major rivers and tributaries continued to show steady declines in flows.
#### Area Counties: Bandera, Blanco, Comal, Kendall and Kerr Counties

**Rainfall and Area Conditions:** This area received varying amounts of precipitation, ranging from 0.20 to 0.50 inches during December. With that rainfall, the Texas Crop Moisture Index in this area of the Hill Country was classified as "Mildly" to "Abnormally Dry". Most surface water diversions in this area are for municipal and industrial uses, with a few surface water permit holders irrigating hay and sod fields. The U.S. Drought Monitor indicated this area is currently in "Extreme" to "Exceptional" drought conditions.

**Stream Flow Conditions**: None of the major streams or their tributaries flowed at normal capacities. Most of the major streams showed a slight increase in flow during December, which may be contributed to the trees along the water courses being in their dormant stages. Most of the smaller secondary tributaries lost surface flow.

Site	Ending Flows CFS	Historical Mean CFS
Guadalupe River near Kerrville	50	122
Guadalupe River near Comfort	56	339
Medina River at Bandera	25	269

**Drought Restrictions:** All temporary surface water permits in the Guadalupe River Basin above Canyon Lake and the San Antonio River Basin above Lake Medina were suspended. Because of the low stream flows, some State permit holders reached their flow restrictions and were curtailed from pumping. River flows are monitored on a daily basis.

**Area Counties:** Bee, Goliad, Victoria, Calhoun, Jackson, Refugio, Aransas, San Patricio, Nueces, Kleberg, Jim Wells, Duval, Live Oak, Kenedy, Willacy, Brooks, and Jim Hogg.

**Rainfall and Area Conditions:** This area received little rainfall during December. Some localized rainfall events occurred throughout the month, ranging from a trace to one inch. The rainfall did not provide much soil moisture or runoff into local area streams. The U.S. Drought Monitor indicated the area is experiencing "Abnormally Dry" to "Moderate Drought" to "Severe Drought" conditions. The Corpus Christi Reservoir System received little inflows during this time. Therefore, the reservoir level continued to drop. Most of the surface water diversions continued to be for municipal and industrial uses, little irrigation was noted.

#### Stream Flow Conditions:

Site (Years of Record)	Beginning Flows CFS	Ending Flows CFS	Last Month CFS	Historical Mean CFS
Guadalupe River near Victoria				
(74)	400	479	380	1,820
San Antonio River near Goliad				
(74)	240	253	214	508
San Antonio River at				
McFaddin below Goliad (2)	270	267	269	427
Guadalupe River near Tivoli				
(2)	400	659	822	2,720
Mission River near Refugio				
(69)	2	4.5	4.8	59
Nueces River at Calallen Dam				
(8)	15	10	4.7	154
Aransas River near Skidmore				
(44)	3.3	3.2	3.5	6

**Corpus Christi Reservoir System:** The Corpus Christi Reservoir System did not receive much inflow during December and the level of the reservoir system continued to drop slightly. The Corpus Christi Reservoir System is currently at 77.1% of capacity or 734,167 acre-feet, compared to 98.3% of capacity or 930,117 acre-feet, during this same time last year. Choke Canyon is currently at 81.2% of capacity or 564,761 acre-feet, compared to 97.4 capacity or 677,227 acre-feet, during this same time last year. Lake Corpus Christi is currently at 65.9% of capacity or 169,406 acre-feet, compared to 98.3% of capacity or 252,890 acre-feet, last year. Corpus Christi continues to divert much of their monthly water supply needs from Lake Texana.

**Drought Restrictions:** No additional drought restrictions of water rights in this area.

**Area Counties:** Atascosa, Karnes, Gonzales, Wilson, McMullen, Dewitt, Guadalupe, Lavaca, Fayette, Colorado, Wharton, and Jackson.

**Rainfall and Area Conditions:** This area received 0.00 to 0.5 inches of rainfall during December. The northeastern region received 1 to 3 inches. Soil moisture conditions were very poor. Hay season ended and oat and rye crops suffered without supplemental irrigation. There was very little irrigation activity. Lake Texana is at 78% of capacity, which is 39.7 feet above mean sea level.

According to the U.S. Drought Monitoring System, this area experienced "Abnormally Dry" "Exceptional" drought conditions.

#### Stream Flow conditions:

Site	Ending Flows CFS	Last Month CFS	Historical Mean CFS
San Antonio River near Falls City	177	Unk	302
Cibolo Creek near Falls City	32	33	32
Guadalupe River near Gonzalez	564	515	1,140
Lavaca River at Edna	65	13	59
Navidad River near Halletsville	3.7	1.6	30
Atascosa River near Whitsett	6.6	1.9	12
Frio River near Tilden	13	13	32
Nueces River near Tilden	0.12	0.16	2.6

**Drought Restrictions:** There were no additional restrictions on diversions.

Area Counties: Edwards, Real, Kinney, Uvalde, Zavala, Dimmit, La Salle and Webb.

**Rainfall and Area Conditions:** The Southwest Texas area received no relief from the drought conditions during December. There were small amounts of precipitation reported for the beginning and middle of the month, with a range of 0.10 to 0.45 inches. Most diversions of surface water were for irrigational use and small amounts for municipal and industrial uses. Crops irrigated in the area were: wheat, sesame seeds, winter rye, hay grazers, and pecans. The U.S. Drought Report indicated this area is experiencing "Abnormally Dry" to "Extreme" drought conditions.

#### Stream Flow Conditions:

Site	Ending Flows CFS	Last Month CFS	Historical Mean CFS
Nueces River at Laguna	57	50	127
Nueces River at Brackettville	0.14	0.14	5.4
Nueces River below Uvalde	17	17	111
Frio River at Concan	38	28	99
Sabinal River at Sabinal	1.6	0.80	20
Leona River near Uvalde	26	24	51

Stream flows of intermittent and tributary streams in the area were flowing well below average for this time of year.

**Drought Restrictions:** Permits with stream flow restrictions are being regulated. The Zavala/Dimmit Water District had a rotational diversion schedule on the Nueces River to ensure adequate water for domestic and livestock use.

**Area Counties:** Bastrop, Bexar, Blanco, Caldwell, Comal, Fayette, Frio, Guadalupe, Hays, and Medina.

**Rainfall and Area Conditions:** Well below average monthly rainfall fell across the San Antonio Regional Area during December. Month to date rainfall at the San Antonio International Airport was 0.27 inches. The average for December is 1.96 inches. Total annual rainfall to date is 13.73 inches; normal year to date is 32.79 inches, a departure from

normal of 19.06 inches. On December 24, 2008, the U. S. Drought Monitor indicated the San Antonio Regional Area was experiencing "Severe" to "Exceptional" Drought Conditions. This impacted crops, pastures and grasslands, stream flows, and reservoir capacities. Ground moisture was relatively poor due to the lack of rain and cloud cover. Winter oats, mustard greens, turnips, beets, carrots, Swiss chard, collard greens, and spinach were planted.

**Stream Flow Conditions:** The Guadalupe and Blanco Rivers showed the impact of the worsening drought. Small creeks dried and most major streams are beginning to quickly pool or dry up entirely. Municipal use decreased with the shorter days and residential lawns required less irrigation. Industrial use remained constant.

All major tributaries in the San Antonio Regional Area were well below their historical monthly averages for December

The Canyon Lake Reservoir was at 898.01 feet elevation, impounding 296,014 acre-feet, and was at 79.13% of capacity. On December 29, 2008, the Edwards Aquifer level at the J17 well in Bexar County was 669.9 feet. The historical average for December is 669.1 feet, which is 1.0 feet below the monthly historical average.

Site	Ending Flows CFS	Historical Mean CFS
Blanco River at Wimberley	15	127
San Marcos River at Luling	107	404
Guadalupe River at Spring Branch	63	314
San Marcos Springs	99	174
Comal Springs	292	302

**Drought Restrictions:** Most Temporary Permits were not allowed to divert surface water. Surface water permits are closely monitored in regards to "real time" stream flows as to whether or not they are allowed to divert.

Area Counties: Sterling, Tom Green, Irion, Concho, Coke, Glasscock, Runnels, Reagan, and Schleicher.

Rainfall was scarce in the Concho River Valley during December, falling well below the monthly average for the third consecutive month. According to information provided by the USDA, the State Drought Monitor Index of the Concho Valley was at "Abnormally Dry" drought conditions.

**Rainfall and Area Conditions:** Rainfall in San Angelo during December was 0.04 inches. The average rainfall amount in the area was 1.20 inches. Areas surrounding San Angelo received slightly higher rainfall amounts. The total yearly amount of rainfall is 20.60 inches. In 2007, there were 32.05 inches of rain. Average annual rainfall, based on 100 years of record, is 19 inches. Area reservoirs were showing slight decreases in the amount of storage from the previous month. Irrigation demand by appropriated surface water rights in the Concho Valley was at a reduced volume, due to timely rains. The Texas Crop Moisture Index indicated soil moisture content was "Abnormally Dry". Cotton was stripped and picked and winter wheat was planted.

# Stream Flow Conditions:

Area lakes indicate Lake Nasworthy is at 81% of capacity or 8,444 acre-feet, O. C. Fisher was at 5% of capacity or 6,173 acre-feet, and Twin Buttes Lake was at 32% of capacity or 59,173 acre-feet.

Site	Ending Flows CFS	Historical Mean CFS	Years of Record
USGS Gaging System at Spring			
Creek/Twin Buttes	9.7	15	4
USGS Gaging System at Concho			
River/San Angelo	13	32	77
USGS Gaging System at South			
Concho/Christoval	8.1	23	73

**Drought Restrictions:** There were no additional restrictions on diversions in the Concho Valley.

8. UPPER COLORADO\_(Concho River watershed not included)

The upper Colorado River area received less than normal precipitation during December. The National Weather Service in San Angelo reported monthly precipitation of 0.04 inches, which was 0.90 inches below normal. The annual total to date was 19 inches, which was 1.91 inches below normal. According to the U.S. Drought Monitor, the drought conditions in the area ranged from "Abnormal" to "Moderate", and the upper reaches of the Llano River watershed are in an area of "Severe" drought. Most tributaries in the upper Colorado watershed had diminished flows. However, there were isolated areas that flowed at or above the USGS long-term median. The pool levels of EV Spence and OH Ivie Reservoir decreased during November, reaching levels of 10% and 55% of capacity, respectively.

# 9. TEXAS PANHANDLE AND SOUTHERN HIGH PLAINS

**Amarillo Area:** The Amarillo Region reported the following summary for the Northern panhandle area:

Lake Meredith was at 53.20 feet and decreasing. Lake Greenbelt ended December at 55.19 feet. The Canadian River upstream of the lake flowed at 25 CFS. Lake MacKenzie was at 70.76 feet. The National Weather Service in Amarillo reported a total rainfall in December of 0.05 inches, which was 0.56 inches above the yearly average.

**Lubbock Area:** Lubbock received only 0.01 inches for the month. The average rainfall for December was 0.67 inches. Similar amounts were recorded throughout the Region 2 area. Total precipitation for 2008 stood at 28.00 inches; which was 9.31 inches above normal for this point in the year. The long term drought situation was not changed. All of the communities previously noted as being on mandatory water restrictions remained on those restrictions. No new communities were added to the water restrictions list during November, and none were removed.

Lubbock and Amherst remained on mandatory drought restriction status. Ralls, Crosbyton, Spur, Post, White River WCS, and Valley WSC in the South Plains area remained on voluntary drought restriction status.

**White River Lake:** The lake's pool elevation was at 2351.74 acre-feet, or 18.5 feet below full. This is an decrease of 0.35 feet from the level at the end of November 2008. White River WSD has groundwater wells on standby to supply water to its customers if the lake level drops below usable levels.

**Lake Alan Henry:** The lake is full. It is not used for public drinking water supplies at present, but will be utilized for this purpose in the near future.

#### **10. AGRICULTURAL CONCERNS**

No information available at this time.

#### 11. DROUGHT IMPACTS TO WILDLIFE

No information available at this time.

#### 12. WILDFIRE CONCERNS

The Keetch-Byram Drought Index (KBDI) is used to help determine potential for fire risk. It is a numerical index where each number is an estimate of the amount of precipitation, in 100ths of an inch, needed to bring the soil back to saturation. The index ranges from 0 to 800, with 0 representing a saturated soil, and 800 a completely dry soil. The relationship of the KBDI to fire danger is, as the index increases, the vegetation is subjected to increased moisture stress. KBDI levels and its relationship to expected fire potential are reflected in the following:

**KBDI = 0 – 200**: Soil moisture and large class fuel moistures are high and do not contribute much to fire intensity. This is typical of spring dormant season following winter precipitation.

**KBDI = 201 – 400**: Typical of late spring; early growing season. Lower litter and duff layers are drying and beginning to contribute to fire intensity.

**KBDI = 401 – 600**: Typical of late summer, early fall. Lower litter and duff layers contribute to fire intensity and will burn actively.

**KBDI = 601 – 800**: Often associated with more severe drought and increased wildfire occurrence. Intense, deep-burning fires with significant downwind spotting can be expected. Live fuels can also be expected to burn actively at these levels.

There are currently 142 counties, illustrated in Attachment 2, with KBDI values in excess of 400, indicating areas within these counties are beginning to experience dry conditions which could result in an increased fire risk potential.

The Council, which is chaired by Jack Colley, Chief, Governor's Division of Emergency Management, is composed of state agencies concerned with the effects of drought and fire on the citizens of the State of Texas. The attached information was compiled and provided by representatives listed below. Points of contact, telephone numbers, and web site addresses are also provided.

Jack Colley, Chief, Governor's Division of Emergency Management, (512) 424-2443, fax (512) 424-2444, web site: <u>http://www.txdps.state.tx.us/dem</u>

John Sutton, Texas Water Development Board, (512) 463-7988, fax (512) 463-9893, web site: <u>http://www.twdb.state.tx.us</u>

Chris Loft, Texas Commission on Environmental Quality, (512) 239-4715, fax (512) 239-4770, web site: <u>http://www.tceq.state.tx.us</u>

Richard Egg, Texas State Soil & Water Conservation Board, (254) 773-2250, fax (254) 773-3311, web site: http://www.tsswcb.state.tx.us

Lance Williams, Texas Department of Agriculture, (512) 463-3285, fax (800) 835-2981, web site: <u>http://agr.state.tx.us</u>

Dr. Travis Miller, Texas AgriLife Extension Service, (979) 845-4808, fax (979) 845-0456, web site: <u>http://texasextension.tamu.edu</u>

Cindy Loeffler, Texas Parks & Wildlife Department, (512) 912-7015, fax (512) 707-1358, web site: <u>http://www.tpwd.state.tx.us</u>

Edward T. Morris, Department of Housing and Community Affairs, (512) 475-3329, fax (512) 475-7498, web site: <u>http://www.tdhca.state.tx.us</u>

Carla Baze, Texas Department of Transportation, (512) 416-3270, fax (512)416-2941, web site: <u>http://www.txdot.state.tx.us</u>

Michael Dunivan, Texas Forest Service, (830) 997-5426, web site: <u>http://txforestservice.tamu.edu</u>

Paul Tabor, Texas Department of State Health Services, (512) 458-7126, fax (512) 458-7472, web site: <u>http://www.dshs.state.tx.us/</u>

Thomas Walker, Office of the Governor, Economic Development & Tourism, (512) 936-0169, fax (512) 936-0141, web site: <u>http://www.governor.state.tx.us/divisions/ecodev</u>

David A. Van Dresar, Texas Alliance of Groundwater Districts, (979) 968-3135, fax (979) 968-3194, web site: <u>http://www.texasgroundwater.org/</u>

Dr. John W. Nielsen-Gammon, Office of the State Climatologist, (979) 862-2248, fax (979) 862-4466, web site: <u>http://www.met.tamu.edu/osc/</u>

Gus Garcia, Office of Rural Community Affairs, (512) 936-7876, fax (512) 936-6776, web site: <u>http://www.orca.state.tx.us</u>

#### CC:

Amy Jeter, Committee Clerk, Senate Finance Committee Sarah Hicks, Committee Director, Senate Finance Committee Teddy Carter, Committee Clerk, Senate Natural Resources Committee Amy Peterson, Committee Clerk, House Appropriations Hope Wells, Committee Clerk, House Appropriations Steven Schar, Committee Clerk, House Agriculture and Livestock Committee Anne Creixell, Committee Clerk, House Agriculture and Livestock Committee Zak Covar, Policy Advisor for TCEQ Issues, Governor's Policy Office Auburn Mitchell, Policy Advisor for Agriculture/TDA, Governor's Policy Office Rob Johnson, Lt. Governor's Chief of Staff Carmen Cernosek, Lt. Governor's Natural Resources Policy Analyst Shane Linkous, Deputy Division Chief, Intergovernmental Relations, Attorney General's Office Allan B. Polunsky, Chairman, Public Safety Commission Louis E. Sturns, Member, Public Safety Commission Colonel Stanley Clark, Interim Director, Department of Public Safety Lieutanant Colonel Lamar Beckworth, Interim Assistant Director, Department of Public Safety Lori Gabbert,, Budget Analyst, Legislative Budget Board (LBB-DPS) Tom Lambert, Budget Analyst, Legislative Budget Board (LBB-TCEQ) Ed Perez, Executive Director, Texas Office of State-Federal Relations, Washington, DC

Brandon Steinmann, Director, Texas Office of State-Federal Relations, Austin, Texas



Attachment 2 Counties with High to Extreme Fire Danger





DROUGHT PREPAREDNESS COUNCIL

RICK PERRY Governor 5805 N. Lamar Blvd.

P.O. Box 4087 Austin, Texas 78773-0220 Phone: (512) 424-2138 Fax: (512) 424-2444 February 12, 2009 JACK COLLEY Council Chairman

TO: The Honorable Rick Perry, Governor, State of Texas

The Honorable David Dewhurst, Lieutenant Governor, State of Texas

Ms. Esperanza Andrade, Secretary of State, State of Texas

The Honorable Robert Duncan, President Pro-Tempore of the Senate, State of Texas

The Honorable Joe Straus, Speaker of the House, State of Texas

The Honorable Steve Ogden, Chairman, Senate Finance Committee, State of Texas The Honorable Kip Averitt, Chairman, Senate Natural Resources Committee, State of Texas The Honorable John Carona, Chairman, Senate Committee on Transportation & Homeland Security, State of Texas

The Honorable Jim Pitts, Chairman, House Appropriations Committee, State of Texas The Honorable Allan Ritter, Chairman, House Natural Resources Committee, State of Texas The Honorable Yvonne Gonzalez-Toureilles, Chairman, House Agriculture & Livestock Committee, State of Texas

The Honorable Pete Gallego, Chairman, House Criminal Jurisprudence Committee, State of Texas

Mr. Jay Kimbrough, Chief of Staff, Office of the Governor

Mr. Steven McGraw, Director, Texas Governor's Office of Homeland Security

FROM: Chief Jack Colley, Chairman, Drought Preparedness Council

# SUBJECT: Statewide Drought Situation Report

Jack Colley, Chairman Governor's Division of Emergency Mgmt

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Thomas Walker, Member Office of the Governor Economic Development & Tourism

Gus Garcia, Member Office of Rural Community Affairs Richard Egg, Member State Soil & Water Conservation Board

Cindy Loeffler, Member Texas Parks & Wildlife Department

Paul Tabor, Member Texas Department of State Health Services

Edward T. Morris, Member Texas Department of Housing and Community Affairs

Dr. John W. Nielsen-Gammon, Member Office of the State Climatologist

1. NEXT COUNCIL MEETING

March 12, 2:00 p.m., Governor's Conference Room of the Governor's Division of Emergency Management, State Operations Center, Texas Department of Public Safety Headquarters, 5805 N. Lamar Blvd., Austin, Texas. At this time, the Council will continue to meet on a monthly basis.

#### 2. GENERAL CONDITIONS

January 2009 continued with below normal precipitation across all of Texas, worsening a drought that continues to expand in size and magnitude. According to the Advanced Hydrologic Prediction Center, less than 10% of the State received at least one inch of rainfall. As of February 3, 2009, 95.4% of Texas was classified as being at least "Abnormally Dry" according to the United States Drought Monitor (USDM). The current La Niña phase of the El Niño-Southern Oscillation (ENSO) is firmly entrenched and continued to provide Texas with the abnormally dry weather characteristic of this ENSO pattern.

The majority of January precipitation was on January 6<sup>th</sup> and 7<sup>th</sup> as a cold front swept across the eastern half of the State. Parts of drought stricken Central Texas received 0.05" of precipitation and areas of Northeast Texas received over an inch. There was little measurable precipitation across the entire State the following three weeks. A very strong front pushed from north to south across Texas on the 27<sup>th</sup> and 28<sup>th</sup>, bringing a significant and deadly ice storm to North Texas.

West Texas was very dry, which was reflected by the climate division averages. The Trans Pecos region received no precipitation, the High Plains region received 0.01", and the Low Rolling Plains region received 0.02". The South Central Texas total rainfall of 0.31" was only 14% of normal January precipitation. This lack of precipitation intensified an already "Exceptional Drought". The past four to five months in South Central Texas were historically dry and rank only behind the same months from 1917-1918 in terms of dryness.

The percentage of Texas with the "Exceptional Drought" classification expanded from 4.2% to 6.7% during January. The Low Rolling Plains were classified as "Abnormally Dry" at the beginning of the month, but a lack of January precipitation left this region in a "Severe Drought" by the end of the month. "Severe Drought" covered 42.6% and "Moderate Drought" covered 66.8% of Texas by the end of January, compared to 15.0% and 24.5%, respectively, at the beginning of the month.

The ENSO cycle is forecast to be in a negative phase through early spring according to the Climate Prediction Center (CPC), which issued its first ever La Niña advisory on February 5 under its new ENSO Alert System. The current one-month forecast from the CPC calls for an equal chance of below normal, near normal, and above normal precipitation across the northern half of Texas, and a 33-40% chance of below normal February precipitation across the southern half of the State.

The three-month outlook calls for a 33-40% chance of below normal precipitation for most of West Texas and a greater than 40% chance of below normal precipitation in the Trans Pecos region. The remainder of the State has an equal chance of below normal, near normal, and above normal precipitation. The area of "Moderate" to "Exceptional Drought" is expected to persist in areas already affected and develop in the Trans Pecos region as a result of the dry conditions expected in the next few months.

# 3. OVERALL STATEWIDE DROUGHT CONDITIONS

According to the Palmer Drought Severity Index (PDSI), seven regions were in a dry spell/drought. The South Central region was in a "Severe Drought" condition and the North Central and Edwards Plateau regions were in a "Moderate Drought". The Upper Coast and Southern regions were under "Mild Drought" conditions and the Lower Rolling Plains and Trans-Pecos regions were under "Incipient Dry" conditions. The remainder of the State was

under either "Near Normal" or "Wet Spell" conditions, including the Lower Valley region which is under "Moderate Wet" conditions. The PDSI varies from extremely wet, very wet, moderately wet, slightly wet, incipient wet spell, near normal, incipient dry spell, mild drought, moderate drought, severe drought, and extreme drought in order of increasing severity.

As of January 31, the Crop Moisture Index (CMI) indicated all regions were near normal.

According to the Six-Month Standardized Precipitation Index, the South Central region was classified as "Severely Dry" and the North Central region as "Moderately Dry". All other regions were "Near Normal". The SPI varies in categories of extremely wet conditions, very wet, moderately wet, near normal, moderately dry and, severely dry, extremely dry in order of increasing severity.

The Keetch-Byram Drought Index (KBDI) indicates an extreme fire danger in the South Central region, a very high fire risk in the Edwards Plateau and Southern regions, high in the North Central, Trans-Pecos, Upper Coast, and Lower Valley regions, and above average in the Low Rolling Plains region. The KBDI is a drought index specifically used to describe potential or expected fire behavior. The index is classified as Low, Moderate, High or Extreme fire danger, in order of increasing severity.

# 4. WATER UTILITY STATUS

February began with 102 public water systems requiring customers to conserve water by following water use restrictions. Of those systems, 72 asked customers to follow a mandatory watering schedule and 30 asked for voluntary reductions in usage.

Since the first of the year, very little rain has fallen in the State. Central Texas is in the grip of a "Severe Drought" resulting in lower available water in lakes, rivers, springs, and water wells. If this pattern continues, additional public water supplies will reach the triggers of their Drought Contingency Plans which institute water restrictions to customers.

# 5. WATER RIGHTS – STATEWIDE

New temporary water use permit applications are reviewed on a site-specific basis and are issued if there is sufficient surplus water at the requested source. Applications for new water use permits and amendments to existing permits remained normal during the month. The water rights owners in the Brazos River Basin, whose permits contain the Hale Clause restrictions, observed less severe stream flow conditions during the winter months. The availability of unappropriated water for new water use permits continued to decrease in all river basins in the State and the search for long-term, dependable alternate sources of water remained a high priority issue.

# 6. WATER RIGHTS - LOWER RIO GRANDE / RIO GRANDE WATERMASTER (RGWM)

**Current Overall Conditions:** As of January 27, 2009, the U.S. combined ownership at Amistad/Falcon stood at 96.20% of conservation capacity or 3,507,942 acre-feet of new temporary conservation capacity. This is up from 102.44% or 3,474,703 acre-feet from a year ago at this time. Overall, the system is holding 97.45% or 6,202,742 acre-feet of conservation capacity with Amistad at 97.70% or 3,472,929 acre-feet and Falcon at 98.29% or 2,892,065 acre-feet. Mexico has 98.56% or 2,679,397 acre-feet of the water it could store at Amistad/Falcon.

**Allocations:** As of the printing of the January ownership report, the U.S. allocated in excess of 795,527 acre-feet for irrigation and mining. The U.S. continued to have an amount in excess of 722,940 acre-feet for future allocations in 2009.

**Storage & Loss Amistad vs. Falcon:** The U.S. is currently storing approximately 1.87 million acre-feet or 96.2% at Amistad, and approximately 1.62 million acre-feet or 96.2% at Falcon.

Evaporation and seepage losses at Amistad YTD were 57,536 acre-feet. During the same period, the U.S. lost 61,923 acre-feet at Falcon. The ratio of loss between Amistad and Falcon continued to be 1:2, consistent with Amistad being twice as efficient in overall storage and loss.

**Releases to Meet Demands:** Mexico released 9,647 acre-feet from Amistad and 112,668 acre-feet from Falcon for Mexico needs. The U.S. released 37,367 acre-feet from Amistad and 96,563 acre-feet from Falcon for U.S. needs. Combined with gains between Amistad and Falcon, U.S. inflows to Falcon totaled 79,141 acre-feet. So far, the U.S. met 90% of overall needs in the middle and Lower Rio Grande directly from middle Rio Grande and Amistad inflows this year. The movement of water from Amistad was primarily driven by the excess amount in storage and the need to keep it below conservation capacity, particularly when U.S. is occupying Mexico's space in Amistad.

**Upper Rio Grande (New Mexico):** Currently, Elephant Butte in New Mexico is storing 659,106 acre-feet or 32.57% and Caballo Dam, downstream of Elephant Butte, is storing 23,511 acre-feet or 10.36%. This water storage, in part, was used to meet water needs in the El Paso area.

**Outlook:** All active accounts began 2009 with 100% usable balances. The U.S. is operating under temporary conservation levels until level returns to the normal conservation. To help alleviate losses in Falcon, the U.S. continues to monitor ownership and elevation levels in both Falcon and Amistad so that U.S. transfers of water from Amistad to Falcon can be most efficient. Both U.S. reservoirs are considered full as are the majority of the Mexican reservoirs in the Rio Grande Basin. "No Charge Pumping" was declared effective October 26, 2008 from Amistad down to the Gulf for all diversion requests.

# 7. SOUTH TEXAS WATERMASTER – GUADALUPE / LAVACA / SAN ANTONIO / NUECES REGION

The month of January brought very little relief from the current drought conditions. Some light scattered rain fell over South Central Texas but it was not enough to impact the ongoing drought. River flows continue to slowly decline.

Area Counties: Bandera, Blanco, Comal, Kendall and Kerr Counties

**Rainfall and Area Conditions:** The region received varying amounts of precipitation, ranging from 0.33 to 0.50 inches during January. With that rainfall, the Texas Crop Moisture Index in the area of the Hill Country was classified as "Abnormally Dry". Most surface water diversions in the area are for municipal and industrial uses, with a few surface water permit holders irrigating hay and sod fields. The U.S. Drought Monitor indicated the area is currently in "Exceptional" drought conditions.

**Stream Flow Conditions**: The major streams and their tributaries are flowing below average. Most of the major streams showed a slight decrease in flow during January, and the smaller secondary tributaries lost their surface flows.

Site	Ending Flows CFS	Historical Mean CFS
Guadalupe River near Kerrville	50	119
Guadalupe River near Comfort	56	179
Medina River at Bandera	15	116

**Drought Restrictions:** All temporary surface water permits in the Guadalupe River Basin above Canyon Lake and the San Antonio River Basin above Lake Medina were suspended. Because of the low stream flows, some State permit holders reached their flow restrictions and were curtailed from pumping. River flows are monitored on a daily basis.

**Area Counties:** Bee, Goliad, Victoria, Calhoun, Jackson, Refugio, Aransas, San Patricio, Nueces, Kleberg, Jim Wells, Duval, Live Oak, Kenedy, Willacy, Brooks, and Jim Hogg.

**Rainfall and Area Conditions:** This area received little rainfall during the month of January. Some counties in the area didn't receive any rainfall during the month while others experienced scattered rainfall events, mostly ranging from a trace to under an inch. The rainfall events were insufficient to make any impact in the ongoing drought. The rainfall did not provide much soil moisture or runoff into local area streams. The U.S. Drought Monitor indicates that this area ranges from "Abnormally Dry" to "Severe Drought" conditions although some areas are now experiencing "Extreme Drought" conditions. Most of the surface water diversions in the area continued to be for municipal and industrial uses; little irrigational use was noted.

Site (Years of Record)	Beginning Flows CFS	Ending Flows CFS	Last Month CFS	Historical Mean CFS
Guadalupe River near Victoria				
(74)	500	474	479	1,680
San Antonio River near Goliad				
(73)	250	309	253	684
San Antonio River at				
McFaddin below Goliad (2)	270	376	267	546
Guadalupe River near Tivoli				
(2)	700	566*	659	2,450
Mission River near Refugio				
(69)	4.5	3.4	4.5	94
Nueces River at Calallen Dam				
(9)	3	0.72	10	79
Aransas River near Skidmore				
(44)	3.2	3.3	3.2	13

# Stream Flow Conditions:

\*USGS Gage value for 01/27/09

**Corpus Christi Reservoir System:** The Corpus Christi Reservoir System did not receive much inflow during January and the level of the reservoir system continued to drop slightly.

The Corpus Christi Reservoir System is currently at 75.9% of capacity or 722,575 acre-feet, compared to 97.6% of capacity or 929,533 acre-feet, during this same time last year. Choke Canyon is currently at 80.4% of capacity or 558,769 acre-feet, compared to 97.1 capacity or 675,189 acre-feet, during this same time last year. Lake Corpus Christi is currently at 63.7% of capacity or 163,806 acre-feet, compared to 98.9% of capacity or 254,344 acre-feet, last year. Corpus Christi continues to divert much of their monthly water supply needs from Lake Texana.

**Drought Restrictions:** No additional drought restrictions of water rights in this area.

**Area Counties:** Atascosa, Karnes, Gonzales, Wilson, McMullen, Dewitt, Guadalupe, Lavaca, Fayette, Colorado, Wharton, and Jackson.

**Rainfall and Area Conditions:** The southwestern portions of the area received 0.0 to 0.5 inches of rainfall during January, whereas the northeastern portions received 0.5 to 1.5 inches. Soil moisture conditions ranged from fair in the eastern counties of this area to very poor in the central and southern counties of the area. Oat and rye crops are not doing well and farmers are hesitant to begin spring planting due to the extremely dry conditions. Currently, there is very little irrigational activity. Lake Texana is at 70% of capacity which is 38.22 ft. above mean sea level.

According to the U.S. Drought Monitoring System, this area experienced "Abnormally Dry" to "Exceptional" drought conditions.

Site	Ending Flows CFS	Last Month CFS	Historical Mean CFS
San Antonio River near Falls City	255	177	307
Cibolo Creek near Falls City	23	32	33
Guadalupe River near Gonzalez	587	564	1,330
Lavaca River at Edna	1.8	13	72
Navidad River near Halletsville	3.3	3.7	34
Atascosa River near Whitsett	2.3	6.6	13
Frio River near Tilden	14	13	40
Nueces River near Tilden	0.07	0.12	1.9

#### Stream Flow conditions:

Drought Restrictions: There were no additional restrictions on diversions.

Area Counties: Edwards, Real, Kinney, Uvalde, Zavala, Dimmit, La Salle and Webb.

**Rainfall and Area Conditions:** The Southwest Texas area received no relief from the drought conditions during January. There were rain showers reported in the beginning of the month but no precipitation reported in the middle or the end of the month. The range of rainfall in the area was 0.10 to 0.60 inches. Most diversions of surface water were for irrigational use with small amounts for municipal and industrial uses. Crops irrigated in the area were: wheat, sesame seeds, winter rye, hay grazers, and pecans. The U.S. Drought Report indicated this area is experiencing "Abnormally Dry" to "Extreme" drought conditions.

# Stream Flow Conditions:

Site	Ending Flows CFS	Last Month CFS	Historical Mean CFS
Nueces River at Laguna	48	57	102
Nueces River at Brackettville	0.05	0.14	1.2
Nueces River below Uvalde	13	17	60
Frio River at Concan	32	38	89
Sabinal River at Sabinal	0.46	1.6	16
Leona River near Uvalde	19	26	49

Stream flows of intermittent and tributary streams in the area were flowing well below average for this time of year.

**Drought Restrictions:** Permits with stream flow restrictions are being regulated. The Zavala/Dimmit Water District had a rotational diversion schedule on the Nueces River to ensure adequate water for domestic and livestock use.

**Area Counties:** Bastrop, Bexar, Blanco, Caldwell, Comal, Fayette, Frio, Guadalupe, Hays, and Medina.

**Rainfall and Area Conditions:** Well below average monthly rainfall fell across the San Antonio Regional Area during January. Month to date rainfall at the San Antonio International Airport was 0.28 inches. The average for January is 1.66 inches. The U.S. Drought Monitor indicated the San Antonio Regional Area was experiencing "Severe" to "Exceptional" Drought Conditions. This impacted crops, pastures and grasslands, stream flows, and reservoir capacities. Ground moisture was relatively poor due to the lack of rain and cloud cover. Harvests of beets, turnips, cabbage, spinach, garlic, mustard greens, carrots, and Swiss chard were reported with supplemental irrigation.

**Stream Flow Conditions:** The Guadalupe and Blanco Rivers showed the impact of the worsening drought. Small creeks dried and most major streams are beginning to quickly pool or dry up entirely. Municipal use decreased with the shorter days and residential lawns required less irrigation. Industrial use remained constant.

The Canyon Lake Reservoir was at 897.56 feet elevation, impounding 291,845 acre-feet, and was at 77.03% of capacity. On January 30, 2009, the Edwards Aquifer level at the J17 well in Bexar County was 668.8 feet. The historical average for January is 669.7 feet, which is 0.9 feet below the monthly historical average.

Site	Ending Flows CFS	Historical Mean CFS
Blanco River at Wimberley	13	127
San Marcos River at Luling	104	385
Guadalupe River at Spring Branch	55	294
San Marcos Springs	97	175
Comal Springs	291	307

**Drought Restrictions:** Most Temporary Permits were not allowed to divert surface water. Surface water permits are closely monitored to determine if "real time" stream flows are allowed to divert.

Area Counties: Sterling, Tom Green, Irion, Concho, Coke, Glasscock, Runnels, Reagan, and Schleicher.

Rainfall was scarce in the Concho River Valley during January, falling well below the monthly average for the fourth consecutive month. According to information provided by the USDA, the State Drought Monitor Index of the Concho Valley was at "Severe Drought" to "Extreme Drought" conditions.

**Rainfall and Area Conditions:** Rainfall in San Angelo during January was 0.07 inches. Areas surrounding San Angelo received slightly higher rainfall amounts. The historical mean for January is 0.78 inches. Area reservoirs showed slight decreases in the amount of storage from the previous month. Irrigation demand by appropriated surface water rights in the Concho Valley was at a reduced volume, due to timely rains. The Texas Crop Moisture Index indicated soil moisture content was "Abnormally Dry". Winter wheat was planted and established. Irrigational demand by appropriated surface water rights in the Concho Valley was at normal volume to irrigation of wheat crops.

#### Stream Flow Conditions:

Lake Nasworthy is at 82% of capacity or 8,324 acre-feet, O. C. Fisher was at 5% of capacity or 5,904 acre-feet, and Twin Buttes Lake was at 32% of capacity or 58,961 acre-feet.

Site (Years of Record)	Ending Flows CFS	Historical Mean CFS
USGS Gaging System at Spring		
Creek/Twin Buttes (4)	9.7	15
USGS Gaging System at Concho		
River/San Angelo (77)	11	54
USGS Gaging System at South		
Concho/Christoval (73)	6.4	29

**Drought Restrictions:** There were no additional restrictions on diversions in the Concho Valley.

#### 8. UPPER COLORADO (Concho River watershed not included)

The upper Colorado River area received less than normal precipitation during January. The National Weather Service in San Angelo reported monthly precipitation of 0.06 inches, which was 0.76 inches below normal. According to the U.S. Drought Monitor, the drought conditions in the area ranged from "Severe" to "Extreme". Most tributaries in the upper Colorado watershed had diminished flows. However, there were isolated areas that flowed at or above the USGS long-term median. The pool levels of EV Spence and OH Ivie Reservoir decreased during January, reaching levels of 10% and 55% of capacity, respectively.

# 9. TEXAS PANHANDLE AND SOUTHERN HIGH PLAINS

**Amarillo Area:** The Amarillo Region reported the following summary for the Northern panhandle area:

Lake Meredith was at 52.8 feet, down 0.44 feet. Lake Greenbelt ended January at 55.21 feet, down 0.09 feet. The Canadian River upstream of the lake flowed at 25 CFS. Lake MacKenzie was at 70.40 feet, down 0.39 feet. The National Weather Service in Amarillo reported a total rainfall in January of 0.03 inches, which was 0.60 inches below normal.

**Lubbock Area:** Lubbock received only 0.13 inches for the month. The average rainfall for January is 0.50 inches. Similar amounts were recorded throughout the area. The long term drought situation was not changed. All of the communities previously noted as being on mandatory water restrictions remained on those restrictions. No new communities were added to the water restrictions list during January, and none were removed.

Lubbock and Amherst remained on mandatory drought restriction status. Ralls, Crosbyton, Spur, Post, White River WCS, and Valley WSC in the South Plains area remained on voluntary drought restriction status.

**White River Lake:** The Lake's pool elevation was at 2351.7 acre-feet, or 18.5 feet below full. This is a decrease of 0.35 feet from the level at the end of December 2008. White River WSD has groundwater wells on standby to supply water to its customers if the lake level drops below usable levels.

**Lake Alan Henry:** The lake is one foot below full. It is not used for public drinking water supplies at present, but will be utilized for this purpose in the near future.

# 10. AGRICULTURAL CONCERNS

Agricultural conditions continued to decline as the drought spread across the State. No summer annual crops were planted, and dry weather conditions over most of the Rio Grande Valley, the Gulf Coast, Central and North Texas will severely limit progress towards planting. Wheat and oat conditions continued to decline. The conditions of the wheat and oat crops were reported at 38% and 18%, respectively. Top soil moisture ranges from 67% to 99% short to very short in all Texas climate zones. Availability of grazing and/or stock water for livestock was problematic across most of the State, with particularly dire conditions in Central Texas. Livestock producers are utilizing hay and supplemental feed due to lack of grass and winter pasture. Many livestock operators are facing declining availability of water as stock ponds dry out. Some forage remains in parts of East and North Texas, but conditions are poor or very poor over the remainder of the State.

The following agricultural conditions summaries were compiled by Texas AgriLife Extension district reporters this week:

**Central:** Conditions remained very dry and moisture was desperately needed. Warmer temperatures and high winds continued to dry out the pastures. Little farming activity occurred. Hay and feeding programs continued. Most counties were under burn bans. Stock tanks were critically low.

**Coastal Bend:** Drought continued with near normal temperatures. As planting time approached, there was no soil moisture to germinate seed. Corn growers were at a

crossroads whether to plant in dry ground and pre-water or change crop intentions. Livestock were still being supplemented with hay and protein due to lack of forage. Hay was in short supply and cattle were beginning to lose weight. Some cattle were being sold.

**East:** Dry conditions continued. Winter forage was poor due to lack of moisture. Wildfires were still a major concern. Field preparations continued for spring planting. Many producers were waiting for moisture to establish forage varieties. Livestock were in fair to good condition with some supplemental feeding.

**Far West:** No precipitation, and range and pasture conditions were very dry. Several counties put burn bans into effect. Dry land wheat was not sufficient; some stands were dying.

**North:** Soil moisture ranged from adequate to very short in some areas despite the ice storm melt of last week. Some areas saw moderate rain but soils dried very quickly. Small grain crops were mostly in poor condition. Wheat looked better due to a small amount of moisture from the ice melt. Winter greens and lettuce were doing well. Due to lower fertilizer prices, producers were gearing up for corn planting. The pecan harvest was 100% complete. Livestock were in fair to good condition. Supplemental feeding continued, and ponds were getting very low. Feral hogs continued to be a problem, rooting up wheat fields. Range and pasture conditions were fair to poor.

**Panhandle:** Warm weather was followed by much needed rain. Soil moisture was very short across most of the area before the rain. Extremely windy conditions created a high wildfire danger. Cattle were moved off dry land wheat because there was little to nothing to eat in most fields. Some land preparation was taking place for spring crops. Range cattle were being fed supplements.

**Rolling Plains:** As the local dry conditions persisted, area farmers and livestock producers were anxious. The district has not received measurable rainfall since mid-October. The cotton harvest finished up with better than expected yields. Livestock producers were feeling pressure to ship cattle to feed yards, as wheat pastures have not received rain. Most counties remained under a burn ban and pastures have played out. Producers were constantly supplying supplemental feed or shipping cattle due to lack of grazing. Livestock water was nearly depleted. Greenbugs as well as various other aphid species were still present, but in decreased numbers. Wheat curl mites were increasing, especially in lower areas and near rivers and creeks.

**South:** Hot, dry weather and very short soil moisture conditions continued throughout the region. Most field work in the eastern parts of the region halted until conditions improve. In the western parts of the region, crop producers were reporting long-term expenses for irrigation costs. Irrigation was needed for pre-planting and will constantly be needed until crops mature if conditions do not improve. Spinach and cabbage harvesting in the northern parts of the region continued. Potato planting in the northern parts of the region was completed. Harvesting of sugarcane, citrus and vegetables continued in the southern parts of the region. Corn planting was under way, and onions were progressing well. Forage supplies were becoming depleted due to extremely dry range and pasture conditions. Producers were increasing supplemental feeding of their livestock. Rain was desperately needed not only for crop production but also to fill stock tanks for livestock. Ranchers were resorting to using windmills or wells, though the water was of poor quality.

**South Plains:** The region saw above-normal temperatures and windy conditions. A passing front brought from a trace to 0.75 inches of rain. Soil moisture was very short to short. Field activities included shredding of stalks and application of pre-emergence herbicides. Winter wheat was in very poor to poor condition and irrigation continued. Pastures and ranges were in very poor to poor condition. Livestock were in mostly fair to good condition with supplemental feeding continuing.

**Southeast:** The region was extremely dry. It is time for corn planting to begin soon, but soil moisture was too short. The Chambers/Liberty Counties Navigation District will most likely not be able to pump water this spring to crops or livestock due to Hurricane Ike. Lake Anahuac, which supplies the water district, remains salty and needs to be flushed by rain. The Trinity River is another source of water for the water district, but needs several heavy rains to supply sufficient fresh water as well. Hay feeding and land preparation for spring crops continued.

**Southwest:** The region remained completely dry. The last heavy rain was July 2007. The current drought appears more severe than the record drought of 1952-1956. Forage availability was nearly non-existent. Several roadside and field wildfires were reported. High, dry, winds and very dry grass along roadways were increasing the wildfire risk. Ranchers were providing heavy supplemental nutrition to their remaining livestock. Many stock tanks were dry. The soil profile was very dry. Planting spring crops under dry land conditions will be very limited. The cabbage and spinach harvests continued. Potatoes, spring onions, cabbage and spinach made positive progress under heavy irrigation. Planting of irrigated corn and sorghum planting should start soon.

**West Central:** Extremely dry, windy conditions continued. Only irrigated crops were surviving the drought. Rangeland and pastures remained in very poor condition. Stock tanks were dry and supplemental feeding of livestock continued.

# 11. WILDFIRE CONCERNS

The Keetch-Byram Drought Index (KBDI) is used to help determine potential for fire risk. It is a numerical index where each number is an estimate of the amount of precipitation, in 100ths of an inch, needed to bring the soil back to saturation. The index ranges from 0 to 800, with 0 representing a saturated soil, and 800 a completely dry soil. The relationship of the KBDI to fire danger is, as the index increases, the vegetation is subjected to increased moisture stress. KBDI levels and its relationship to expected fire potential are reflected in the following:

**KBDI = 0 – 200**: Soil moisture and large class fuel moistures are high and do not contribute much to fire intensity. This is typical of spring dormant season following winter precipitation.

**KBDI = 201 – 400**: Typical of late spring; early growing season. Lower litter and duff layers are drying and beginning to contribute to fire intensity.

**KBDI = 401 – 600**: Typical of late summer, early fall. Lower litter and duff layers contribute to fire intensity and will burn actively.

**KBDI = 601 – 800**: Often associated with more severe drought and increased wildfire occurrence. Intense, deep-burning fires with significant downwind spotting can be expected. Live fuels can also be expected to burn actively at these levels.

There are currently 139 counties, illustrated in Attachment 2, with KBDI values in excess of 400, indicating areas within these counties are beginning to experience dry conditions which could result in an increased fire risk potential.

The Council, which is chaired by Jack Colley, Chief, Governor's Division of Emergency Management, is composed of state agencies concerned with the effects of drought and fire on the citizens of the State of Texas. The attached information was compiled and provided by representatives listed below. Points of contact, telephone numbers, and web site addresses are also provided.

Jack Colley, Chief, Governor's Division of Emergency Management, (512) 424-2443, fax (512) 424-2444, web site: <u>http://www.txdps.state.tx.us/dem</u>

John Sutton, Texas Water Development Board, (512) 463-7988, fax (512) 463-9893, web site: <u>http://www.twdb.state.tx.us</u>

Chris Loft, Texas Commission on Environmental Quality, (512) 239-4715, fax (512) 239-4770, web site: <u>http://www.tceq.state.tx.us</u>

Richard Egg, Texas State Soil & Water Conservation Board, (254) 773-2250, fax (254) 773-3311, web site: http://www.tsswcb.state.tx.us

Lance Williams, Texas Department of Agriculture, (512) 463-3285, fax (800) 835-2981, web site: <u>http://agr.state.tx.us</u>

Dr. Travis Miller, Texas AgriLife Extension Service, (979) 845-4808, fax (979) 845-0456, web site: <u>http://texasextension.tamu.edu</u>

Cindy Loeffler, Texas Parks & Wildlife Department, (512) 912-7015, fax (512) 707-1358, web site: <u>http://www.tpwd.state.tx.us</u>

Edward T. Morris, Department of Housing and Community Affairs, (512) 475-3329, fax (512) 475-7498, web site: <u>http://www.tdhca.state.tx.us</u>

Carla Baze, Texas Department of Transportation, (512) 416-3270, fax (512)416-2941, web site: <u>http://www.txdot.state.tx.us</u>

Michael Dunivan, Texas Forest Service, (830) 997-5426, web site: <u>http://txforestservice.tamu.edu</u>

Paul Tabor, Texas Department of State Health Services, (512) 458-7126, fax (512) 458-7472, web site: <u>http://www.dshs.state.tx.us/</u>

Thomas Walker, Office of the Governor, Economic Development & Tourism, (512) 936-0169, fax (512) 936-0141, web site: <u>http://www.governor.state.tx.us/divisions/ecodev</u>

David A. Van Dresar, Texas Alliance of Groundwater Districts, (979) 968-3135, fax (979) 968-3194, web site: <u>http://www.texasgroundwater.org/</u>

Dr. John W. Nielsen-Gammon, Office of the State Climatologist, (979) 862-2248, fax (979) 862-4466, web site: <u>http://www.met.tamu.edu/osc/</u>

Gus Garcia, Office of Rural Community Affairs, (512) 936-7876, fax (512) 936-6776, web site: <u>http://www.orca.state.tx.us</u>

#### CC:

Amy Jeter, Committee Clerk, Senate Finance Committee Sarah Hicks, Committee Director, Senate Finance Committee Teddy Carter, Committee Clerk, Senate Natural Resources Committee Amy Peterson, Committee Clerk, House Appropriations Elizabeth Fazio, Committee Clerk, House Natural Resources Committee Jim Terrell, Committee Clerk, House Agriculture and Livestock Committee Andrew Cates, Committee Clerk, House Agriculture and Livestock Committee Andrew Cates, Committee Clerk, House Criminal Jurisprudence Committee Zak Covar, Policy Advisor for TCEQ Issues, Governor's Policy Office Auburn Mitchell, Policy Advisor for Agriculture/TDA, Governor's Policy Office Rob Johnson, Lt. Governor's Chief of Staff Carmen Cernosek, Lt. Governor's Natural Resources Policy Analyst Shane Linkous, Deputy Division Chief, Intergovernmental Relations, Attorney General's Office Elizabeth Anderson, Member, Public Safety Commission Allan B. Polunsky, Chairman, Public Safety Commission Colonel Stanley Clark, Director, Department of Public Safety Lieutanant Colonel Lamar Beckworth, Assistant Director, Department of Public Safety Lori Gabbert, Budget Analyst, Legislative Budget Board (LBB-DPS) Tom Lambert, Budget Analyst, Legislative Budget Board (LBB-TCEQ) Ed Perez, Executive Director, Texas Office of State-Federal Relations, Washington, DC

Brandon Steinmann, Director, Texas Office of State-Federal Relations, Austin, Texas

# Attachment 1 Climatic Regions



Attachment 2 Counties with High to Extreme Fire Danger





**DROUGHT PREPAREDNESS COUNCIL** 

RICK PERRY Governor 5805 N. Lamar Blvd. P.O. Box 4087 Austin, Texas 78773-0220 JACK COLLEY Council Chairman

Austin, Texas 78773-0220 Phone: (512) 424-2138 Fax: (512) 424-2444 April 9, 2009

TO: The Honorable Rick Perry, Governor, State of Texas

The Honorable David Dewhurst, Lieutenant Governor, State of Texas

Ms. Esperanza Andrade, Secretary of State, State of Texas

The Honorable Robert Duncan, President Pro-Tempore of the Senate, State of Texas

The Honorable Joe Straus, Speaker of the House, State of Texas

The Honorable Steve Ogden, Chairman, Senate Finance Committee, State of Texas The Honorable Kip Averitt, Chairman, Senate Natural Resources Committee, State of Texas The Honorable John Carona, Chairman, Senate Committee on Transportation & Homeland Security, State of Texas

The Honorable Jim Pitts, Chairman, House Appropriations Committee, State of Texas The Honorable Allan Ritter, Chairman, House Natural Resources Committee, State of Texas The Honorable Yvonne Gonzalez-Toureilles, Chairman, House Agriculture & Livestock Committee, State of Texas

The Honorable Pete Gallego, Chairman, House Criminal Jurisprudence Committee, State of Texas

Mr. Jay Kimbrough, Chief of Staff, Office of the Governor

Mr. Steven McCraw, Director, Texas Governor's Office of Homeland Security

FROM: Chief Jack Colley, Chairman, Drought Preparedness Council

# SUBJECT: Statewide Drought Situation Report

Jack Colley, Chairman Governor's Division of Emergency Mgmt

Lance Williams, Member Texas Department of Agriculture

Carla Baze, Member Texas Department of Transportation

Chris Loft, Member Texas Commission on Environmental Quality

**Texas Forest Service** 

Quality Michael Dunivan, Member John Sutton, Member Texas Water Development Board

Dr. Travis Miller, Member Texas Cooperative Extension

David A. Van Dresar, Member Texas Alliance of Groundwater Districts

Thomas Walker, Member Office of the Governor Economic Development & Tourism

Gus Garcia, Member Office of Rural Community Affairs Richard Egg, Member State Soil & Water Conservation Board

Cindy Loeffler, Member Texas Parks & Wildlife Department

Paul Tabor, Member Texas Department of State Health Services

Edward T. Morris, Member Texas Department of Housing and Community Affairs

Dr. John W. Nielsen-Gammon, Member Office of the State Climatologist

# 1. NEXT COUNCIL MEETING

April 23, 2:00 p.m., Audit & Inspection Conference Room, Texas Department of Public Safety Headquarters, Building A, 5805 N. Lamar Blvd., Austin, Texas. The Council will continue to meet bi-monthly until further notice.

#### 2. GENERAL CONDITIONS

Precipitation was more plentiful in March 2009 than during the last few months, providing some temporary relief to drought stricken areas. However, it was not enough to break the drought across most of the State, aside from East Texas. A large area of exceptional drought, approximately 7.1% of the State, existed from South Central Texas to the middle Texas coast. A dry March in the panhandle, the southern Rio Grande Valley, and far West Texas was not beneficial to developed drought conditions during the past few months.

An active weather pattern, typical of March weather in Texas, brought numerous cold fronts through the State, with two main periods that brought most of the March precipitation. After a nondescript first ten days of March, a storm system pushed southeastward through the State from March 11-14, bringing much needed precipitation to a large area. Central Texas received 2-5 inches of precipitation on March 12. East Texas was the beneficiary of a cold front that stalled and brought ample rainfall from the 25<sup>th</sup> through the 28<sup>th</sup>, though severe weather reports were numerous during the period.

About 75% of the State was drier than normal according to radar-estimated precipitation from the Advanced Hydrologic Prediction Service (AHPS), though the percentage of the State that received less than 25% of normal precipitation was much smaller than the previous four months. Austin received 3.04 inches of rain and San Antonio received 2.51 inches. However, several more months of at least normal, preferably above normal, precipitation is needed to alleviate the exceptional drought in the area. Also, the historical lack of March precipitation in the Middle Texas coast only served to worsen the exceptional drought.

With the above normal March precipitation in the Edwards Plateau region, the percentage of Texas with D4 drought classification fell from 9.6% to 7.1% during the past month, though this percentage is still higher than at the end of January 2009. The lack of March precipitation in extreme Southern and far West Texas accelerated developing drought conditions. The percentage of Texas with at least severe drought covered 48.3%, unfortunately the highest in the current drought cycle, with 80.6% of the State in at least a moderate drought.

The El Nino-Southern Oscillation (ENSO) cycle is currently in a weak negative phase according to the Climate Prediction Center (CPC), and is expected to weaken further during the upcoming spring. The current one-month forecast from the CPC calls for an equal chance of below normal, near normal, and above normal precipitation across the northeastern half of Texas and a 33-40% chance of below normal April precipitation across the panhandle and South Central Texas. The lower Rio Grande Valley and Trans-Pecos regions that were dry in March have a 40-50% chance of below normal April precipitation. The three-month outlook calls for an equal chance of below normal, near normal, and above normal precipitation across Texas. Persistence of the current drought is expected in most areas, though the next few months could possibly bring some improvement to the situation in Central and North Central Texas.

# 3. OVERALL STATEWIDE DROUGHT CONDITIONS

According to drought indices, the State received slight relief in 6 climate regions due to rainfall in late March. However, drought conditions worsened in the Low Rolling Plains.

According to the Palmer Drought Severity Index (PDSI), by the end of March, all regions with the exception of East Texas, were under "Mild to Moderate Drought" or "Dry Spell" conditions. The South Central region remained under an "Extreme Drought" condition. The Edwards Plateau region reduced from a "Severe Drought" to a "Mild Drought". The PDSI varies from extremely wet, very wet, moderately wet, slightly wet, incipient wet spell, near normal, incipient dry spell, mild drought, moderate drought, severe drought, and extreme drought in order of increasing severity.

According to the Crop Moisture Index (CMI), by the end of March, the Southern and Lower Valley regions were under an "Abnormally Dry" condition. The remaining regions were under "Slightly Dry / Favorably Moist" or "Wet" conditions. By the Texas Water Development Board (TWDB) scale, the CMI varies from flooding, standing water, fields too wet, moisture adequate, mildly dry, abnormally dry, excessively dry, severely dry, and extremely dry in order of increasing severity.

No update is available for the Six-Month Standardized Precipitation Index at the time of report.

The Keetch-Byram Drought Index (KBDI) indicates an extreme fire danger in the Southern Region, a very high fire risk in the South Central and Lower Valley Regions, high in the Lower Rolling Plains, Trans-Pecos, Upper Coast, and the Edwards Plateau Regions, and above average in the North Central and High Plains Regions. The KBDI is a drought index specifically used to describe potential or expected fire behavior. The index is classified as Low, Moderate, High, or Extreme fire danger, in order of increasing severity.

#### 4. WATER UTILITY STATUS

April 2009 began with 106 public water systems requiring customers to conserve water by following water use restrictions. Of those systems, 74 asked customers to follow a mandatory watering schedule and 32 asked for voluntary reductions in usage.

Rain and cooler temperatures in the central portion of the State helped lower outdoor water usage. Weather forecasts; however, continue to call for little or no significant rain, which has been the pattern for the past several months. The outdoor growing season began, which will result in the increase of outside water usage. With the increase in usage and the continued lack of significant rain, it is expected that additional public water systems will reach the triggers of Drought Contingency Plans and place watering restrictions on customers.

# 5. WATER RIGHTS – STATEWIDE

During March, a letter was sent to the surface water right holders of record to provide information of the drought conditions. New temporary water use permit applications are being reviewed on a site-specific basis and issued if there is sufficient surplus water at the requested source. Applications for new water use permits and amendments to existing permits remained normal during the month. The water rights owners in the Brazos River Basin, whose permits contain the Hale Clause restrictions, observed less severe stream flow conditions during the winter months. The availability of unappropriated water for new water use permits contained to decrease in all river basins in the State and the search for long-term, dependable alternate sources of water remained a high priority issue.

#### 6. WATER RIGHTS - LOWER RIO GRANDE / RIO GRANDE WATERMASTER (RGWM)

**Current Overall Conditions:** As of March 28, 2009, the U.S. combined ownership at Amistad/Falcon stood at 93.20% of conservation capacity or 3,398,496 acre-feet of new temporary conservation capacity. This is up from 98.61% or 3,344,979 acre-feet from a year ago at this time. Overall, the system is holding 94.48% or 6,013,847 acre-feet of conservation capacity with Amistad at 97.97% or 3,402,550 acre-feet and Falcon at 92.29% or 2,611,297 acre-feet. Mexico has 96.21% or 2,615,350 acre-feet of the water it could store at Amistad/Falcon.

**Allocations:** As of printing of the March ownership report, all active accounts are currently full. The U.S. allocated 247.088 acre-feet to Class A & B water rights, which include irrigation, mining and recreation. Additionally, the U.S. has an amount in excess of 656,507 acre-feet for future allocations in 2009.

**Storage & Loss Amistad vs. Falcon:** The U.S. is currently storing approximately 1.87 million acre-feet or 96.1% at Amistad, and approximately 1.52 million acre-feet or 89.8% at Falcon.

Evaporation and seepage losses at Amistad YTD were 13,773 acre-feet. During the same period, the U.S. lost 19,785 acre-feet at Falcon. The ratio of loss between Amistad and Falcon continued to be 1:2, consistent with Amistad being twice as efficient in overall storage and loss.

**Releases to Meet Demands:** Mexico released 33,181 acre-feet from Amistad and 256,590 acre-feet from Falcon for Mexico needs. The U.S. released 155,329 acre-feet from Amistad and 327,110 acre-feet from Falcon for U.S. needs. Combined with gains between Amistad and Falcon, U.S. inflows to Falcon totaled 236,161 acre-feet. So far, the U.S. met 50% of overall needs in the middle and Lower Rio Grande directly from middle Rio Grande and Amistad inflows this year.

**Upper Rio Grande (New Mexico):** Currently, Elephant Butte in New Mexico is storing 624,245 acre-feet or 30.85% and Caballo Dam, downstream of Elephant Butte, is storing 38,103 acre-feet or 16.79%. This water storage, in part, was used to meet water needs in the El Paso area.

**Outlook:** All active accounts began 2009 with 100% usable balances. The U.S. is operating under temporary conservation until levels returns to normal conservation. To help alleviate losses in Falcon, the U.S. continued to monitor ownership and elevation levels in both Falcon and Amistad so that U.S. transfers of water from Amistad to Falcon can be most efficient. "No Charge Pumping" was terminated March 28, 2009 from Amistad because the U.S. ownership dropped below 100%. Extremely dry conditions prevailed across Deep South Texas during the month of February. Monthly rainfall over the region was less than a quarter of an inch, with most areas reporting near a tenth of an inch or less. According to the U.S. Drought Monitor, the very dry conditions over Deep South Texas, combined with above normal temperatures, have allowed drought conditions to return to portions of the region. This will likely result in the persistence or worsening of overall drought conditions in Deep South Texas through Summer 2009.

# 7. SOUTH TEXAS WATERMASTER – GUADALUPE / LAVACA / SAN ANTONIO / NUECES REGION

March brought significant rainfall to South Central Texas. The rainfall was helpful; however, drought conditions still remain in the area. "Extreme Drought" and "Exceptional Drought" conditions continue to cover a large portion of the area. The Concho Basin continued to show improvement during the month and received significant rainfall.

Area Counties: Bandera, Blanco, Comal, Kendall and Kerr Counties

**Rainfall and Area Conditions:** This area received 1.5 to 3.25 inches of rain during March. With that rainfall, the Texas Crop Moisture Index classified this area of the Hill Country as "Abnormally Dry" to "Mildly Dry". Most of the surface water diversions in this area were for municipal and industrial uses with a few surface water permit holders irrigating hay and sod fields. The U.S. Drought Monitor indicated this area was currently in "Extreme" to "Exceptional Drought" conditions.

**Stream Flow Conditions**: Even with the increased amount of rainfall in March, the stream flows of the major streams and their tributaries were flowing well below their mean averages. Most of the major streams have shown a slight decrease in flow during the month of March, and the smaller secondary tributaries lost their surface flows.

Site	Ending Flows CFS	Historical Mean CFS
Guadalupe River near Kerrville	50	128
Guadalupe River near Comfort	46	215
Medina River at Bandera	17	173

**Drought Restrictions:** All temporary surface water permits in the Guadalupe River Basin above Canyon Lake and the San Antonio River Basin above Lake Medina were suspended. Because of the low stream flows, some State permit holders reached their flow restrictions and were curtailed from pumping. River flows are monitored on a daily basis.

**Area Counties:** Bee, Goliad, Victoria, Calhoun, Jackson, Refugio, Aransas, San Patricio, Nueces, Kleberg, Jim Wells, Duval, Live Oak, Kenedy, Willacy, Brooks, and Jim Hogg.

**Rainfall and Area Conditions:** This area received some rainfall during the latter part of March. Some counties in this area received only light showers while others received as much as 2-3 inches. The rainfall events did not provide enough moisture to make a significant impact on the ongoing drought. The rainfall did provide some soil moisture and runoff into local area streams, but the stream flows rapidly declined to below average for this time of the year. The U. S. Drought Monitor indicated "Exceptional Drought" conditions extended to counties along the Gulf Coast. Only the southern most counties in this area experienced "Abnormally Dry" conditions, while the counties in the central area of this region experienced "Moderate to Severe Drought" to "Extreme Drought" conditions. Most of the surface water diversions in this area continued to be for municipal and industrial uses, little irrigational use was noted.

# Stream Flow Conditions:

Site (Years of Record)	Beginning Flows CFS	Ending Flows CFS	Last Month CFS	Historical Mean CFS
Guadalupe River near Victoria				
(74)	350	392	475	1,690
San Antonio River near Goliad				
(73)	225	232	310	612
San Antonio River at				
McFaddin below Goliad (2)	260	261	320	447
Guadalupe River near Tivoli				
(2)	615	739	700	1,960
Mission River near Refugio				
(69)	2.5	0.06	3	27
Nueces River at Calallen Dam				
(9)	10	1.9	12	120
Aransas River near Skidmore				
(44)	3.2	3.4	3.2	9.8

**Corpus Christi Reservoir System:** The Corpus Christi Reservoir System received minimal inflow during March and the level of the reservoir system continued to drop. The Corpus Christi Reservoir System is currently at 72.6% of capacity or 691,299 acre-feet, compared to 95.5% of capacity or 909,790 acre-feet, at this time last year. Choke Canyon is currently at 78.1% of capacity or 543,122 acre-feet, compared to 95.1% capacity or 661,249 acre-feet, at this time last year. Lake Corpus Christi is currently at 57.6% of capacity or 148,177 acre-feet, compared to 96.6% of capacity or 248,541 acre-feet, at this time last year. Corpus Christi continued to divert much of their monthly water supply needs from Lake Texana.

**Drought Restrictions:** No additional drought restrictions of water rights in this area.

**Area Counties:** Atascosa, Karnes, Gonzales, Wilson, McMullen, Dewitt, Guadalupe, Lavaca, Fayette, Colorado, Wharton, and Jackson.

**Rainfall and Area Conditions:** The south and southwestern portions of this area received 0.40 to 2.25 inches of rain during March. The north and northeastern portions received 1.40 to 2.4 inches. Soil moisture conditions improved in the area but need follow up rains to maintain the improved conditions. Grain and hay crops faired well but with marginal moisture conditions, the improvement may stall. Irrigational activity increased due to spring planting, but most of the activity was municipal use and only the major agricultural diverters. Lake Texana was at 64% of capacity, which is 36.64 ft. above mean sea level.

According to the U.S. Drought Monitoring System, this area experienced "Severe" to "Exceptional" drought conditions.

# Stream Flow conditions:

Site	Ending Flows CFS	Last Month CFS	Historical Mean CFS
San Antonio River near Falls City	142	139	272
Cibolo Creek near Falls City	24	27	29
Guadalupe River near Gonzalez	576	484	1,470
Lavaca River at Edna	7.7	7.7	79
Navidad River near Halletsville	2.7	3.3	38
Atascosa River near Whitsett	4.9	2.6	13
Frio River near Tilden	3.1	4.9	41
Nueces River near Tilden	0.0	0.0	4.7

**Drought Restrictions:** There were no additional restrictions on diversions.

Area Counties: Edwards, Real, Kinney, Uvalde, Zavala, Dimmit, La Salle and Webb.

**Rainfall and Area Conditions:** The Southwest Texas Area did receive some relief from the drought for the month of March. No rainfall was reported at the beginning of the month. The northern counties saw heavy showers and light showers for the southern counties during mid-month. The month ended with no relief from the drought. The total range of rainfall in the area was from 0.30 to 5.00 inches. Most of the diversions of surface water were for irrigational use, with small amounts for municipal and industrial uses. Crops irrigated in the area include onions, wheat, hay grazers, and pecans. Soil conditions were poor due to the lack of rainfall. The U.S. Drought Report indicated that this area is experiencing "Abnormally Dry" to "Exceptional Drought" conditions.

Site	Ending Flows CFS	Last Month CFS	Historical Mean CFS
Nueces River at Laguna	62	42	128
Nueces River at Brackettville	0.00	0.00	25
Nueces River below Uvalde	10	13	68
Frio River at Concan	42	26	93
Sabinal River at Sabinal	1.3	0.46	25
Leona River near Uvalde	16	13	52

# Stream Flow Conditions:

Stream flows of intermittent and tributary streams in the area were flowing well below average for this time of year.

**Drought Restrictions:** Permits with stream flow restrictions are being regulated. The Zavala/Dimmit Water District had a rotational diversion schedule on the Nueces River to ensure adequate water for domestic and livestock use.

**Area Counties:** Bastrop, Bexar, Blanco, Caldwell, Comal, Fayette, Frio, Guadalupe, Hays, and Medina.

**Rainfall and Area Conditions:** Moderate widespread rainfall fell across the San Antonio Regional Area during March. Month-to-date rainfall measured at the San Antonio

International Airport was 1.45 inches; the average for March is 1.89 inches. The total rainfall to date is 3.32 inches; the normal year to date is 5.24 inches, a departure of -1.92 inches. On March 24, 2009, the U.S. Drought Monitor indicated the San Antonio Regional Area is experiencing "Extreme" to "Exceptional" drought, impacting crops, pastures, grasslands, stream flows, and reservoir capacities. Ground moisture improved with the recent rainfall, many "dry land" farmers plowed fields and spring planting is well underway. Farmers with supplemental irrigation planted corn, milo, green beans, squash, peas, tomatoes, wheat, and hay grazers.

**Stream Flow Conditions:** The Guadalupe and Blanco Rivers continued to show the impact of the worsening drought. Small creeks dried and most major streams are beginning to quickly pool or dry up entirely. Municipal use increased with residential lawn irrigation. Industrial use remained constant.

The Canyon Lake Reservoir was at 897.18 feet elevation, impounding 289,775 acre-feet, and was at 76.48% of capacity. On March 30, 2009, the Edwards Aquifer level at the J17 well in Bexar County was 665.6 feet. The historical average for March is 669.3 feet, which is 3.7 feet below the monthly historical average.

Site	Ending Flows CFS	Historical Mean CFS
Blanco River at Wimberley	10	177
San Marcos River at Luling	94	403
Guadalupe River at Spring Branch	73	362
San Marcos Springs	101	178
Comal Springs	272	306

**Drought Restrictions:** Most Temporary Permits were not allowed to divert surface water. Surface water permits are closely monitored to determine if "real time" stream flows are allowed to divert.

Area Counties: Sterling, Tom Green, Irion, Concho, Coke, Glasscock, Runnels, Reagan, and Schleicher.

The Concho River Valley received above average amounts of rainfall during March. According to information provided by USDA, the State Drought Monitor Index listed the Concho Valley under "Severe" to "Extreme" drought conditions.

**Rainfall and Area Conditions:** Rainfall in San Angelo for the month was 1.47 inches. Areas surrounding San Angelo received slightly higher rainfall amounts. Average rainfall amount for March is 1.08 inches. Total rainfall for the year is 2.02 inches. In 2007, to date, there was only 0.55 inch of rainfall. The average annual rainfall for San Angelo, based on a 100-year record, is 19 inches. Area reservoirs showed decreases in the amount of storage from the previous month's amounts. The Texas Crop Moisture Index indicated the soil moisture content is "Abnormally Dry". Winter wheat was planted and established. Demand by appropriated surface water rights in the Concho Valley was at increased volume due to the wheat crop irrigation.

# Stream Flow Conditions:

Lake Nasworthy is at 83% of capacity or 8,444 acre-feet. O. C. Fisher was at 5% of capacity or 5,616 acre-feet. Twin Buttes Lake was at 31% of capacity or 57,997 acre-feet.

Site (Years of Record)	Ending Flows CFS	Historical Mean CFS
USGS Gaging System at Spring		
Creek/Twin Buttes (6)	6.6	18
USGS Gaging System at Concho		
River/San Angelo (78)	13	15
USGS Gaging System at South		
Concho/Christoval (73)	7.8	19

**Drought Restrictions:** There were no additional restrictions on diversions in the Concho Valley.

#### 8. UPPER COLORADO (Concho River watershed not included)

The upper Colorado River area received more than normal precipitation during March. The National Weather Service in San Angelo reported monthly precipitation of 1.73 inches, which was 0.74 inch above normal. According to the U.S. Drought Monitor, the drought conditions in the area ranged from "Severe" to "Extreme". Most tributaries in the upper Colorado watershed had diminished flows. However, there were isolated areas that flowed at or above the USGS long-term median. The pool levels of EV Spence and OH Ivie Reservoir decreased during March, reaching levels of 9% and 53% of capacity, respectively.

# 9. TEXAS PANHANDLE AND SOUTHERN HIGH PLAINS

**Amarillo Area:** The Amarillo Region reported the following summary for the Northern panhandle area:

Lake Meredith was at 52.09 feet, down 0.57 feet. Lake Greenbelt ended March at 55.06 feet, down 0.08 feet. Lake MacKenzie was at 69.78 feet, down 0.42 feet. The National Weather Service in Amarillo reported a total rainfall during March of 1.01 inches, which was 0.04 inch below normal. Total rainfall since January 1, 2009, is 1.49 inches, which is 0.74 inches below the year-to-date average. Since March 1, 2009, total snowfall for the area was 12.6 inches, which is 10.9 inches above the monthly average.

**Lubbock Area:** Lubbock received only 0.37 inch of rain during the month. The average rainfall for March is 0.76 inch. Similar amounts were recorded throughout the area. The average annual rainfall at this point in the year is 1.97 inches. Lubbock recorded 1.23 inches of precipitation thus far. The long term drought situation was not changed. All communities previously noted as being on mandatory water restrictions remained on those restrictions. No new communities were added to the water restrictions list during March, and none were removed.

Lubbock and Amherst remained on mandatory drought restriction status. Ralls, Crosbyton, Spur, Post, White River WCS, and Valley WSC in the South Plains area remained on voluntary drought restriction status.

White River Lake: The lake's pool elevation was at 2351.1 acre-feet, or 18.9 feet below full, the same level as it was at the end of February 2009. White River WSD has groundwater wells on standby to supply water to its customers if the lake level drops below usable levels.

**Lake Alan Henry:** The lake is one foot below full. It is not used for public drinking water supplies at present, but will be utilized for this purpose in the near future.

#### 10. WILDLIFE CONCERNS

According to Texas Parks and Wildlife biologists, continued dry range conditions could have a negative impact on wild turkey production and hunting prospects for spring turkey season. If portions of Texas remain parched, particularly the Southern region, the Rio Grande turkey breeding activity and nesting effort will be greatly reduced or nonexistent. At J.D. Murphree Wildlife Management Area near Port Arthur, drought conditions worsened. Due to a lack of rainfall, freshwater marshes at Murphree WMA which were inundated by Hurricane Ike were not flushed of saltwater. The lack of flushing is killing plants and damaging soil chemistry. The area's brackish marshes were saltier than usual for this time of year, suffering the same stresses as freshwater marshes.

At the Aransas National Wildlife Refuge, drought may have contributed to the worst winter on record for the world's only wild flock of endangered whooping cranes. After an encouraging multi-year comeback in which flock numbers grew each year, this was the first decline since 2001. Only 249 birds will return north to Canada this spring, down from 270 which arrived in Texas last fall.

At Garner State Park in the Edwards Plateau, there were reports of non-native axis deer dying from starvation coupled with cold weather earlier this year. TPWD wildlife biologists reported range conditions were poor, prickly pear was thin due to the lack of water, and feral hogs were thin and drawn down. Native whitetail deer still appear in decent condition but may perish if the drought situation continues.

#### **10. AGRICULTURAL CONCERNS**

Thundershowers provided some relief to portions of North Central and East Texas. However, most of the Southern, Southwestern, West and the Panhandle regions did not receive significant precipitation during the last month, outside of the heavy snows in the northern panhandle. Parts of North, Northeast and East Texas received heavy rains which relieved the majority of the immediate concerns related to agricultural drought. Approximately 48% of the State is in severe to exceptional drought, up from 44% last month. Lack of water, forage and hay resulted in the loss of thousands of cattle as livestock operators struggled to maintain herds in desperate conditions. Livestock auctions were active as ranchers continue to liquidate herds. Dry conditions, wind and warm weather also created dangerous fire conditions on farms and ranches.

The wheat and oat crop conditions continued to decline across most of the State, although significant improvement was observed in North Central and East Texas. According to the Texas Agricultural Statistics Service, 64% of the wheat and 83% of the oat crop was rated poor to very poor. Freeze losses associated with the arctic front on the last week of March were exacerbated by advance maturity associated with drought. Texas will have a very limited dryland wheat or oat crop, with the primary area having average or above average yields in North Central and East Texas.

The majority of the field crop acreage planted on the Gulf Coast and Central Texas is either in dry seedbeds or marginal moisture near the surface associated with light rains. Most of this crop is questionable with respect to either germination or survival.

The following agricultural conditions summaries were compiled by Texas AgriLife Extension district reporters this week:
**Central:** A freeze threatened much of the small-grain crop, and there were signs of freeze damage to corn as well. Most corn will survive in soils with adequate moisture. High winds dried soils of moisture previously received. Livestock were in fair condition, and producers continued to provide supplemental feed and protein.

**Coastal Bend:** A small amount of rain was received but not enough to make a difference. Windy weather aggravated the dry conditions. Some producers planted spring crops, hoping for more rain. Pastures remained bare. Cattle were sold or moved to other locations where there was forage.

**East:** The area received 0.5-3 inches of rain. Pastures and stock tanks showed improvement, but some counties still need more rain. High winds caused light damage to barns and trees. Producers planted vegetable crops, but growth was slowed by cool days and nights. Cattle were in fair to good condition. Feral hog activity increased dramatically.

**Far West:** Precipitation was limited across the region, and dry and windy conditions prevailed. Rangeland remained very dry. There was a high danger of wildfires. Fruit trees survived a freeze without much damage. Pecan trees began to leaf out. Dryland wheat was severely affected by drought, and some may be baled for hay. Very little if any wheat was expected to be cut for grain. Irrigated wheat appeared productive, but economics may dictate that some of it may also be baled for hay.

**North:** Soil moisture ranged from short to surplus. Though soils were wet from the frequent rains, vegetation/growth is shorter than normal due to earlier drought conditions. The recent rains helped the wheat considerably and it was heading or near heading as the hard freeze impacted north Texas. Wheat losses estimates were not finalized, and ranged from 0% to 100%, largely dependent on location and stage of maturity. Corn planting neared completion. Approximately 50% of corn was already planted and emerged in fair to good condition. Dairymen harvested wheat and oats for silage. Forages improved, and some producers reduced or ended their supplemental feeding programs. Livestock were in fair to good condition. Some time will be required to tell whether the cooler weather may have harmed the peach production.

**Panhandle:** Cold weather, high winds and as much as 12 inches of snow came to the region, but soil moisture remained short. Producers continued field work until the blizzard put a halt to all activities. Winter wheat was stressed due to adverse weather conditions and increased insect activity. Producers sprayed some wheat for greenbugs and Russian wheat aphids. There were also signs of disease in wheat. Fields were pre-irrigated for corn plantings.

**Rolling Plains:** Though a small amount of moisture was received in the form of snow, sleet and rain, conditions remained very dry throughout the region. Temperatures widely fluctuated day to day, but the wind was always blowing, drying out what moisture was received. Pastures were in poor condition with little to no grazing, and ranchers continued to supply supplemental feed daily. Farmers applied pre-emergence herbicides and produced other field work. The winter wheat crop reached an average height of only 6 inches due to drought stress and began to head out. Freeze losses in drought affected wheat are expected to be significant. Producers turned cattle in on the winter wheat in the hope of benefiting from the crop. Grass fires sprung up throughout the district. The largest fire, eight miles south of Archer City, consumed 8,000 acres. Stock tanks were very low. **South:** Mild temperatures, a lot of wind, and no rainfall prevailed in the region. Soil moisture ranged from short in the northern parts of the region to very short in the eastern, western and southern parts of the region. Producers in the northern parts of the region planted haygrazer (a sorghum-sudan crop used for grazing, silage and hay). Corn planting in the northern counties was nearly completed. Potato crops developed past the flowering stage, and earlier-planted grain emerged, but with skimpy stands. In the western parts of the region, the last of the spinach fields were plowed under. Corn, wheat and cotton progressed well under irrigation. Cabbage harvesting was ongoing, and onions showed productive bulb development. The sugarcane harvesting was finished; the citrus harvest wound down, and the vegetable harvest continued. Supplemental feeding of livestock continued throughout the region. However, feeding was slightly reduced in some sections of the region where higher levels of rainfall were reported.

**South Plains:** The region experienced dry weather, with wind ranging from 50-60 mph. Temperatures dropped below freezing. AgriLife agronomists reported widespread freeze injury due to the cold weather in late March compounded by advanced maturity associated with drought. Freeze losses averaged 15% to 25% with some fields in excess of 75%. Soil moisture ranged from very short to short. Winter wheat was in very poor to poor condition due to drought and freeze injury. Pastures and rangeland were in very poor to poor condition. Livestock were in mostly fair to good condition with supplemental feeding continuing.

**Southeast:** The region was extremely dry. Corn planting should begin soon, but soil moisture remains too short. The Chambers/Liberty Counties Navigation District will most likely be unable to pump water this spring to crops or livestock due to Hurricane Ike. Lake Anahuac, which supplies the water district, remains salty and needs to be flushed by rain. The Trinity River is another source of water for the water district, but needs several heavy rains to re-supply sufficient fresh water as well. Hay feeding and land preparation for spring crops continued.

**Southwest:** The region remained completely dry. The last heavy rain was July 2007. The current drought appears more severe than the record drought of 1952-1956. Forage availability was nearly non-existent. Several roadside and field wildfires were reported. High, dry, winds and very dry grass along roadways increased the wildfire risk. Ranchers were providing heavy supplemental nutrition to their remaining livestock. Many stock tanks were dry. The soil profile was very dry. Planting spring crops under dry land conditions will be very limited. The cabbage and spinach harvests continued. Potatoes, spring onions, cabbage and spinach made positive progress under heavy irrigation. Planting of irrigated corn and sorghum planting should start soon.

**West Central:** Cool temperatures with dry, windy conditions continued. Very little rainfall was reported, and the risk of wildfires was extreme. High winds depleted soils of moisture in most areas. Wheat started to head out, but did not look promising as to yields or profitability. Some producers applied herbicides for weed control. The green up of native and improved pasture grasses slowed. Livestock remained in fair to poor condition with producers continuing to supply supplemental feeding.

#### 12. WILDFIRE CONCERNS

The Keetch-Byram Drought Index (KBDI) is used to help determine potential for fire risk. It is a numerical index where each number is an estimate of the amount of precipitation, in 100ths of an inch, needed to bring the soil back to saturation. The index ranges from 0 to

800, with 0 representing a saturated soil, and 800 a completely dry soil. The relationship of the KBDI to fire danger is, as the index increases, the vegetation is subjected to increased moisture stress. KBDI levels and its relationship to expected fire potential are reflected in the following:

**KBDI = 0 - 200**: Soil moisture and large class fuel moistures are high and do not contribute much to fire intensity. This is typical of spring dormant season following winter precipitation.

**KBDI = 201 – 400**: Typical of late spring; early growing season. Lower litter and duff layers are drying and beginning to contribute to fire intensity.

**KBDI = 401 – 600**: Typical of late summer, early fall. Lower litter and duff layers contribute to fire intensity and will burn actively.

**KBDI = 601 – 800**: Often associated with more severe drought and increased wildfire occurrence. Intense, deep-burning fires with significant downwind spotting can be expected. Live fuels can also be expected to burn actively at these levels.

There are currently 99 counties, illustrated in Attachment 2, with KBDI values in excess of 400, indicating areas within these counties are beginning to experience dry conditions which could result in an increased fire risk potential.

The Council, which is chaired by Jack Colley, Chief, Governor's Division of Emergency Management, is composed of state agencies concerned with the effects of drought and fire on the citizens of the State of Texas. The attached information was compiled and provided by representatives listed below. Points of contact, telephone numbers, and web site addresses are also provided.

Jack Colley, Chief, Governor's Division of Emergency Management, (512) 424-2443, fax (512) 424-2444, web site: <u>http://www.txdps.state.tx.us/dem</u>

John Sutton, Texas Water Development Board, (512) 463-7988, fax (512) 463-9893, web site: <u>http://www.twdb.state.tx.us</u>

Chris Loft, Texas Commission on Environmental Quality, (512) 239-4715, fax (512) 239-4770, web site: <u>http://www.tceq.state.tx.us</u>

Richard Egg, Texas State Soil & Water Conservation Board, (254) 773-2250, fax (254) 773-3311, web site: <u>http://www.tsswcb.state.tx.us</u>

Lance Williams, Texas Department of Agriculture, (512) 463-3285, fax (800) 835-2981, web site: <u>http://agr.state.tx.us</u>

Dr. Travis Miller, Texas AgriLife Extension Service, (979) 845-4808, fax (979) 845-0456, web site: <u>http://texasextension.tamu.edu</u>

Cindy Loeffler, Texas Parks & Wildlife Department, (512) 912-7015, fax (512) 707-1358, web site: <u>http://www.tpwd.state.tx.us</u>

Edward T. Morris, Department of Housing and Community Affairs, (512) 475-3329, fax (512) 475-7498, web site: <u>http://www.tdhca.state.tx.us</u>

Carla Baze, Texas Department of Transportation, (512) 416-3270, fax (512)416-2941, web site: <u>http://www.txdot.state.tx.us</u>

Michael Dunivan, Texas Forest Service, (830) 997-5426, web site: <u>http://txforestservice.tamu.edu</u>

Paul Tabor, Texas Department of State Health Services, (512) 801-9816, fax (512) 458-7211, web site: <u>http://www.dshs.state.tx.us/</u>

Thomas Walker, Office of the Governor, Economic Development & Tourism, (512) 936-0169, fax (512) 936-0141, web site: <u>http://www.governor.state.tx.us/divisions/ecodev</u>

David A. Van Dresar, Texas Alliance of Groundwater Districts, (979) 968-3135, fax (979) 968-3194, web site: <u>http://www.texasgroundwater.org/</u>

Dr. John W. Nielsen-Gammon, Office of the State Climatologist, (979) 862-2248, fax (979) 862-4466, web site: <u>http://www.met.tamu.edu/osc/</u>

Gus Garcia, Office of Rural Community Affairs, (512) 936-7876, fax (512) 936-6776, web site: <u>http://www.orca.state.tx.us</u>

CC:

Amy Jeter, Committee Clerk, Senate Finance Committee Sarah Hicks, Committee Director, Senate Finance Committee Teddy Carter, Committee Clerk, Senate Natural Resources Committee Amy Peterson, Committee Clerk, House Appropriations Elizabeth Fazio, Committee Clerk, House Natural Resources Committee Jim Terrell, Committee Clerk, House Agriculture and Livestock Committee Andrew Cates, Committee Clerk, House Criminal Jurisprudence Committee Zak Covar, Policy Advisor for TCEQ Issues, Governor's Policy Office Auburn Mitchell, Policy Advisor for Agriculture/TDA, Governor's Policy Office Rob Johnson, Lt. Governor's Chief of Staff Carmen Cernosek, Lt. Governor's Natural Resources Policy Analyst Shane Linkous, Deputy Division Chief, Intergovernmental Relations, Attorney General's Office Allan B. Polunsky, Chairman, Public Safety Commission Carin M. Barth, Member, Public Safety Commission Ada Brown, Member, Public Safety Commission C. Tom Clowe, Jr., Member, Public Safety Commission John Steen, Member, Public Safety Commission Colonel Stanley Clark, Director, Department of Public Safety Lieutanant Colonel Lamar Beckworth, Assistant Director, Department of Public Safetv Lori Gabbert,, Budget Analyst, Legislative Budget Board (LBB-DPS) Tom Lambert, Budget Analyst, Legislative Budget Board (LBB-TCEQ) Ed Perez, Executive Director, Texas Office of State-Federal Relations, Washington, DC Brandon Steinmann, Director, Texas Office of State-Federal Relations, Austin, Texas

## Attachment 1 Climatic Regions



Attachment 2 Counties with High to Extreme Fire Danger





DROUGHT PREPAREDNESS COUNCIL

**RICK PERRY** Governor

5805 N. Lamar Blvd.

JACK COLLEY Council Chairman

P.O. Box 4087 Austin, Texas 78773-0220 Phone: (512) 424-2138 Fax: (512) 424-2444 May 26, 2009

**TO:** The Honorable Rick Perry, Governor, State of Texas

The Honorable David Dewhurst, Lieutenant Governor, State of Texas

Ms. Esperanza Andrade, Secretary of State, State of Texas

The Honorable Robert Duncan, President Pro-Tempore of the Senate, State of Texas

The Honorable Joe Straus, Speaker of the House, State of Texas

The Honorable Steve Ogden, Chairman, Senate Finance Committee, State of Texas The Honorable Kip Averitt, Chairman, Senate Natural Resources Committee, State of Texas The Honorable John Carona, Chairman, Senate Committee on Transportation & Homeland Security, State of Texas

The Honorable Jim Pitts, Chairman, House Appropriations Committee, State of Texas The Honorable Allan Ritter, Chairman, House Natural Resources Committee, State of Texas The Honorable Yvonne Gonzalez-Toureilles, Chairman, House Agriculture & Livestock Committee, State of Texas

The Honorable Pete Gallego, Chairman, House Criminal Jurisprudence Committee, State of Texas

Mr. Jay Kimbrough, Chief of Staff, Office of the Governor

Mr. Steven McCraw, Director, Texas Governor's Office of Homeland Security

FROM: Chief Jack Colley, Chairman, Drought Preparedness Council

## **SUBJECT:** Statewide Drought Situation Report

Jack Colley, Chairman Governor's Division of Emergency Mamt

Lance Williams, Member Texas Department of Agriculture

Carla Baze, Member Texas Department of Transportation

Chris Loft, Member Texas Commission on Environmental Quality

Michael Dunivan, Member **Texas Forest Service** 

John Sutton, Member Texas Water Development Board

Dr. Travis Miller, Member **Texas Cooperative Extension** 

David A. Van Dresar, Member **Texas Alliance of Groundwater Districts** 

Thomas Walker, Member Office of the Governor Economic Development & Tourism

Gus Garcia, Member Office of Rural Community Affairs

Richard Egg, Member State Soil & Water Conservation Board

Cindy Loeffler, Member Texas Parks & Wildlife Department

Paul Tabor, Member Texas Department of State Health Services

> Alfonso Royal, Member Texas Department of Housing and **Community Affairs**

Dr. John W. Nielsen-Gammon, Member Office of the State Climatologist

1. NEXT COUNCIL MEETING

June 11, 2009, 2:00 p.m., Audit & Inspection Conference Room, Texas Department of Public Safety Headquarters, Building A, 5805 N. Lamar Blvd., Austin, Texas.

## 2. GENERAL CONDITIONS

Several storm systems traveled through Texas during April bringing much needed precipitation to drought-stricken areas in the Edwards Plateau and northern South Central Texas. However, a drier than normal April in the southern half of South Central Texas, the Southern, and Lower Valley regions intensified the drought in these areas. Dry weather also intensified severe drought conditions in the Trans-Pecos region and the extreme drought in western North Central Texas. April began with 7.08% of the State experiencing exceptional drought conditions. By the end of the month, it had risen to 9.73% and shifted to the southwest.

The majority of Southeast Texas, Central Texas, and the Edwards Plateau saw above normal precipitation in April. Eleven tornadoes struck the panhandle on April 16 and more than five inches of rain was reported in areas near Lubbock. The active weather moved to the southeast with heavy rain in Central and Southeast Texas along a stationary front on April 17 and ahead of a cold front on April 18. Radar estimates from the Advanced Hydrologic Prediction Service (AHPS) indicated more than a foot of rainfall fell in areas west of Houston. Over five inches of rain fell near Galveston Bay on April 24, and the Edwards Plateau region received significant precipitation, two to five inches, on April 26. Central and Southeast Texas were again hit hard on April 27, with eight to ten inches of rain west of Houston, and on April 28, with four to eight inches north of College Station. April 28 also brought heavy precipitation to an area near Wichita Falls designated with extreme drought and also devastated by wildfires in April. The active second half of April ended with extremely heavy rain, six to ten inches on April 29 in the Red River region, north of the Metroplex.

The extreme precipitation caused widespread flooding across Central and Southeast Texas, particularly in Houston. Overall, the above normal precipitation in these areas was beneficial for agricultural purposes. Streamflow conditions in South Central Texas and the Coastal Bend were generally very low despite normal to above normal precipitation upstream the past two months. The concern over exceptional drought conditions currently lies in the Southern, Lower Valley, and Coastal Bend regions which had less than 50% of expected April precipitation. Despite the dry conditions and a lack of soil moisture, the cotton and corn crops in these regions were reported as doing well.

The El Nino-Southern Oscillation (ENSO) cycle has weakened considerably since February 2009 according to the Climate Prediction Center (CPC). A transition from La Niña to ENSOneutral is underway in the equatorial Pacific Ocean and will continue through the spring. The current one-month forecast from the CPC calls for an equal chance of below normal, near normal, and above normal precipitation across most of the State. The northeastern Panhandle, North Central, and East Central Texas have a 33-40% chance of above normal precipitation. The three-month outlook calls for an equal chance of below normal, near normal precipitation across all of Texas except the far west Trans-Pecos region which has a 33-40% chance of above normal precipitation. Improvement of the current drought is expected across Texas through the end of July, though the improvement will likely be more gradual in Southern Texas and the Lower Valley.

## 3. OVERALL STATEWIDE DROUGHT CONDITIONS

According to drought indices, the State received more relief due to rainfall in April. However, drought conditions worsened in the Trans-Pecos, Southern, and Lower Valley regions.

According to the Palmer Drought Severity Index (PDSI), no region was in an "Extreme Drought" at the end of April. The Southern, South Central, and Trans-Pecos regions were in "Moderate Drought". The Lower Valley, Edwards Plateau, North Central, and Low Rolling Plains regions were under a "Mild Drought' condition, and all other regions were near normal. The PDSI varies from extremely wet, very wet, moderately wet, slightly wet, incipient wet spell, near normal, incipient dry spell, mild drought, moderate drought, severe drought, and extreme drought in order of increasing severity.

According to the Crop Moisture Index (CMI), the Southern and Lower Valley regions were under an "Excessively Dry" condition at the end of April. The Trans-Pecos region was under an "Abnormally Dry" condition. All other regions were either under "Slightly Dry", "Favorably Moist" or "Wet" conditions.

According to the Six-Month Standardized Precipitation Index (SPI), South Central, Southern and Lower Valley regions were under an "Extremely Dry" condition at the end of April. The Upper Coast region was under a "Severely Dry" condition. The Low Rolling Plains, North Central, East, Trans-Pecos, and Edwards Plateau regions were under a "Moderately Dry" condition. The SPI varies in categories of extremely wet conditions, very wet, moderately wet, near normal, moderately dry and, severely dry, extremely dry.

The Keetch-Byram Drought Index (KBDI) indicates an extreme fire danger in the Southern and Lower Valley Regions, a very high fire risk in the Trans-Pecos Region, high in the South Central Region, and above average in the High Plains, Lower Rolling Plains, and Edwards Plateau Regions. The KBDI is a drought index specifically used to describe potential or expected fire behavior. The index is classified as Low, Moderate, High, or Extreme fire danger, in order of increasing severity.

## 4. WATER UTILITY STATUS

May 2009 began with 136 public water systems requiring customers to conserve water by following water use restrictions. Of those systems, 96 asked customers to follow a mandatory watering schedule and 40 asked for voluntary reductions in usage.

The recent rains and cooler temperatures in areas of the State helped keep the demand for outside water use down. The outdoor growing season began which will increase outside water usage. With the increase in usage and the continued lack of significant rain, it is expected more public water systems will reach Drought Contingency Plan triggers and enact watering restrictions.

## 5. WATER RIGHTS – STATEWIDE

Applications for new water use permits and amendments to existing permits remained normal for the month. Beginning April 1 and continuing through the end of August, the Hale Clause and Lake Proctor restrictions are in effect. Owners of these water rights with these restrictions are required to call the "Hale Clause Hotline" on a weekly basis to determine if diversion of water is allowed for permits. The availability of unappropriated water for new water use permits continued to decrease in all river basins in the State, and the search for long-term, dependable alternate sources of water remained a high priority issue.

#### 6. WATER RIGHTS - LOWER RIO GRANDE / RIO GRANDE WATERMASTER (RGWM)

**Current Overall Conditions:** As of April 25, 2009, the U.S. combined ownership at Amistad/Falcon stood at 89.66% of conservation capacity or 3,269,593 acre-feet of new

temporary conservation capacity. Overall, the system is holding 87.41% or 5,563,903 acrefeet of conservation capacity with Amistad at 96.90% or 3,365,257 acre-feet and Falcon at 76.02% or 2,198,646 acre-feet. Mexico has 84.40% or 2,294,309 acre-feet of the water storage at Amistad/Falcon.

**Allocations:** As of printing of the March ownership report printing, all active accounts are currently full. The U.S. allocated 17,867,351 acre-feet to Class A & B water rights which includes irrigation, mining and recreation. Additionally, the U.S. has an amount in excess of 606,043 acre-feet for future 2009 allocations.

**Storage & Loss Amistad vs. Falcon:** The U.S. is currently storing approximately 1.84 million acre-feet or 94.5% at Amistad, and approximately 1.42 million acre-feet or 84.0% at Falcon.

Evaporation and seepage losses at Amistad YTD were 38,251 acre-feet. During April, the U.S. lost 46,859 acre-feet at Falcon.

**Releases to Meet Demands:** Mexico released 42,647 acre-feet from Amistad and 579,972 acre-feet from Falcon for Mexico needs. The U.S. released 225,655 acre-feet from Amistad and 475,564 acre-feet from Falcon for U.S. needs. Combined with gains between Amistad and Falcon, U.S. inflows to Falcon totaled 313,638 acre-feet. So far, the U.S. has met 50% of overall needs in the middle and Lower Rio Grande directly from middle Rio Grande and Amistad inflows this year.

**Upper Rio Grande (New Mexico):** Currently, Elephant Butte in New Mexico is storing 580,467 acre-feet or 28.69%. Caballo Dam, downstream of Elephant Butte, is storing 52,696 acre-feet or 23.21%. This water storage, in part, was used to meet water needs in the El Paso area.

**Outlook:** All active accounts began 2009 with 100% usable balances. The U.S. is operating under temporary conservation until levels return to normal conservation. To help alleviate losses in Falcon, the U.S. monitored ownership and elevation levels in both Falcon and Amistad to more efficiently transfer water from Amistad to Falcon. Deep South Texas experienced no rain during April. According to the United States Drought Monitor, the conditions over Deep South Texas were under a "Severe Drought", while the middle Rio Grande area was under an "Extreme Drought" and portions of the middle to the upper Rio Grande were under "Abnormally Dry" conditions. These conditions will likely result in the persistence or worsening of overall drought conditions along the Rio Grande Basin through Summer 2009.

# 7. SOUTH TEXAS WATERMASTER – GUADALUPE / LAVACA / SAN ANTONIO / NUECES REGION

The South Central area of Texas received scattered showers during April. Showers brought increased flow rates to area rivers but did not provide any long term relief. The U.S. Drought Monitor reflected some slight relief in the Texas Hill Country. However, "Exceptional Drought" continued to spread slowly along the coastal areas.

The Concho River basin did not show much change from the previous month. The rainfall totals in the area were average and flows remained relatively constant during April.

Area Counties: Bandera, Blanco, Comal, Kendall and Kerr Counties

**Rainfall and Area Conditions:** This area received 1.80 to 3.00 inches of rain during April. With that rainfall, the Texas Crop Moisture Index classified this area of the Hill Country as "Mildly Dry". Most of the surface water diversions in this area were for municipal and industrial uses with a few surface water permit holders irrigating hay and sod fields. The U.S. Drought Monitor indicated the area was in "Extreme Drought" conditions.

**Stream Flow Conditions**: Most of the major streams have shown a slight increase in flow during April, and the larger secondary tributaries showed somewhat improved surface flows. However, stream flows of the major streams and their tributaries flowed below their historical mean average.

Site	Ending Flows CFS	Historical Mean CFS
Guadalupe River near Kerrville	98	120
Guadalupe River near Comfort	80	291
Medina River at Bandera	26	136

**Drought Restrictions:** In the Guadalupe River Basin above Canyon Lake, no state permit holders reached their stream flow restrictions. State water right permits and all temporary water right permits in the San Antonio River Basin above Lake Medina are monitored on case by case basis.

**Area Counties:** Bee, Goliad, Victoria, Calhoun, Jackson, Refugio, Aransas, San Patricio, Nueces, Kleberg, Jim Wells, Duval, Live Oak, Kenedy, Willacy, Brooks, and Jim Hogg.

**Rainfall and Area Conditions:** This area received some rainfall during the latter part of April. Some counties in the area received only light showers. The rainfall events did not provide enough moisture to make a significant impact on the ongoing drought. The rainfall did provide some soil moisture and runoff into local area streams, but the stream flows rapidly declined to below average for this time of the year. The U.S. Drought Monitor indicated "Exceptional Drought" conditions extended to counties along the Gulf Coast. Only the southern most counties in the area experienced "Abnormally Dry" conditions, while the counties in the central area of this region experienced "Moderate to Severe Drought" to "Extreme Drought" conditions. Most of the surface water diversions in this area continued to be for municipal and industrial uses, little irrigational use was noted.

## Stream Flow Conditions:

Site (Years of Record)	Beginning Flows CFS	Ending Flows CFS	Last Month CFS	Historical Mean CFS
Guadalupe River near				
Victoria (74)	415	1,700	350	3.240
San Antonio River near				
Goliad (73)	224	857	225	1,120
San Antonio River at				
McFaddin below Goliad (2)	257	292	260	388
Guadalupe River near				
Tivoli (2)	629	2,290	615	2,030
Mission River near Refugio				
(69)	1.7	1.4	2.5	215
Nueces River at Calallen				
Dam (9)	15	25	10	623
Aransas River near				
Skidmore (44)	2.9	3.4	3.4	35

**Corpus Christi Reservoir System:** The Corpus Christi Reservoir System received minimal inflow during April. Choke Canyon is currently at 76.49% of capacity. Lake Corpus Christi is currently at 52.62% of capacity. Corpus Christi continued to divert much of their monthly water supply needs from Lake Texana.

**Drought Restrictions:** No additional drought restrictions of water rights in this area.

**Area Counties:** Atascosa, Karnes, Gonzales, Wilson, McMullen, Dewitt, Guadalupe, Lavaca, Fayette, Colorado, Wharton, and Jackson.

**Rainfall and Area Conditions:** The south and southwestern portions of this area received 0.75 to 1.75 inches of rain during April. The north and northeastern portions received 4.40 to 10.0 inches. Soil moisture conditions improved in the area but need follow up rains to maintain the improved conditions. Grain and hay crops faired well, but with marginal moisture conditions, the improvement may stall. Irrigational activity decreased due to the recent rains. Lake Texana was at 79% of capacity which is 40.21 ft. above mean sea level. This is a 7% increase from last month.

According to the U.S. Drought Monitoring System, this area experienced "Abnormally Dry" to "Exceptional Drought" conditions.

## Stream Flow conditions:

Site	Ending Flows CFS	Last Month CFS	Historical Mean CFS
San Antonio River near Falls City	139	125	314
Cibolo Creek near Falls City	27	24	37
Guadalupe River near Gonzalez	468	520	1,220
Lavaca River at Edna	7.7	81	79
Navidad River near Halletsville	3.3	23	27
Atascosa River near Whitsett	2.6	1.5	12
Frio River near Tilden	4.9	0.9	26
Nueces River near Tilden	0.0	0.0	8.1

**Drought Restrictions:** There were no additional restrictions on diversions.

Area Counties: Edwards, Real, Kinney, Uvalde, Zavala, Dimmit, La Salle and Webb.

**Rainfall and Area Conditions:** The Southwest Texas Area did not receive relief from the drought during April. No rainfall was recorded at the beginning of the month. The northern counties received rain showers mid-month, ending with rainfall in the northern counties and no rainfall in the southern counties. The range of rainfall for the area was 0.10 to 1.50 inches of rain during April. Most of the diversions of surface water were for irrigational use, with small amounts for municipal and industrial uses. Crops irrigated in the area include onions, wheat, haygrazers (a sorghum-sudan crop used for grazing, silage, and hay), and pecans. Soil conditions were poor due to the lack of rainfall. The U.S. Drought Report indicated that this area is experiencing "Severe Drought" to "Exceptional Drought" conditions.

Site	Ending Flows CFS	Last Month CFS	Historical Mean CFS
Nueces River at Laguna	55	66	142
Nueces River at Brackettville	0.00	0.00	12
Nueces River below Uvalde	10	12	71
Frio River at Concan	36	42	140
Sabinal River at Sabinal	0.46	1.4	16
Leona River near Uvalde	7.7	15	40

## Stream Flow Conditions:

Stream flows of intermittent and tributary streams in the area were flowing well below average for this time of year.

**Drought Restrictions:** Currently, the low flow conditions caused several permits with stream flow restrictions to be curtailed, and permits that did not meet their stream flow restrictions were regulated. The Zavala/Dimmit Water District has a rotational diversion schedule on the Nueces River to insure adequate water for domestic and livestock Use. Temporary permits on the Nueces River and Leona River were curtailed.

**Area Counties:** Bastrop, Bexar, Blanco, Caldwell, Comal, Fayette, Frio, Guadalupe, Hays, and Medina.

**Rainfall and Area Conditions:** Moderate widespread rainfall fell across the San Antonio Regional Area during April. Month-to-date rainfall measured at the San Antonio International Airport was 1.37 inches. The average for April is 2.60 inches. The total rainfall to date is 5.16 inches; the normal is 7.73 inches, a decrease of 2.57 inches year to date. On April 28, 2009, the U.S. Drought Monitor indicated the San Antonio Regional Area was experiencing "Extreme" to "Exceptional" drought, impacting crops, pastures, grasslands, stream flows, and reservoir capacities. Ground moisture improved with the recent rainfall, many "dry land" farmers plowed fields and spring planting was well underway. Farmers with supplemental irrigation planted corn, milo, green beans, squash, peas, tomatoes, wheat, and hay grazers.

**Stream Flow Conditions:** The Guadalupe and Blanco Rivers continued to show the impact of the worsening drought. Small creeks dried and most major streams were beginning to quickly pool or dry up entirely. Supplemental surface water irrigation impacted stream flows. Municipal use increased with residential lawn irrigation. Industrial use remained constant.

The Canyon Lake Reservoir was at 896.97 feet elevation, impounding 287,714 acre-feet, and was at 75.9% of capacity. On April 28, 2009, the Edwards Aquifer level at the J17 well in Bexar County was 659.7 feet. The historical average for April is 667.9 feet, which is 8.2 feet below the monthly historical average.

Site	Ending Flows CFS	Historical Mean CFS
Blanco River at Wimberley	22	177
San Marcos River at Luling	84	470
Guadalupe River at Spring Branch	139	386
San Marcos Springs	94	176
Comal Springs	261	302

**Drought Restrictions:** Most Temporary Permits were not allowed to divert surface water. Surface water permits are closely monitored to determine if "real time" stream flows are allowed to divert. Most "junior" water rights will enter additional stream flow restrictions beginning in May.

Area Counties: Sterling, Tom Green, Irion, Concho, Coke, Glasscock, Runnels, Reagan, and Schleicher.

The Concho River Valley received above average amounts of rainfall during April. According to information provided by USDA, the State Drought Monitor Index listed the Concho Valley under "Moderate Drought" to "Severe Drought" conditions.

**Rainfall and Area Conditions:** Rainfall in San Angelo during April was 4.61 inches. Areas surrounding San Angelo received slightly higher rainfall amounts. Average rainfall amount for April is 1.84 inches. Total rainfall for the year is 6.88 inches. In 2007, there was only 0.55 inch of rainfall. The average annual rainfall for San Angelo, based on a 100-year record, is 19 inches. Area reservoirs showed decreases in the amount of storage from the previous month's amounts. The Texas Crop Moisture Index indicated the soil moisture content is "Mildly Dry". Winter wheat was planted and established. Corn was planted and cotton fields were prepared for planting. Demand by appropriated surface water rights in the Concho Valley increased volume due to irrigation of wheat crops and the pre-irrigation of cotton crops.

#### Stream Flow Conditions:

Lake Nasworthy is at 85% of capacity or 8,678 acre-feet. O. C. Fisher was at 5% of capacity or 5,457 acre-feet. Twin Buttes Lake was at 31% of capacity or 57,741 acre-feet.

Site (Years of Record)	Ending Flows CFS	Historical Mean CFS
USGS Gaging System at Spring		
Creek/Twin Buttes (6)	12	13
USGS Gaging System at Concho		
River/San Angelo (78)	3.5	64
USGS Gaging System at South		
Concho/Christoval (73)	8.6	19

**Drought Restrictions:** There were no additional restrictions on diversions in the Concho Valley.

8. UPPER COLORADO (Concho River watershed not included)

The upper Colorado River area received more than normal precipitation during April. The National Weather Service in San Angelo reported monthly precipitation of 4.61 inches, which was 3.01 inches above normal. According to the U.S. Drought Monitor, the drought conditions in the area ranged from "Abnormally Dry" to "Severe". Most tributaries in the upper Colorado watershed had diminished flows; however, there were isolated areas that flowed at or above the USGS long-term median. The pool levels of EV Spence and OH lvie Reservoir decreased during March reaching levels of 9% and 52% of capacity, respectively.

## 9. TEXAS PANHANDLE AND SOUTHERN HIGH PLAINS

**Amarillo Area:** The Amarillo Region reported the following summary for the Northern panhandle area:

Lake Meredith was at 51.65 feet, down 0.5 foot. Lake Greenbelt ended April at 55.12 feet, down 0.02 foot. Lake MacKenzie was at 70.95 feet, up 0.72 feet. The National Weather Service in Amarillo reported a total rainfall during April of 1.84 inches which was 0.31 inch below normal. Total rainfall since January 1, 2009, is 3.33 inches, or 0.31 inch below the year-to-date average.

**Lubbock Area:** Lubbock received 1.51 inches of rain during April. The average rainfall is 1.29 inches. Similar amounts were recorded throughout the area. The average annual rainfall at this point in the year is 3.26 inches. Lubbock recorded 2.74 inches of precipitation thus far. The long term drought situation was not changed. All communities previously noted as being on mandatory water restrictions remained on those restrictions. No new communities were added to the water restrictions list during March and none were removed.

Lubbock and Amherst remained on mandatory drought restriction status. Ralls, Crosbyton, Spur, Post, White River WCS, and Valley WSC in the South Plains area remained on voluntary drought restriction status.

**White River Lake:** The lake's pool elevation was at 2350.54 acre-feet, or 19.4 feet below full, the same level as it was at the end of March 2009. To supply water to its customers, White River WSD has groundwater wells on standby if the lake level drops below usable levels.

**Lake Alan Henry:** The lake is one foot below full. It is not used for public drinking water supplies at present, but will be utilized for this purpose in the near future.

#### **10. WILDLIFE CONCERNS**

No information was received at time of report.

#### **11. AGRICULTURAL CONCERNS**

Widespread rains fell across the Plains, North, North Central, East Texas and the Upper Coast, relieving some of the dry conditions. Rainfall amounts last month in North and East Texas were normal during this time of year. Rainfall in the Upper Coast was significant and greatly diminished existing drought conditions. In most of the areas affected, pasture and range conditions were improved. Rain delayed planting operations in North and East Texas.

The Rio Grande Valley and parts of Central and South Texas remained critically dry with little prospect of normal crop or forage yields. Many crops were zeroed out by insurance adjusters. Farmers considered cover crops to reduce wind erosion in the event rain falls.

**Central:** Rain improved crops and pastures but brought most field work to a standstill. Livestock body condition improved and milk production increased due to a surge in forage growth. Producers slowed supplemental feeding of livestock.

**Coastal Bend:** The northern counties of the region received some rain and saw improvement in forages. Some crops were replanted, but most progressed well. However, southern counties were either left dry or did not get enough rain to alleviate drought conditions. Growing conditions in the southern counties were poor for crops, and the high, dry winds continued to deplete soil moisture. Because standing forage was scarce, livestock producers continued to provide hay and supplemental protein. Producers also continued to sell cattle.

**East:** The region received one to six inches of rain. Growth of warm-season grasses in a few counties was stalled by the high levels of moisture and cool nights. Livestock were in good condition.

**Far West:** A light drizzle was reported in some counties, but not enough to register in rain gauges. Cotton farmers continued to prepare for planting. Chile crops emerged. The first cutting of alfalfa was baled. Fall-planted onions began forming bulbs. The danger of wildfire remained high.

**North:** Soil moisture ranged from adequate to surplus. Flood damaged was caused by three to eight inches of rain. However, the rainfall filled stock tanks and ponds overflowed. New reports indicated the late freezes in early April did more damage to the wheat crop than was first thought. There were reports of 30-80% of wheat damage due to the freeze. However, the warmer weather resulted in excellent crop-growing conditions. Corn and soybean crops looked productive. Cotton was approximately 10 percent planted and sunflowers were approximately 50% planted. Rice was in fair condition. Pastures and hay meadows looked

productive, and producers fertilized meadows and began the first hay harvest. Cool season forages also provided productive growth. Livestock were in fair to good condition due to improved grazing.

**Panhandle:** Soil moisture varied from surplus to very short with most areas reporting short. Corn and peanuts were planted. Wheat varied from good to very poor with most areas reporting poor, with small amounts of freeze damage. Pesticide applicators sprayed for Russian wheat aphids, a pest often associated with dry conditions. Rangeland and pasture conditions varied from good to very poor with most areas reporting poor.

**Rolling Plains:** The region received much-needed moisture, from one to seven inches in most counties. AgriLife Extension in Montague County reported 12 to 17 inches. The heavy rains slowed sorghum planting and lowered the quality of some hay still on the ground. Producers continued to prepare fields for planting of cotton, sorghum and haygrazer. Fertilizers and herbicides were applied. The rain greened up pastures and filled stock tanks. Spring branding began. Producers were baling freeze-damaged wheat as weather permitted.

**South:** Counties in the region received little to no rain. Farmers prepared to harvest wheat and oats. Managing irrigation of corn, sorghum and cotton dominated farmers' schedules. All irrigated crops faired well with little insect pressure. Pastures and rangeland in some counties greened up with past rains, but most were in poor condition. Livestock were in fair condition, due to heavy supplementation. Producers were weaning calves early to prevent a further decline in condition.

**South Plains:** Temperatures were up and down, with highs in the 90s followed by nighttime lows in the 40s. Some counties received rain, but not in significant amounts. Soil moisture was short. Corn, sunflower and peanut planting continued. A few fields were planted to cotton, but most producers were waiting for better growing conditions. Wheat was in very poor to poor condition. Pastures and ranges were in very poor to poor condition. Cattle were in good condition with continued supplemental feeding.

**Southeast:** Heavy rains replenished stock tanks and ground water. Some counties received 4 to 10 inches of rain. Warm temperatures persisted through the evenings, and pastures were in excellent shape. Ryegrass looked "outstanding," and common Bermuda grass started to grow, according to AgriLife Extension county agents. Cool-season annual grasses matured and some fields were cut for hay. Pasture fertilization continued. Reserve hay supplies were short. Livestock were doing well, with supplemental feeding either reduced or halted entirely.

**Southwest:** March and April rains helped green up the region, but the soil profile remained very dry. High winds and near-record afternoon temperatures aggravated drought conditions. Forage was in extremely short supply. Pastures, rangeland and dryland crops made little progress. Ranchers continued to provide heavy supplemental feed to remaining livestock. Potatoes, spring onions, irrigated corn, sorghum and cotton made good progress under heavy irrigation. The wheat harvest was nearly complete, though with disappointing yields.

**West Central:** Most counties received a much needed rain, and soil moisture levels faired well. Days have been warm and humid. Field activities increased. Plowing and planting of summer forages began. Crops showed signs of improvement. Stock-tank levels remained low and in need of more runoff. Range and pasture conditions greened up. Livestock were looking better.

#### **12. WILDFIRE CONCERNS**

The Keetch-Byram Drought Index (KBDI) is used to help determine potential for fire risk. It is a numerical index where each number is an estimate of the amount of precipitation, in 100ths of an inch, needed to bring the soil back to saturation. The index ranges from 0 to 800, with 0 representing a saturated soil, and 800 a completely dry soil. The relationship of the KBDI to fire danger is, as the index increases, the vegetation is subjected to increased moisture stress. KBDI levels and its relationship to expected fire potential are reflected in the following:

**KBDI = 0 – 200**: Soil moisture and large class fuel moistures are high and do not contribute much to fire intensity. This is typical of spring dormant season following winter precipitation.

**KBDI = 201 – 400**: Typical of late spring; early growing season. Lower litter and duff layers are drying and beginning to contribute to fire intensity.

**KBDI = 401 – 600**: Typical of late summer, early fall. Lower litter and duff layers contribute to fire intensity and will burn actively.

**KBDI = 601 – 800**: Often associated with more severe drought and increased wildfire occurrence. Intense, deep-burning fires with significant downwind spotting can be expected. Live fuels can also be expected to burn actively at these levels.

There are currently 102 counties, illustrated in Attachment 2, with KBDI values in excess of 400, indicating areas within these counties are beginning to experience dry conditions which could result in an increased fire risk potential.

The Council, which is chaired by Jack Colley, Chief, Governor's Division of Emergency Management, is composed of state agencies concerned with the effects of drought and fire on the citizens of the State of Texas. The attached information was compiled and provided by representatives listed below. Points of contact, telephone numbers, and web site addresses are also provided.

Jack Colley, Chief, Governor's Division of Emergency Management, (512) 424-2443, fax (512) 424-2444, web site: <u>http://www.txdps.state.tx.us/dem</u>

John Sutton, Texas Water Development Board, (512) 463-7988, fax (512) 463-9893, web site: <u>http://www.twdb.state.tx.us</u>

Chris Loft, Texas Commission on Environmental Quality, (512) 239-4715, fax (512) 239-4770, web site: <u>http://www.tceq.state.tx.us</u>

Richard Egg, Texas State Soil & Water Conservation Board, (254) 773-2250, fax (254) 773-3311, web site: http://www.tsswcb.state.tx.us

Lance Williams, Texas Department of Agriculture, (512) 463-3285, fax (800) 835-2981, web site: <u>http://agr.state.tx.us</u>

Dr. Travis Miller, Texas AgriLife Extension Service, (979) 845-4808, fax (979) 845-0456, web site: <u>http://texasextension.tamu.edu</u>

Cindy Loeffler, Texas Parks & Wildlife Department, (512) 912-7015, fax (512) 707-1358, web site: <u>http://www.tpwd.state.tx.us</u>

Edward T. Morris, Department of Housing and Community Affairs, (512) 475-3329, fax (512) 475-7498, web site: <u>http://www.tdhca.state.tx.us</u>

Carla Baze, Texas Department of Transportation, (512) 416-3270, fax (512)416-2941, web site: <u>http://www.txdot.state.tx.us</u>

Michael Dunivan, Texas Forest Service, (830) 997-5426, web site: <u>http://txforestservice.tamu.edu</u>

Paul Tabor, Texas Department of State Health Services, (512) 801-9816, fax (512) 458-7211, web site: <u>http://www.dshs.state.tx.us/</u>

Thomas Walker, Office of the Governor, Economic Development & Tourism, (512) 936-0169, fax (512) 936-0141, web site: <u>http://www.governor.state.tx.us/divisions/ecodev</u>

David A. Van Dresar, Texas Alliance of Groundwater Districts, (979) 968-3135, fax (979) 968-3194, web site: <u>http://www.texasgroundwater.org/</u>

Dr. John W. Nielsen-Gammon, Office of the State Climatologist, (979) 862-2248, fax (979) 862-4466, web site: <u>http://www.met.tamu.edu/osc/</u>

Gus Garcia, Office of Rural Community Affairs, (512) 936-7876, fax (512) 936-6776, web site: <u>http://www.orca.state.tx.us</u>

CC:

Amy Jeter, Committee Clerk, Senate Finance Committee Sarah Hicks, Committee Director, Senate Finance Committee Teddy Carter, Committee Clerk, Senate Natural Resources Committee Amy Peterson, Committee Clerk, House Appropriations Elizabeth Fazio, Committee Clerk, House Natural Resources Committee Jim Terrell, Committee Clerk, House Agriculture and Livestock Committee Andrew Cates, Committee Clerk, House Criminal Jurisprudence Committee Zak Covar, Policy Advisor for TCEQ Issues, Governor's Policy Office Auburn Mitchell, Policy Advisor for Agriculture/TDA, Governor's Policy Office Rob Johnson, Lt. Governor's Chief of Staff Carmen Cernosek, Lt. Governor's Natural Resources Policy Analyst Shane Linkous, Deputy Division Chief, Intergovernmental Relations, Attorney General's Office Allan B. Polunsky, Chairman, Public Safety Commission C. Tom Clowe, Jr., Member, Public Safety Commission Ada Brown, Member, Public Safety Commission John Steen, Member, Public Safety Commission Carin Marcy Barth, Member, Public Safety Commission Colonel Lamar Beckworth, Interim Director, Department of Public Safety Lori Gabbert, Budget Analyst, Legislative Budget Board (LBB-DPS) Tom Lambert, Budget Analyst, Legislative Budget Board (LBB-TCEQ) Ed Perez, Executive Director, Texas Office of State-Federal Relations, Washington, DC

Brandon Steinmann, Director, Texas Office of State-Federal Relations, Austin, Texas

## Attachment 1 Climatic Regions



Attachment 2 Counties with High to Extreme Fire Danger





DROUGHT PREPAREDNESS COUNCIL

**RICK PERRY** Governor

5805 N. Lamar Blvd.

JACK COLLEY Council Chairman

P.O. Box 4087 Austin, Texas 78773-0220 Phone: (512) 424-2138 Fax: (512) 424-2444 August 13, 2009

TO: The Honorable Rick Perry, Governor, State of Texas

The Honorable David Dewhurst, Lieutenant Governor, State of Texas

Ms. Esperanza Andrade, Secretary of State, State of Texas

The Honorable Robert Duncan, President Pro-Tempore of the Senate, State of Texas

The Honorable Joe Straus, Speaker of the House, State of Texas

The Honorable Steve Ogden, Chairman, Senate Finance Committee, State of Texas The Honorable Kip Averitt, Chairman, Senate Natural Resources Committee, State of Texas The Honorable John Carona, Chairman, Senate Committee on Transportation & Homeland Security, State of Texas

The Honorable Jim Pitts, Chairman, House Appropriations Committee, State of Texas The Honorable Allan Ritter, Chairman, House Natural Resources Committee, State of Texas The Honorable Yvonne Gonzalez-Toureilles, Chairman, House Agriculture & Livestock Committee, State of Texas

The Honorable Pete Gallego, Chairman, House Criminal Jurisprudence Committee, State of Texas

Mr. Ray Sullivan, Chief of Staff, Office of the Governor

Mr. Josh Havens, Texas Governor's Office of Homeland Security

FROM: Chief Jack Colley, Chairman, Drought Preparedness Council

## **SUBJECT:** Statewide Drought Situation Report

Jack Colley, Chairman Texas Division of Emergency Mgmt

Lance Williams, Member Texas Department of Agriculture

Carla Baze, Member Texas Department of Transportation

Chris Loft, Member Texas Commission on Environmental

**Texas Forest Service** 

Quality Michael Dunivan, Member

John Sutton, Member Texas Water Development Board

Dr. Travis Miller, Member **Texas Cooperative Extension** 

David A. Van Dresar, Member **Texas Alliance of Groundwater Districts** 

Thomas Walker, Member Office of the Governor Economic Development & Tourism

Gus Garcia, Member Office of Rural Community Affairs

Richard Egg, Member State Soil & Water Conservation Board

Cindy Loeffler, Member Texas Parks & Wildlife Department

Paul Tabor, Member Texas Department of State Health Services

> Alfonso Royal, Member Texas Department of Housing and **Community Affairs**

Dr. John W. Nielsen-Gammon, Member Office of the State Climatologist

## 1. NEXT COUNCIL MEETING

September 10, 2009, 2:00 p.m., Audit & Inspection Conference Room, Texas Department of Public Safety Headquarters, Building A, 5805 N. Lamar Blvd., Austin, Texas.

## 2. GENERAL CONDITIONS

During July, the long-term drought was entrenched in South Texas, and some regions suffered through the worst drought since precipitation records began back in the 19<sup>th</sup> Century. Comparisons of the current drought to past droughts revealed precipitation deficits are at an all-time high in the Coastal Bend and in the few counties just east of Interstate-35 between Austin and San Antonio. Compounding the situation was that July 2009 was perhaps the hottest month South Texas has ever experienced, setting records for highest temperatures in several cities. However, rainfall was plentiful in the northern half of Texas and most of North Texas, the Panhandle, and West Texas are not experiencing drought conditions.

An upper-level area of high pressure was entrenched over South Texas during most of the month, suppressing most convective thunderstorm activity that normally exists over the region during July. A few weak storm systems were able to make it to the South Central and Upper Coast regions during the last half of the month. This provided temporary relief from the heat and dryness but did little to alleviate the drought situation in these areas. The storm tracks stayed to the north and provided plentiful July rainfall to areas in West Central, North Central, and Northeast Texas. Midland received three times its normal July rainfall, 6.55 inches. According to radar precipitation estimates of the Advanced Hydrologic Predictive Service, the area between Fort Worth and Wichita Falls saw greater than four times the expected July rainfall, as did the region between Tyler and Texarkana.

The persistent high pressure across South Texas made for a sunny, dry, and historically hot July 2009. Several cities set records for the highest average monthly temperature ever recorded. Austin/Mabry, College Station, Corpus Christi, San Antonio, and Victoria set records for highest temperatures ever, including each calendar month. Houston had its third warmest month, while Austin/Bergstrom and Galveston had their sixth warmest months. The excessive warmth increased stress on crops and livestock, and accelerated evaporation of what little soil moisture was left in South Texas. The Keetch-Byrum soil moisture index is getting dangerously close to 800, which represents soil with absolutely no moisture.

In addition to the record heat, the long-term dryness in South Texas is currently breaking records in many South Texas cities. According to data collected since 1872, San Antonio has a normal annual rainfall amount of 55.49 inches. Year-to-date, the City has received 24.38 inches. According to data collected since 1947, Victoria has a normal annual rainfall amount of 73.23 inches. Year-to-date, the City has received 38.26 inches. Both cities experienced their driest 23-month periods ever, and each needs significant August 2009 rainfall to avoid extending the record dryness to two years. Victoria's drought situation was marginally aided by the fact that the nine-month period ending in September 2007 was the wettest on record, 66.20 inches in nine months. According to data collected since 1855, Austin/Mabry has a normal annual rainfall amount of 61.42 inches. During the past 22 months, the area has received 30.49 inches. This is the second driest 22-month period on record. The year-to-date precipitation ending in July at Port Mansfield was only 1.47 inches of precipitation. The normal amount is 11.47 inches. Sarita received only 1.96 inches. The normal amount is 11.72 inches. College Station tied a record by enduring 56 consecutive days without precipitation ending on July 19.

Currently, 16.8% of Texas is categorized as experiencing "Exceptional Drought" conditions, and all of South Texas from the Brazos Valley southward is in either "Extreme" or "Exceptional Drought". Austin, Corpus Christi, Houston, San Antonio, and Victoria implemented either mandatory or voluntary water restrictions in response to the current drought. The San Antonio Water System is in Stage 2 water restrictions with the Edwards

Aquifer below 650 feet, currently at 644 feet, and will implement Stage 3 restrictions for the first time ever should the level drop below 640 feet. Canyon Lake and Medina Lake were at their lowest recorded levels. Lake Travis is approximately 40 feet below normal.

The El Nino-Southern Oscillation officially entered its warm phase and conditions are expected to continue through the Northern Hemisphere winter, according to the Climate Prediction Center (CPC). The current one-month forecast from the CPC calls for a greater than 33% chance of below normal precipitation across most of the State, with the exception of the northeastern Panhandle and Red River Valley. Unfortunately, a greater than 40% chance of below normal August precipitation exists for all but the far western area of the State.

Equal chances exist for below normal, near normal, and above normal three-month precipitation, August–October, for most of the State, with the northwestern Panhandle having a 33-40% chance of above normal precipitation. Continuation and possible deterioration of the drought in extreme South Texas is expected, while South Texas and the Upper Coast may see some improvement over the next three months. This forecast does not account for any tropical cyclone development that could possibly bring significant precipitation to South Texas and improve the drought situation in the region.

## 3. OVERALL STATEWIDE DROUGHT CONDITIONS

According to the Palmer Drought Severity Index (PDSI), the Southern and South Central regions were in an "Extreme Drought" at the end of July. The Edwards Plateau and Lower Valley regions were in a "Severe Drought". The remaining regions were in a "Moderate Drought". The PDSI varies from extremely wet, very wet, moderately wet, slightly wet, incipient wet spell, near normal, incipient dry spell, mild drought, moderate drought, severe drought, and extreme drought in order of increasing severity.

According to the Crop Moisture Index (CMI), the South Central, Upper Coast, Southern, and Lower Valley regions were in an "Extremely Dry" condition. The Edwards Plateau was in an "Abnormally Dry" condition. The North Central and East regions were in a "Mildly Dry" condition. According to the Texas Water Development Board (TWDB) scale, the CMI varies from flooding, standing water, fields too wet, moisture adequate, mildly dry, abnormally dry, excessively dry, severely dry, and extremely dry in order of increasing severity.

According to the Six-Month Standardized Precipitation Index (SPI), the Southern and Lower Valley regions were in an "Extremely Dry" condition. The South Central region was in a "Moderately Dry" condition. The SPI varies in categories of extremely wet conditions, very wet, moderately wet, near normal, moderately dry and, severely dry, extremely dry in order of increasing severity.

The Keetch-Byram Drought Index (KBDI) indicates a very high fire danger in the Upper Coast and Southern regions, an exceptional fire danger in the Lower Valley, and a high fire danger in the remaining regions. The KBDI is a drought index specifically used to describe potential or expected fire behavior. The index is classified as Low, Moderate, High, or Extreme fire danger, in order of increasing severity.

## 4. WATER UTILITY STATUS

August 2009 began with 308 public water systems requiring customers to conserve water by following water use restrictions. The systems included 240 which asked customers to follow

a mandatory watering schedule and 60 asked for voluntary reductions in usage. In addition, eight public water systems relaxed all restrictions to return to normal operation.

The expected increase in usage during the summer months occurred and systems reached the triggers of their Drought Contingency Plans. There is a continued lack of significant rainfall needed to fill lakes and recharge underground aquifers. It is expected this pattern will continue and additional public water systems will reach the triggers of their Drought Contingency Plan and place watering restrictions on customers.

#### 5. WATER RIGHTS – STATEWIDE

New temporary water use permit applications were reviewed on a site-specific basis and issued if there was sufficient surplus water at the requested source. Applications for new water use permits and amendments to existing permits remained normal for the month. Water Rights containing Hale Clause restrictions along the Brazos River, Brazos River Basin were curtailed due to low flows. Owners of water rights with these restrictions were reminded to call the "Hale Clause Hotline" on a weekly basis to determine if diversion of water was allowed for the following week. The availability of unappropriated water for new water use permits continues to decrease in all river basins in the State, and the search for long-term, dependable alternate sources of water remains a high priority issue.

#### 6. WATER RIGHTS – LOWER RIO GRANDE / RIO GRANDE WATERMASTER (RGWM)

**Current Overall Conditions:** As of July 25, 2009, the U.S. combined ownership at Amistad/Falcon stood at 87.24% of conservation capacity or 2,959,092 acre-feet of temporary conservation capacity. Overall, the system is holding 86.24% or 5,108,284 acre-feet of conservation capacity with Amistad at 98.96% or 3,242,029 acre-feet and Falcon at 70.51% or 1,866,254 acre-feet. Mexico has 84.91% or 2,149,192 acre-feet of the water storage at Amistad/Falcon.

**Allocations:** As of the June ownership report printing, all active accounts are currently full. The U.S. allocated 17,867,351 acre-feet to Class A and B water rights for irrigation, mining, and recreation. Additionally, the U.S. has an amount in excess of 680,946 acre-feet for future 2009 allocations.

**Storage & Loss Amistad vs. Falcon:** The U.S. is currently storing approximately 1.84 million acre-feet or 98.3% at Amistad, and approximately 1.15 million acre-feet or 74.1% at Falcon.

Evaporation and seepage losses at Amistad YTD were 127,026 acre-feet. For the same period, 159,126 acre-feet have been lost at Falcon. Amistad is currently 79.8% more efficient in overall storage and loss as compared to total amount in storage.

**Releases to Meet Demands:** Mexico released 286,833 acre-feet from Amistad and 832,445 acre-feet from Falcon for Mexico needs. The U.S. released 910,879 acre-feet from Amistad and 504,559 acre-feet from Falcon for U.S. needs. Combined with gains between Amistad and Falcon, U.S. inflows to Falcon totaled 586,167 acre-feet. So far, the U.S. met 64% of overall needs in the middle and Lower Rio Grande directly from middle Rio Grande and Amistad inflows this year.

**Upper Rio Grande (New Mexico):** Currently, Elephant Butte in New Mexico is storing 531,014 acre-feet or 26.24% of capacity. Caballo Dam, downstream of Elephant Butte, is

storing 54,317 acre-feet or 23.93% of capacity. This water storage, in part, was used to meet water needs in the El Paso area.

**Outlook:** All active accounts began 2009 with 100% usable balances. To help alleviate losses in Falcon, the U.S. will continue to monitor ownership and elevations levels in both Falcon and Amistad so that U.S. transfers of water from Amistad to Falcon can be most efficient.

# 7. SOUTH TEXAS WATERMASTER – GUADALUPE / LAVACA / SAN ANTONIO / NUECES REGION

Area Counties: Bandera, Blanco, Comal, Kendall and Kerr Counties

**Rainfall and Area Conditions:** The area received widely scattered rain from 1.0 to 4.0 inches during July. With that rainfall, the Texas Crop Moisture Index classified the area of the Hill Country as "Extremely Dry" to "Severely Dry". Most of the surface water diversions in the area were for municipal and industrial uses with a few surface water permit holders irrigating hay and sod fields. The U.S. Drought Monitor indicates the area is in an "Exceptional Drought" condition.

**Stream Flow Conditions**: Stream flows of the major streams and their tributaries flowed below average. With the scattered rains the Guadalupe River showed a slight increase in flow for the month of July, while the Medina and the Sabinal Rivers have stopped surface flow in some sections. Most of the larger secondary tributaries still show no surface flows.

Site	Ending Flows CFS	Historical Mean CFS
Guadalupe River near Kerrville	59	96
Guadalupe River near Comfort	37	1170
Medina River at Bandera	0.30	98

**Drought Restrictions:** In the Guadalupe River Basin above Canyon Lake, no state permit holders reached their stream flow restrictions. State water right permits and all temporary water right permits in the San Antonio River Basin above Lake Medina are monitored on a case by case basis.

**Area Counties:** Bee, Goliad, Victoria, Calhoun, Jackson, Refugio, Aransas, San Patricio, Nueces, Kleberg, Jim Wells, Duval, Live Oak, Kenedy, Willacy, Brooks, and Jim Hogg.

**Rainfall and Area Conditions:** The area received only scattered to isolated rain showers throughout the month. The light and scattered showers provided no relief to the continued drought conditions. Stream flows rose for a short time period, but quickly diminished and continue to decline. Most of the area streams flowed below what is expected for this time of the year. It was reported that area crops continued to perish due to the extended drought conditions. The U.S. Drought Monitor indicated that "Exceptional Drought" conditions continue to expand throughout the counties in South and Central Texas. Most surface water diversions in this area continued to be for municipal and industrial uses, with little irrigational use.

## Stream Flow Conditions:

Site (Years of Record)	Beginning Flows CFS	Ending Flows CFS	Last Month CFS	Historical Mean CFS
Guadalupe River near				
Victoria (74)	200	149	220	1,400
San Antonio River near				
Goliad (73)	140	108	94	604
San Antonio River at				
McFaddin below Goliad (2)	150	131	181	5,140
Guadalupe River near				
Tivoli (2)	500	438	392	1,630
Mission River near Refugio				
(69)	0.40	0.0	0.41	33
Nueces River at Calallen				
Dam (9)	0	11	0	3,100
Aransas River near				
Skidmore (44)	1.6	1.3	1.6	6.1

The "saltwater barrier" on the Guadalupe River, near Tivoli, Texas, was activated several times during July. The "saltwater barrier" is activated or engaged to prevent the intrusion of saltwater and the subsequent contamination of "fresh water" when low stream flows occur.

**Corpus Christi Reservoir System:** The Corpus Christi Reservoir System received minimal inflows during July and the level of the reservoir system continued to drop. The Corpus Christi Reservoir System was at 61.6% of capacity, or 586,685 acre-feet, compared to 87.3% of capacity, or 832,016 acre-feet, during the same time last year. The level of Choke Canyon dropped to 71.1% of capacity, or 494,137 acre-feet, compared to 89.7% of capacity, 623,531 acre-feet, during the same time last year. Lake Corpus Christi was at 36% of capacity, or 92,548 acre-feet, compared to 81% of capacity, or 208,485 acre-feet, last year. Corpus Christi continued to divert much of its monthly water supply needs from Lake Texana.

**Drought Restrictions:** Some stream flow restrictions of water rights in the area were reached. Stream flow restrictions for the City of Victoria's water rights were reached. The City is currently allowed to exchange ground water, from city wells, from the Guadalupe River.

Area Counties: Edwards, Real, Kinney, Uvalde, Zavala, Dimmit, La Salle and Webb.

**Rainfall and Area Conditions:** The Southwest Texas Regional Area received minimal amounts of rainfall during July, with no rain reported during the middle of the month. The month ended with heavy showers in the northern counties and light showers in the southern counties. The range of rainfall in the area was 0.10 to 2.00 inches during July. Most of the diversions of surface water were for irrigational use and small amounts for municipal and industrial uses. Crops irrigated in the area include cotton, maze, hay grazers, and pecans. Soil conditions are poor due to the lack of rain fall. The U.S. Drought Report indicates that this area is experiencing "Severe Drought" to "Exceptional Drought" conditions at this time.

## Stream Flow Conditions:

Site	Ending Flows CFS	Last Month CFS	Historical Mean CFS
Nueces River at Laguna	32	15	114
Nueces River at Brackettville	0.00	0.00	22
Nueces River below Uvalde	4.3	3.8	105
Frio River at Concan	5.4	13	100
Sabinal River at Sabinal	0.05	0.10	27
Leona River near Uvalde	0.0	0.0	40

Stream flows of intermittent and tributary streams in the area were flowing well below average for this time of year.

**Drought Restrictions:** Currently, the low flow conditions caused several permits with stream flow restrictions to be curtailed, and permits that did not meet their stream flow restrictions were regulated. The Zavala/Dimmit Water District has a rotational diversion schedule for the Nueces River to ensure adequate water for domestic and livestock use. All temporary permits in the Southwest Texas Regional area were shut off.

**Area Counties:** Bastrop, Bexar, Blanco, Caldwell, Comal, Fayette, Frio, Guadalupe, Hays, and Medina.

**Rainfall and Area Conditions:** Only a trace of rain fell across the San Antonio Regional Area during July. Rainfall measured at the San Antonio International Airport was 0.81 inch. The average precipitation for July is 2.03 inches. The total rainfall to date for 2009 is 7.95 inches, 11 inches below the normal year to date rainfall of 18.95 inches. The U.S. Drought Monitor dated July 28, 2009 indicated the San Antonio Regional Area was experiencing "Exceptional Drought", impacting crops, pastures, grasslands, stream flows, and reservoir capacities. Ground moisture rapidly diminished with above average temperatures, high winds, the lack of cloud cover, and no rain. With supplemental irrigation, good harvests of hay grazers, blackberries, sweet corn, yellow and white squash, zucchini, cucumbers, tomatoes, white onions, watermelons, antelopes, and garlic were reported. Most "dry land" crops were lost or dramatically stunted due to either the ensuing drought or the lack of rainfall.

**Stream Flow Conditions:** The Guadalupe and Blanco Rivers continued to reflect the impact of the worsening drought. Small creeks dried and most major streams began to quickly pool or dry up entirely. Supplemental surface water irrigation impacted stream flows. Municipal use increased with residential lawn irrigation. Industrial use remained constant.

The Canyon Lake Reservoir was at 894.33 feet elevation, impounding 270,383 acre-feet, or 71.38% of capacity. On July 31, 2009, the Edwards Aquifer level at the J17 well in Bexar County was 643.6 feet. The historical average for July is 661.1 feet, which is 17.5 feet below the monthly historical average.

Site	Ending Flows CFS	Historical Mean CFS
Blanco River at Wimberley	9.4	438
San Marcos River at Luling	79	355
Guadalupe River at Spring Branch	4.6	140
San Marcos Springs	86	187
Comal Springs	161	278

**Drought Restrictions:** Most Temporary Permits were not allowed to divert surface water. Surface water permits are closely monitored to determine if "real time" stream flows are allowed to divert. Surface water permits with stream flow restrictions were triggered and curtailed.

Area Counties: Sterling, Tom Green, Irion, Concho, Coke, Glasscock, Runnels, Reagan, and Schleicher.

The Concho River Valley received above average amounts of rainfall during July. According to information provided by USDA, the State Drought Monitor listed the Concho Valley in an "Abnormally Dry" condition.

**Rainfall and Area Conditions:** Rainfall in San Angelo during July was 4.35 inches. Areas surrounding San Angelo received slightly higher rainfall amounts. The average rainfall amount for July is 1.69 inches. Total rainfall for the year is 12.11 inches. The average annual rainfall for San Angelo, based on a 100-year record, is 19 inches. There were nine days with over one hundred-degree temperatures. Area reservoirs showed continued decreases in the amount of storage capacities from the previous month. The Texas Crop Moisture Index indicated the soil moisture content is "Severely Dry". Corn and sorghum were planted and established. Cotton fields were planted. There was an increased demand by appropriated surface water rights in the Concho Valley due to the irrigation of cotton, corn, and sorghum crops.

Site (Years of Record)	Ending Flows CFS	Historical Mean CFS
USGS Gaging System at Spring		
Creek/Twin Buttes (6)	34	4.8
USGS Gaging System at Concho		
River/San Angelo (78)	13	11
USGS Gaging System at South		
Concho/Christoval (76)	6.9	14

## **Stream Flow Conditions:**

Lake Nasworthy was at 84% of capacity or 8,567 acre-feet. O.C. Fisher was at 4% of capacity or 4,707 acre-feet. Twin Buttes Lake was at 25% of capacity or 45,743 acre-feet.

**Drought Restrictions:** Most Temporary Permits were not allowed to divert surface water. Surface water permits were closely monitored. Restrictions on diversions were triggered in the Concho Valley based on "real time" stream flows. The few diversions that were allowed in the area were based on availability in that specific segment. If inflows remain at current levels, without any increases; all diversions in the area will be suspended until such time as the inflow levels return to normal.

#### 8. UPPER COLORADO (Concho River watershed not included)

The upper Colorado River area received less than normal precipitation during July. The National Weather Service in San Angelo reported monthly precipitation of 4.64 inches, which was 3.54 inches above normal. According to the U.S. Drought Monitor, the drought conditions in the area ranged from "Abnormally Dry" to "Moderate Drought". Most tributaries in the upper Colorado watershed had diminished flows. However, there were isolated areas that flowed at or above the USGS long-term median. The pool levels of EV Spence and OH lvie Reservoir decreased during May reaching levels of 7% and 48% of capacity, respectively.

## 9. TEXAS PANHANDLE AND SOUTHERN HIGH PLAINS

**Amarillo Area:** The Amarillo Region reported the following summary for the Northern panhandle area:

Lake Meredith ended the month at 48.15 feet. Lake Greenbelt ended July at 54.32 feet. Lake MacKenzie ended the month at 72.24. The National Weather Service in Amarillo reported a total rainfall during July of 3.78 inches. Total rainfall since January 1, 2009, is 10.33 inches, or 1.77 inches below the year-to-date average.

**Lubbock Area:** Lubbock received 1.69 inches of rain during July. The average rainfall is 2.13 inches. Similar amounts were recorded throughout the area. Since the beginning of the year, Lubbock has received a total of 7.55 inches of precipitation. This is 3.13 inches below the normal of 10.68 inches for July. The long term drought situation was not changed. All communities previously noted as being on mandatory water restrictions remained on those restrictions. No new communities were added to the water restrictions list during July and none were removed.

Lubbock and Amherst remained on mandatory drought restriction status. Ralls, Crosbyton, Spur, Post, White River WCS, and Valley WSC in the South Plains area remained on voluntary drought restriction status.

**White River Lake:** The lake pool elevation was at 2349 acre-feet, or 21.0 feet below full. This is one foot lower than the level at the end of May 2009. White River WSD has groundwater wells on standby if the lake level drops below usable levels.

**Lake Alan Henry:** The lake is 1.5 foot below full. It is not used for public drinking water supplies at present, but will be utilized for this purpose in the near future.

#### **10. WILDLIFE CONCERNS**

No information was received at time of report.

#### **11. AGRICULTURAL CONCERNS**

Welcome rains improved agricultural conditions over most of the High and Rolling Plains, the Trans Pecos, West Central Texas, North and East Texas regions. Dryland crops across

the plains improved. The plains cotton crop varied greatly in age due to problems at planting time, but the majority of the crop was in fair to good condition. Rains were also timely for much of the dryland sorghum crop. Irrigated crop conditions mostly good as temperatures cooled a bit. Crops, pastures and rangeland continued to decline across much of Central, South and Southwest Texas, the Lower Valley and the Gulf Coast and high temperatures and dry conditions continued. Livestock water in Central and South Texas and the Gulf Coast rapidly dried up. Hay was scarce and expensive and livestock auctions ran large numbers of cattle from herds being severely culled or liquidated due to lack of water, grazing and affordable hay or feed supplies.

The following comments regarding agricultural conditions across the State over the last week are from AgriLife Extension reporters.

**Central:** Most of the region received rain and cooler temperatures in the last week of July. However, the rains were not enough to fill stock tanks or creeks. Bushel weights in corn were low and aflatoxin was found in many samples of harvest corn. Overall, the corn crop was poor, with low or no yields except in irrigated fields. Lack of forages for grazing was still a concern for livestock producers.

**Coastal Bend:** The region experienced above-normal temperatures and no rain. The drought continued to take its toll. Rangeland and pastures will need several years to come back to quality grazing potential. Row crops were near complete failure. Low grain yields were reported coming into elevators. Farmers and ranchers had a poor outlook, and the agribusiness infrastructure, such as grain facilities, harvesting and trucking companies suffered. Sale of cattle and other livestock continued due to lack of forage, water, and the scarcity and high price of hay.

**East:** As much as 10 inches of rain was reported in some parts of the region, but most received approximately two inches. Flooding was an issue in some counties. Some burn bans were lifted and another cutting of hay is possible. This is critical as most east Texas farmers have harvested only one cutting. There were reports of grasshoppers and armyworms. Livestock were in fair to good condition.

**Far West:** The region received one to five inches of rain. Cotton faired well, though in some fields there were reports of bacterial blight, stink bugs and grasshoppers. Pastures looked productive after the rains.

**North:** Soil moisture ranged from adequate to surplus. Some areas received eight to 16 inches of rain. The pastures and hay fields greatly improved, encouraging producers. Corn and grain sorghum were in fair to good condition and mostly matured, so the rains were not much benefit. The same held true for soybeans. The corn harvest was under way; some producers harvested the crop for silage. Hay was still being sent to South Central Texas. Cotton was in fair condition and should also respond. The rain replenished most stock tanks. Sunflowers proved to be profitable this year with yields of 1,200 pounds and higher per acre. Cattle were in good condition. Rangeland and pastures were in fair to good shape. Drought damaged corn is expected to have increased mycotoxin problems due to rain after harvest maturity.

**Panhandle:** The region saw widespread showers and lower temperatures, with 0.5 to three inches reported across southern and western counties. However, the northeast corner of the region remained very dry. Corn, cotton, peanuts, and soybeans were in good condition. Sorghum was fair. Cotton needed more heat units. Corn in the northeast was only 50%

pollinated. Wheat fields were prepared for planting. Rain helped dryland crops. Insect counts were low for this time of year, but southwestern corn borer numbers were on the rise. Cattle on grass were doing well, and cattle in feed yards did better thanks to the lower temperatures. The rangelands showed some improvement.

**Rolling Plains:** From one to six inches of rain helped tremendously in improving pastures and hay fields. It appeared another cutting of hay could be made. Some runoff was collected in parts of the district. Livestock were in fair to good condition. Cotton made beneficial progress in some areas while in other counties farmers have plowed under this year's crop due to poor stands. Moisture will be beneficial as farmers prepare for wheat planting.

**South:** Continued hot, dry weather meant soil moisture was very short throughout the region. All farmers, even those irrigating, experienced problems keeping up with evaporative demand because of extremely high temperatures. Even trees began to show signs of drought stress and dying. Corn and sorghum harvests were expected to be completed soon. Cotton continued to develop, and most peanuts were pegging. In the eastern parts of the region, sesame as an alternative crop was flowering and setting pods. It was the only crop doing well in that area. Producers continued to move livestock out of the eastern counties or supply heavy supplemental feeding. In some cases, producers totally sold herds. No field preparation for fall crops was reported. In the southern parts of the region, the sorghum and corn harvests were complete, cotton harvesting was beginning, and sugarcane planting was under way.

**South Plains:** The region experienced slightly cooler temperatures and some much needed rain. Some hail damage was reported in Hale, Cochran, and Bailey counties. Producers continued herbicide applications, irrigating most crops. Cotton bloomed and was mostly in fair to good condition. Sorghum headed out and was in fair to good condition. The rain was expected to improve pastures. Producers continued supplemental feeding of livestock.

**Southeast:** Due to recent rains, the range conditions dramatically improved in parts of the region. The rain made possible a second or third cutting of hay for most hay producers in Madison County. However, extreme heat and no rain made conditions severe in Grimes and other counties. Burn bans remained in effect.

**Southwest:** July was the hottest month on record for some stations, 23 days with temperatures of 100 degrees or above. The average high temperature for the month at Uvalde was 100.4. In addition, the last 11 month period was the second-driest period on record. There was some relief, however, as light sporadic showers deposited 0.5 to one inch of rain in the southern most part of the region. The light rain was not significant to agricultural conditions due to high temperatures and dry conditions. Incidences of roadside and field wildfires fires continued. Forage availability was almost non-existent. The corn and sorghum harvests were nearly complete with below-average yields reported. Cotton, peanuts and pecans made excellent progress under heavy irrigation.

**West Central:** Temperatures were milder with recent weather changes. Many counties reported significant rainfall, raising soil moisture levels. Crops tried to recover from drought conditions. Improved soil moisture will help fall planting get off to a good start. Rangeland and pastures improved due to the rain. Pecans were in fair to good condition.

#### **12. WILDFIRE CONCERNS**

The Keetch-Byram Drought Index (KBDI) is used to help determine potential for fire risk. It is a numerical index where each number is an estimate of the amount of precipitation, in 100ths of an inch, needed to bring the soil back to saturation. The index ranges from 0 to 800, with 0 representing a saturated soil, and 800 a completely dry soil. The relationship of the KBDI to fire danger is, as the index increases, the vegetation is subjected to increased moisture stress. KBDI levels and its relationship to expected fire potential are reflected in the following:

**KBDI = 0 – 200**: Soil moisture and large class fuel moistures are high and do not contribute much to fire intensity. This is typical of spring dormant season following winter precipitation.

**KBDI = 201 – 400**: Typical of late spring; early growing season. Lower litter and duff layers are drying and beginning to contribute to fire intensity.

**KBDI = 401 – 600**: Typical of late summer, early fall. Lower litter and duff layers contribute to fire intensity and will burn actively.

**KBDI = 601 – 800**: Often associated with more severe drought and increased wildfire occurrence. Intense, deep-burning fires with significant downwind spotting can be expected. Live fuels can also be expected to burn actively at these levels.

There are currently 163 counties, illustrated in Attachment 2, with KBDI values in excess of 400, indicating areas within these counties are beginning to experience dry conditions which could result in an increased fire risk potential.

The Council, which is chaired by Jack Colley, Chief, Governor's Division of Emergency Management, is composed of state agencies concerned with the effects of drought and fire on the citizens of the State of Texas. The attached information was compiled and provided by representatives listed below. Points of contact, telephone numbers, and web site addresses are also provided.

Jack Colley, Assistant Director, Texas Division of Emergency Management, (512) 424-2443, fax (512) 424-2444, web site: <u>http://www.txdps.state.tx.us/dem</u>

John Sutton, Texas Water Development Board, (512) 463-7988, fax (512) 463-9893, web site: <u>http://www.twdb.state.tx.us</u>

Chris Loft, Texas Commission on Environmental Quality, (512) 239-4715, fax (512) 239-4770, web site: <u>http://www.tceq.state.tx.us</u>

Richard Egg, Texas State Soil & Water Conservation Board, (254) 773-2250, fax (254) 773-3311, web site: http://www.tsswcb.state.tx.us

Lance Williams, Texas Department of Agriculture, (512) 463-3285, fax (800) 835-2981, web site: <u>http://agr.state.tx.us</u>

Dr. Travis Miller, Texas AgriLife Extension Service, (979) 845-4808, fax (979) 845-0456, web site: <u>http://texasextension.tamu.edu</u>

Cindy Loeffler, Texas Parks & Wildlife Department, (512) 912-7015, fax (512) 707-1358, web site: <u>http://www.tpwd.state.tx.us</u>

Alfonso Royal, Department of Housing and Community Affairs, (512) 475-3329, fax (512) 475-7498, web site: <u>http://www.tdhca.state.tx.us</u>

Carla Baze, Texas Department of Transportation, (512) 416-3270, fax (512)416-2941, web site: <u>http://www.txdot.state.tx.us</u>

Michael Dunivan, Texas Forest Service, (830) 997-5426, web site: <u>http://txforestservice.tamu.edu</u>

Paul Tabor, Texas Department of State Health Services, (512) 801-9816, fax (512) 458-7211, web site: <u>http://www.dshs.state.tx.us/</u>

Thomas Walker, Office of the Governor, Economic Development & Tourism, (512) 936-0169, fax (512) 936-0141, web site: <u>http://www.governor.state.tx.us/divisions/ecodev</u>

David A. Van Dresar, Texas Alliance of Groundwater Districts, (979) 968-3135, fax (979) 968-3194, web site: <u>http://www.texasgroundwater.org/</u>

Dr. John W. Nielsen-Gammon, Office of the State Climatologist, (979) 862-2248, fax (979) 862-4466, web site: <u>http://www.met.tamu.edu/osc/</u>

Gus Garcia, Office of Rural Community Affairs, (512) 936-7876, fax (512) 936-6776, web site: <u>http://www.orca.state.tx.us</u>
CC:

Amy Jeter, Committee Clerk, Senate Finance Committee Sarah Hicks, Committee Director, Senate Finance Committee Teddy Carter, Committee Clerk, Senate Natural Resources Committee Amy Peterson, Committee Clerk, House Appropriations Elizabeth Fazio, Committee Clerk, House Natural Resources Committee Jim Terrell, Committee Clerk, House Agriculture and Livestock Committee Andrew Cates, Committee Clerk, House Criminal Jurisprudence Committee Zak Covar, Policy Advisor for TCEQ Issues, Governor's Policy Office Auburn Mitchell, Policy Advisor for Agriculture/TDA, Governor's Policy Office Carmen Cernosek, Lt. Governor's Natural Resources Policy Analyst Shane Linkous, Deputy Division Chief, Intergovernmental Relations, Attorney General's Office Allan B. Polunsky, Chairman, Public Safety Commission C. Tom Clowe, Jr., Member, Public Safety Commission Ada Brown, Member, Public Safety Commission John Steen, Member, Public Safety Commission Carin Marcy Barth, Member, Public Safety Commission Colonel Steven McCraw, Director, Department of Public Safety Lt. Colonel Lamar Beckworth, Deputy Director, Department of Public Safety Lori Gabbert, Budget Analyst, Legislative Budget Board (LBB-DPS)

Tom Lambert, Budget Analyst, Legislative Budget Board (LBB-TCEQ) Ed Perez, Executive Director, Texas Office of State-Federal Relations, Washington, DC

Brandon Steinmann, Director, Texas Office of State-Federal Relations, Austin, Texas



# Attachment 2 Counties with High to Extreme Fire Danger





**DROUGHT PREPAREDNESS COUNCIL** 

RICK PERRY Governor 5805 N. Lamar Blvd. P.O. Box 4087 Austin, Texas 78773-0220 Phone: (512) 424-2138 Fax: (512) 424-2444 October 8, 2009 JACK COLLEY Council Chairman

TO: The Honorable Rick Perry, Governor, State of Texas

The Honorable David Dewhurst, Lieutenant Governor, State of Texas

Ms. Esperanza Andrade, Secretary of State, State of Texas

The Honorable Robert Duncan, President Pro-Tempore of the Senate, State of Texas

The Honorable Joe Straus, Speaker of the House, State of Texas

The Honorable Steve Ogden, Chairman, Senate Finance Committee, State of Texas The Honorable Kip Averitt, Chairman, Senate Natural Resources Committee, State of Texas The Honorable John Carona, Chairman, Senate Committee on Transportation & Homeland Security, State of Texas

The Honorable Jim Pitts, Chairman, House Appropriations Committee, State of Texas The Honorable Allan Ritter, Chairman, House Natural Resources Committee, State of Texas The Honorable Yvonne Gonzalez-Toureilles, Chairman, House Agriculture & Livestock Committee, State of Texas

The Honorable Pete Gallego, Chairman, House Criminal Jurisprudence Committee, State of Texas

Mr. Ray Sullivan, Chief of Staff, Office of the Governor

Mr. Josh Havens, Texas Governor's Office of Homeland Security

FROM: Chief Jack Colley, Chairman, Drought Preparedness Council

# SUBJECT: Statewide Drought Situation Report

Jack Colley, Chairman Texas Division of Emergency Mgmt

Lance Williams, Member Texas Department of Agriculture

Carla Baze, Member Texas Department of Transportation

Chris Loft, Member Texas Commission on Environmental

Quality Michael Dunivan, Member

**Texas Forest Service** 

John Sutton, Member Texas Water Development Board

Dr. Travis Miller, Member Texas Cooperative Extension

David A. Van Dresar, Member Texas Alliance of Groundwater Districts

Thomas Walker, Member Office of the Governor Economic Development & Tourism

Gus Garcia, Member Texas Department of Rural Affairs Richard Egg, Member State Soil & Water Conservation Board

Cindy Loeffler, Member Texas Parks & Wildlife Department

Paul Tabor, Member Texas Department of State Health Services

> Vacant, Member Texas Department of Housing and Community Affairs

Dr. John W. Nielsen-Gammon, Member Office of the State Climatologist

# 1. NEXT COUNCIL MEETING

November 12, 2009, 2:00 p.m., Audit & Inspection Conference Room, Texas Department of Public Safety Headquarters, Building A, 5805 N. Lamar Blvd., Austin, Texas.

# 2. GENERAL CONDITIONS

September 2009 was wetter than normal for the majority of drought-stricken South Texas, which provided some much needed short-term relief to the region. However, a significant area of the Gulf Coast from Matagorda County to Kleberg County remained drier than normal during the month. Currently, "Exceptional Drought" covers most of the Coastal Bend and an area in Bastrop, Caldwell, and Guadalupe counties of Central Texas. Even in areas of South Texas receiving above normal September precipitation, significant long-term precipitation deficits remain. Several wet months are needed to fully eradicate the drought.

The most prominent weather feature during September was an upper level low that brought persistent rains during the middle of the month. Widespread significant rain fell in the core drought areas of South Central Texas from September 10-12. Rainfall brought by the low area persisted in North Central and Northeast Texas for more than a week, falling on top of ground already saturated from summer rainfall. Storm systems left the western half of Texas unaffected, with most of the Panhandle and Trans-Pecos regions receiving less than one inch of rainfall.

Widespread heavy rainfall fell on September 22 in South Central Texas, with San Antonio picking up over one inch and Austin/Mabry over two inches of precipitation. For the month, San Antonio was three inches above normal with 6.35 inches of rainfall. Rainfall at Austin/Mabry and Austin Bergstrom was approximately seven inches during September. Overall, September rainfall was five to eight inches in the region of "Severe" to "Exceptional" drought in South Central Texas.

According to the Advance Hydrologic Predictive Service, The Lower Valley showed improvement in the drought situation with a monthly rainfall total of five to ten inches. Brownsville received 9.43 inches of precipitation during September, leading to the elimination of drought conditions by September 29. Victoria and Corpus Christi received above normal precipitation during September. Victoria ended the month with 6.44 inches and Corpus Christi ended with 6.27 inches. Other than Corpus Christi, other Coastal Bend areas east of Highway 77 received less than three inches of precipitation.

September rainfall had a much greater benefit on agriculture and soil moisture than reservoirs and hydrologic conditions. Surface soil moisture was enough to significantly lower the fire danger in South Texas. The increased surface moisture led to the removal of burn bans in several counties. Medina and Canyon Lakes reported new record low levels and Lake Travis remained at its third lowest level on record. Victoria saw enough improvement in reservoir levels to drop Stage 2 watering restrictions. However, the Edwards Aquifer remained low, causing San Antonio to remain in Stage 2 restrictions, while Kerrville continued Stage 3 restrictions.

The El Nino-Southern Oscillation is in the warm phase and these conditions are expected to strengthen through the Northern Hemisphere during winter, according to the Climate Prediction Center (CPC). The current one-month forecast calls for a greater than 50% chance of above normal October precipitation across the majority of East Texas and the Upper Coast, a 40-50% chance of above normal precipitation for a region stretching from North Central Texas through the Lower Valley, and a 33-40% chance of above normal precipitation in the Low Rolling Plains and Edwards Plateau.

The three-month outlook for October through December has a 40-50% chance of above normal precipitation from the Upper Coast to the Lower Valley, which includes all areas of Texas currently in exceptional drought. Except for the Panhandle and Trans Pecos regions,

the rest of the State has a 33-40% chance of above normal precipitation for the remainder of 2009. The drought situation is expected to improve by the end of autumn in all areas of Texas currently experiencing drought conditions.

# 3. OVERALL STATEWIDE DROUGHT CONDITIONS

The cooler air and rain swept drought away in the majority of the regions. For the regions still in drought, the severity was reduced.

According to the Palmer Drought Severity Index (PDSI), the South Central region was in a "Moderate Drought" condition, and the Southern and Upper Coast regions were in "Mild Drought" conditions. The remaining regions were reported to not show drought conditions.

According to the Crop Moisture Index (CMI), all regions except for the North Central were under a "Mildly Dry" condition. According to the Texas Water Development Board (TWDB) scale, the CMI varies from flooding, standing water, fields too wet, moisture adequate, mildly dry, abnormally dry, excessively dry, severely dry, and extremely dry in order of increasing severity.

According to the Six-Month Standardized Precipitation Index (SPI), the Southern and Lower Valley regions were in "Extremely Dry" conditions. The South Central region was in a "Moderately Dry" condition. The remaining regions were in a "Near Normal" condition. The SPI varies from extremely wet conditions, very wet, moderately wet, near normal, moderately dry and, severely dry, extremely dry in order of increasing severity.

# 4. WATER UTILITY STATUS

October 2009 began with 342 public water systems requiring customers to conserve water by following water use restrictions. Mandatory watering schedules were imposed by 274 water systems and 55 asked for voluntary reductions in usage. In addition, 13 public water systems were able to relax all restrictions and return to normal operation. Recent rains continued to help by reducing water demand and increasing ground water and surface supplies in some areas of the State.

If rainfall continues as forecasts predict, additional public water systems will be able to relax or remove watering restrictions.

# 5. WATER RIGHTS – STATEWIDE

New temporary water use permit applications were reviewed on a site-specific basis and issued if there was sufficient surplus water at the requested source. Applications for new water use permits and amendments to existing permits remained normal for the month. Water Rights containing Hale Clause restrictions along the Brazos River and the Brazos River Basin were curtailed due to low flows. Owners of water rights with these restrictions were reminded to call the "Hale Clause Hotline" on a weekly basis to determine if diversion of water was allowed for the following week. The availability of unapproprieted water for new water use permits continues to decrease in all river basins in the State, and the search for long-term, dependable alternate sources of water remains a high priority issue.

# 6. WATER RIGHTS - LOWER RIO GRANDE / RIO GRANDE WATERMASTER (RGWM)

**Current Overall Conditions:** As of September 26, 2009, the U.S. combined ownership at Amistad/Falcon stood at 80.78% of conservation capacity or 2,740,200 acre-feet of

temporary conservation capacity. Overall, the system is holding 101.24% or 3,434,168 acrefeet of conservation capacity with Amistad at 81.74% or 4,841,560 acre-feet and Falcon at 95.5% or 3,128,530 acre-feet. Mexico has 64.72% or 1,713,030 acre-feet of the water storage at Amistad/Falcon.

**Allocations:** As of the August ownership report printing, the U.S. stored approximately 1.75 million acre-feet or 95% at Amistad and approximately 987,000 acre-feet or 63.9% at Falcon.

**Storage & Loss Amistad vs. Falcon:** The U.S. is currently storing approximately 1.77 million acre-feet or 96.2% at Amistad, and approximately 991,000 acre-feet or 63.9% at Falcon.

**Releases to Meet Demands:** Mexico released 356,022 acre-feet from Amistad and 861,233 acre-feet from Falcon for Mexico needs. The U.S. released 1,160,387 acre-feet from Amistad and 647,387 acre-feet from Falcon for U.S. needs. Combined with gains between Amistad and Falcon, U.S. inflows to Falcon totaled 738,100 acre-feet. So far, the U.S. met 64% of overall needs in the middle and Lower Rio Grande directly from middle Rio Grande and Amistad inflows this year.

**Upper Rio Grande (New Mexico):** Elephant Butte in New Mexico is currently storing 448,322 acre-feet or 22.16% of capacity. Caballo Dam, downstream of Elephant Butte, is storing 34,050 acre-feet or 15% of capacity. This water storage, in part, was used to meet water needs in the El Paso area.

**Outlook:** All active accounts began 2009 with 100% usable balances. To help alleviate losses in Falcon, the U.S. will continue to monitor ownership and elevation levels in both Falcon and Amistad so that U.S. transfers of water from Amistad to Falcon can be most efficient. Heavy early September rains brought significant and widespread improvements to the drought conditions affecting Central and Southern Texas for the first time in several months and the Seasonal Outlook through December 2009 calls for additional improvements throughout the regions.

# 7. SOUTH TEXAS WATERMASTER – GUADALUPE / LAVACA / SAN ANTONIO / NUECES REGION

September brought some much needed rainfall across most of the South Texas and the Concho River Basin. The majority of the heavy rains fell east of San Antonio but there were still significant showers throughout the area. According to the U.S. Drought Monitor, the rains caused a large portion of South Texas to move from "Exceptional Drought" conditions to "Severe and Extreme Drought". Flooding was reported throughout the area with very heavy rains in the Lavaca area. Stream flows showed improvement throughout South Central Texas.

Area Counties: Bandera, Blanco, Comal, Kendall and Kerr Counties

**Rainfall and Area Conditions:** The area received widely scattered rainfall from five to nine inches during September. With that rainfall, the Texas Crop Moisture Index classified the area of the Hill Country as "Moisture Adequate". Most of the surface water diversions in the area were for municipal and industrial uses with a few surface water permit holders irrigating hay and sod fields. The U.S. Drought Monitor indicated the area is currently in "Severe Drought" to "Extreme Drought" conditions.

**Stream Flow Conditions**: Stream flows of the major streams and their tributaries all flowed below average. With the scattered rains, the Guadalupe River showed some increase in flow during September. The Medina and the Sabinal Rivers have no surface flow in some segments. Most of the larger secondary tributaries also showed no surface flows.

Site	Ending Flows CFS	Historical Mean CFS
Guadalupe River near Kerrville	50	94
Guadalupe River near Comfort	60	122
Medina River at Bandera	1.5	161

**Drought Restrictions:** In the Guadalupe River Basin above Canyon Lake, no State permit holders reached their flow restrictions. Due to the lack of flow, State water permit holders in the San Antonio River Basin above Lake Medina are not diverting at this time. All Temporary Water Permits are curtailed.

**Area Counties:** Bee, Goliad, Victoria, Calhoun, Jackson, Refugio, Aransas, San Patricio, Nueces, Kleberg, Jim Wells, Duval, Live Oak, Kenedy, Willacy, Brooks, and Jim Hogg.

**Rainfall and Area Conditions:** The area received much needed rainfall during September. The widely and sparsely scattered showers provided minimal relief to the continued drought conditions. Stream flows rapidly increased due to the runoff from the rains, but quickly declined. Most of the area streams flowed below what is expected for this time of the year. It was reported that area crops continue to fail due to extended drought conditions. The U.S. Drought Monitor indicated "Exceptional Drought" to "Extreme Drought" conditions continue to prevail throughout the counties in South and Central Texas. Most surface water diversions in the area continue to be for municipal and industrial uses, with little irrigational use.

# Stream Flow Conditions:

Site (Years of Record)	Beginning Flows CFS	Ending Flows CFS	Historical Mean CFS
Guadalupe River near			
Victoria (74)	150	418	1,820
San Antonio River near	400	100	0.15
Goliad (73)	100	182	815
San Antonio River at			
McFaddin below Goliad (2)	125	389	736
Guadalupe River near			
Tivoli (2)	315	998	2,680
Mission River near Refugio			
(69)	0	0.22	60
Nueces River at Calallen			
Dam (9)	7	248	394
Aransas River near			
Skidmore (44)	0.73	1.5	33

The saltwater barrier on the Guadalupe River, near Tivoli, Texas, was activated several times during July. The saltwater barrier is activated or engaged to prevent the intrusion of saltwater and the subsequent contamination of fresh water when low stream flows occur.

**Corpus Christi Reservoir System:** The Corpus Christi Reservoir System received some inflows during September and the level of the reservoir system rose slightly. The Corpus Christi Reservoir System was at 58.7% of capacity, or 558,967 acre-feet, compared to 83.9% of capacity, or 799,330 acre-feet, during the same time last year. The level of Choke Canyon dropped to 69.8% of capacity, or 485,507 acre-feet, compared to 86.27% of capacity, or 599,573 acre-feet, during the same time last year. Lake Corpus Christi was at 28.6% of capacity, or 73,460 acre-feet, compared to 77.6% of capacity, or 199,757 acre-feet, last year. Corpus Christi continued to divert much of its monthly water supply needs from Lake Texana.

**Drought Restrictions:** Some stream flow restrictions of water rights in the area were reached, including the City of Victoria. Victoria is currently allowed to exchange ground water from city wells from the Guadalupe River.

Area Counties: Edwards, Real, Kinney, Uvalde, Zavala, Dimmit, La Salle and Webb.

**Rainfall and Area Conditions:** The Southwest Texas area received some relief from the drought during September. However, due to the overall lack of rainfall for the year, the rain was not enough to bring the area out of the drought. There were small rain showers reported during the beginning of the month with heavy rain reported during the middle of the month. The month ended with widespread substantial rainfall for the entire area, ranging from three to six inches. Most of the diversions of surface water were for irrigational use and small amounts for municipal and industrial uses. Crops irrigated in the area are: cotton, hay grazers, and pecans. Soil conditions improved due to the rainfall. The U.S. Drought Report indicated the area is experiencing "Moderate Drought" to "Extreme Drought" conditions at this time.

Site	Ending Flows CFS	Last Month CFS	Historical Mean CFS
Nueces River at Laguna	74	17	142
Nueces River at Brackettville	0.01	0.0	14
Nueces River below Uvalde	4.6	2.8	111
Frio River at Concan	21	2.8	106
Sabinal River at Sabinal	0.37	0.01	15
Leona River near Uvalde	0.0	0.0	40

#### Stream Flow Conditions:

Stream flows of intermittent and tributary streams in the area were flowing well below average for this time of year.

**Drought Restrictions:** Currently, two permits with stream flow restrictions were curtailed. Permits that have not met their stream flow restrictions were regulated. Permit holders in the area were asked to cut back on pumping usage. The Zavala/Dimmit Water District has a rotational diversion schedule on the Nueces River to ensure adequate water for domestic and livestock use. Temporary permits were curtailed on the Nueces, Sabinal and the Leona rivers.

**Area Counties:** Atascosa, Karnes, Gonzales, Wilson, McMullen, Dewitt, Guadalupe, Lavaca, Fayette, Colorado, Wharton, and Jackson

**Rainfall and Area Conditions:** The southern portions of this area received 4.5 to 14 inches of rainfall during September. The remainder of the area, including the Lavaca area, received six to 16 inches. Hay crop conditions improved and farmers began to plant winter oats and rye. Irrigation activities decreased to a minimum due to the significant precipitation in the area. Lake Texana was at 74% of capacity, 39.10 ft. above mean sea level. This is a 12% decrease in the lake level since August.

According to the U.S. Drought Monitoring System, most of the area is experiencing "Severe Drought" to "Exceptional Drought" conditions at this time.

Site	Beginning flows CFS	Ending flows CFS	Historical Mean CFS
San Antonio River near Falls			
City	72	219	221
Cibolo Creek near Falls City	11	23	24
Guadalupe River near			
Gonzales	236	425	878
The Lavaca River at Edna	3	19	31
Navidad River near			
Halletsville	0	21	8.3
Atascosa River near Whitsett	0	28	5.7
Frio River near Tilden	0.46	1.2	18
Nueces River near Tilden	0	0	64

Stream flow Conditions: Stream flow conditions in the area improved during September.

**Drought Restrictions:** Currently, there are no restricted permits due to drought conditions in the area.

**Area Counties:** Bastrop, Bexar, Blanco, Caldwell, Comal, Fayette, Frio, Guadalupe, Hays, and Medina.

**Rainfall and Area Conditions:** Widespread rain fell across the San Antonio Regional Area during September. Rainfall for the month measured at the San Antonio International Airport was 4.03 inches; the average rainfall for September is three inches. The total year-to-date rainfall is 14.78 inches. Normal year-to-date rainfall is 24.52 inches. The U.S. Drought Monitor dated September 22, 2009 indicated the San Antonio Regional Area is experiencing "Exceptional Drought" to "Extreme Drought" conditions, impacting crops, pastures, grasslands, stream flows, and reservoir capacities. Ground moisture rapidly diminished with above average temperatures, high winds, lack of cloud cover, and little to no rain. Fall plowing and planting were well underway.

**Stream Flow Conditions:** The Guadalupe, Medina, and Blanco Rivers improved with the widespread rainfall for September. However, historical stream flows were still well below the historical mean flows. Small creeks were still dried up. Historical mean stream flows indicated the severity of the current drought. Municipal use increased with residential lawn irrigation. Industrial use remained constant. The San Marcos River is currently under a staggered pumping schedule tied to current real time stream flows and priority dates.

The Canyon Lake Reservoir was at 70.48% of capacity, impounding 266,968 acre-feet. The Lake Medina Reservoir was at 24.09% of capacity, impounding 61,397 acre-feet. On September 28, 2009, the Edwards Aquifer level at the J17 well in Bexar County was at 661.8 feet.

Site	Ending Flows CFS	Historical Mean CFS
Blanco River at Wimberley	24	88.2
San Marcos River at Luling	136	283
Guadalupe River at Spring Branch	56	296
San Marcos Springs	98	164
Comal Springs	214	270

**Drought Restrictions:** Most Temporary Permits were not allowed to divert surface water. Surface water permits are closely monitored to determine if "real time" stream flows are allowed to divert. Surface water permits with stream flow restrictions were triggered and cut off.

Area Counties: Sterling, Tom Green, Irion, Concho, Coke, Glasscock, Runnels, Reagan, and Schleicher.

The Concho River Valley received above average amounts of rainfall during September. According to information provided by the USDA, the State Drought Monitor listed the Concho Valley in a "Normal" condition.

**Rainfall and Area Conditions:** Rainfall in San Angelo for the month of September was 5.68 inches. Areas surrounding San Angelo received slightly higher rainfall amounts. The average rainfall amount for the month of September is 3.10 inches. The total amount of rainfall for the year-to-date is 19.70 inches. Area reservoirs showed a slight decrease in amount of storage from the previous month's amounts. The Texas Crop Moisture Index indicated the soil moisture content is "Adequate". Cotton was established and should begin harvest by mid-month. Wheat was planted. Currently, there is a reduced demand by appropriated surface water rights in the Concho Valley. This is due to cessation of irrigation of cotton crops. There are adequate supplies of surface water in the area at this time.

# **Stream Flow Conditions:**

Site (Years of Record)	Ending Flows CFS	Historical Mean CFS
USGS Gaging System at Spring		
Creek/Twin Buttes (6)	2.5	5.4
USGS Gaging System at Concho		
River/San Angelo (78)	13	46
USGS Gaging System at South		
Concho/Christoval (76)	15	18

Lake Nasworthy was at 86% of capacity or 8,753 acre-feet. O.C. Fisher was at four percent of capacity or 4,326 acre-feet. Twin Buttes Lake was at 23% of capacity or 41,913 acre-feet.

**Drought Restrictions:** Temporary Permits were allowed to divert surface water. Surface water permits were closely monitored. No additional restrictions on diversions were put in to effect in the Concho Valley at this time.

#### 8. UPPER COLORADO (Concho River watershed not included)

The Upper Colorado River area received more than normal precipitation during September. The National Weather Service reported monthly precipitation was 5.66 inches for the region, 2.71 inches below normal. The reported year-to-date annual rainfall is 20.93 inches. According to the U.S. Drought Monitor, no drought conditions were indicated. USGS gauges indicated there was little to no flow in the Colorado River from Gail down to Ballinger. The San Saba River flowed below the historical USGS long-term median in the upper reaches but above the median in the lower reaches. The Llano River and its tributaries flowed above the USGS long-term median. Despite the more than normal precipitation, the pool levels of EV Spence and OH Ivie Reservoir decreased slightly during September, holding at levels of 6% and 45% of capacity, respectively.

# 9. TEXAS PANHANDLE AND SOUTHERN HIGH PLAINS

**Amarillo Area:** The Amarillo region reported the following summary for the Northern panhandle area:

Lake Meredith ended the month at 47.23 feet; Lake Greenbelt ended September at 52 feet; and, Lake MacKenzie ended the month at 71.73 feet. The National Weather Service in Amarillo reported a total rainfall during September of 1.88 inches.

**Lubbock Area:** Lubbock received 2.46 inches of rain during September, which is near average. Since the beginning of the year, Lubbock received a total of 1.48 inches of precipitation. This is 5.20 inches below normal. No new communities were added to the water restrictions list during September.

Lubbock and Amherst remained on mandatory drought restriction status. Ralls, Crosbyton, Spur, Post, White River WCS, and Valley WSC in the South Plains area remained on voluntary drought restriction status.

**White River Lake:** The lake pool elevation was 23 feet below full capacity. White River WSD has groundwater wells on standby if the lake level drops below usable levels.

**Lake Alan Henry:** The pool elevation was at full capacity. A new surface water treatment package plant is now online and can produce up to 144,000 gallons per day for use by the community that lives around this lake. The City of Lubbock is currently in the planning stages to construct water pipeline between the Lake Alan Henry and the City of Lubbock. The plans are to lay the pipeline and a have new surface water treatment plant constructed in Lubbock by 2012.

#### **10. WILDLIFE CONCERNS**

No information was received by the time of this report.

# 11. AGRICULTURE CONCERNS

Rainfall over the last month had a beneficial impact on agricultural conditions. In general, rains were too little and too late for most of South Texas, the Gulf Coast, North Central and

East Texas. The majority of the corn crop in the North Texas Blacklands and the Upper Coast was severely damaged by the summer drought; which was followed by prolonged rains after harvest maturity, further decreasing quality and harvestable yield. Another issue faced by producers of wheat and oats, as well as farmers and ranchers planting winter pasture or trying to harvest a fall hay cutting, was army worms, which tend to be destructive of tender, new tissue, particularly in the falls following a dry summer. This was troublesome as supplies of hay and winter feed were generally very short across the State due to the prolonged drought, and insects damaged badly needed forages for winter feed.

Cool weather and some light frost slowed maturity and terminated crops in the High Plains and Rolling Plains. The majority of the wheat crop was planted, with the remaining acres in the region waited on surface moisture.

The following are comments regarding agricultural conditions across the State over the last week from AgriLife Extension reporters.

**South:** The weather was mild, with scattered rains in some areas and heavy rainfall in others. Grasses responded well to rain and warm days and pastures are slowly greening up. Producers prepared to harvest hay for winter. Livestock were in good condition, but in some counties ranchers still hauled water. More rain was needed to fill ponds and tanks in many areas. Wheat and oats plantings completed with some fields already emerging. The cotton harvest was nearly completed. The peanut harvest was expected to begin in approximately two weeks. Producers began planting spinach.

**Central:** Runoff from rains began to fill stock tanks. New growth on Bermuda grass pastures and fields with emerged wheat or oats were heavily infested by army worms. Livestock were in good condition, with supplemental feeding slowed thanks to recent grass growth. Initial soybean yields were low.

**Coastal Bend:** Temperatures were near normal with scattered rainfall reported throughout the region. Minor field and pasture flooding resulted with little harmful effect. Sesame and sunflowers continued to dry down. Pastures slowly recovered from the drought. In Victoria County, 800 round bales of hay for drought relief were dispersed to 18 ranchers. The hay was shipped from Arkansas and sold to ranchers for \$35 per bale. Additional shipments were scheduled for the coming weeks.

**Southeast:** Rain filled stock tanks and improved crop conditions. Volunteer rye grass and clovers appeared. Producers reported significant damage to pastures and hay fields from army worms. In Chambers County, the rice ratoon crop harvest continued. Producers planted or prepared to plant rye grass to offset forage deficits from the summer drought. The condition of livestock improved with increased grass growth and availability of water. Soybeans appeared beneficial, with some fields in the bloom stage.

**East:** Many counties continued to receive beneficial amounts of rain. Hay was harvested as weather permitted. Winter pastures were planted and prepared. Livestock were in positive condition. Several counties reported heavy infestations of army worms.

**Far West:** Isolated showers brought 0.5 to one inch of rain. Pastures remained dry. The majority of pecans filled out. Producers began defoliating cotton and harvesting was expected to start.

**North:** Soil moisture ranged from adequate to surplus. Recent rains helped grasses grow and establish winter pasture. The hay crop for this year was of good quantity but low quality.

The corn harvest was finished, and sorghum harvest neared completion. Early reports indicate sorghum yields would be average. Soybeans started to change color and drop leaves, and below-average soybean yields were predicted. The cotton and rice harvests continued. Peanuts were in fair condition. Livestock were in fair to good condition. Wheat producers prepared fields, but were not expected to be able to plant wheat for grain until late October or early November. Fall army worms took a toll on early planted wheat, oats, and the last cutting of Bermuda grass hay.

**Panhandle:** Topsoil moisture was short with no rain reported during the beginning of October. Cooler temperatures occurred over the majority of the area with low-lying areas showing frost. The corn harvest began with a slow start due to wet fields. Cotton was in beneficial condition with bolls from 25 to 90 percent open. Growers continued to defoliate some fields in preparation for harvest. The peanut harvest started in some areas. Sorghum continued to mature. Soybeans were 50 percent harvested in some areas. Wheat was 60 to 80 percent planted. The wheat that was planted was 25 to 60 percent emerged. Cattle were in beneficial condition, and the weaning of calves was expected to begin. Rangeland was in fair condition.

**Rolling Plains:** Cool, wet weather stimulated growth of cool-season grasses and the winter wheat crop. Wheat producers worried about army worms, grasshoppers and many other problems associated with early planting, but feared dry weather more and continued planting. However, the rain came too late to help cotton. The grain sorghum harvest was nearly completed. Some hay was cut and baled. Cattle on rangeland showed beneficial body-condition scores. Producers looked for affordable hay in anticipation of winter feeding.

**South Plains:** Mild and dry conditions continued with high winds coming late in the reporting period. Soil moisture was short to adequate. The corn and milo harvests progressed well. Cotton was in fair to good condition. Growers continued to defoliate cotton, but harvesting only began in a few fields. The grain sorghum and sunflower harvests were ongoing as conditions allowed. Producers planted winter wheat and digging and harvesting peanuts. Pastures and rangeland were in fair to good condition. Livestock were in good condition with continued supplemental feeding.

**Southwest:** Areas of the region received as much as eight inches of rain, greening up the warm-season grasses which survived the drought. Where less hardy rangeland grasses died from the drought, the greening was from lower-quality grasses and weeds. The greenup improved prospects for remaining livestock and wildlife. However, year-to-date cumulative rainfall remained significantly below the long-term average, and more rain is needed to sustain production. The rain interrupted the cotton harvest, but the crop was mostly harvested and stalks destroyed for boll-weevil control. Peanuts and some pecans took full advantage of the rainfall and made beneficial progress. The pecan harvest was expected to begin as soon as orchard floors dry. The fall sweet-corn harvest continued with some fields scheduled to mature in November in time for Thanksgiving sales. Fall-planted cabbage, pickling cucumbers and green beans made beneficial progress. The cabbage harvest began.

**West Central:** The region reported humid, warm days and cool nights with scattered showers. Soil moisture conditions were excellent. Planting of fall crops was in full swing and cotton looked productive. Producers continued baling and cutting hay. Rangeland and pastures were in good condition as winter forages and cool-season grasses greened up. However, stock tanks and pond levels remained low. Livestock were in good condition with continued supplemental feeding. Pecan shuck split began and growers prepared for harvest, expecting a productive crop.

#### **12. WILDFIRE CONCERNS**

The Keetch-Byram Drought Index (KBDI) is used to help determine potential for fire risk. It is a numerical index where each number is an estimate of the amount of precipitation, in 100ths of an inch, needed to bring the soil back to saturation. The index ranges from 0 to 800, with 0 representing a saturated soil, and 800 a completely dry soil. The relationship of the KBDI to fire danger is, as the index increases, the vegetation is subjected to increased moisture stress. KBDI levels and its relationship to expected fire potential are reflected in the following:

**KBDI = 0 – 200**: Soil moisture and large class fuel moistures are high and do not contribute much to fire intensity. This is typical of spring dormant season following winter precipitation.

**KBDI = 201 – 400**: Typical of late spring; early growing season. Lower litter and duff layers are drying and beginning to contribute to fire intensity.

**KBDI = 401 – 600**: Typical of late summer, early fall. Lower litter and duff layers contribute to fire intensity and will burn actively.

**KBDI = 601 – 800**: Often associated with more severe drought and increased wildfire occurrence. Intense, deep-burning fires with significant downwind spotting can be expected. Live fuels can also be expected to burn actively at these levels.

There are currently 104 counties, illustrated in Attachment 2, with KBDI values in excess of 400, indicating areas within these counties are beginning to experience or sustain dry conditions which could result in an increased fire risk potential.

The Council, which is chaired by Jack Colley, Assistant Director, Texas Division of Emergency Management, is composed of state agencies concerned with the effects of drought and fire on the citizens of the State of Texas. The attached information was compiled and provided by representatives listed below. Points of contact, telephone numbers, and web site addresses are also provided.

Jack Colley, Assistant Director, Texas Division of Emergency Management, (512) 424-2443, fax (512) 424-2444, web site: <u>http://www.txdps.state.tx.us/dem</u>

John Sutton, Texas Water Development Board, (512) 463-7988, fax (512) 463-9893, web site: <u>http://www.twdb.state.tx.us</u>

Chris Loft, Texas Commission on Environmental Quality, (512) 239-4715, fax (512) 239-4770, web site: <u>http://www.tceq.state.tx.us</u>

Richard Egg, Texas State Soil & Water Conservation Board, (254) 773-2250, fax (254) 773-3311, web site: http://www.tsswcb.state.tx.us

Lance Williams, Texas Department of Agriculture, (512) 463-3285, fax (800) 835-2981, web site: <u>http://agr.state.tx.us</u>

Dr. Travis Miller, Texas AgriLife Extension Service, (979) 845-4808, fax (979) 845-0456, web site: <u>http://texasextension.tamu.edu</u>

Cindy Loeffler, Texas Parks & Wildlife Department, (512) 912-7015, fax (512) 707-1358, web site: <u>http://www.tpwd.state.tx.us</u>

Department of Housing and Community Affairs, (512) 475-3329, fax (512) 475-7498, web site: <u>http://www.tdhca.state.tx.us</u>

Carla Baze, Texas Department of Transportation, (512) 416-3270, fax (512)416-2941, web site: <u>http://www.txdot.state.tx.us</u>

Michael Dunivan, Texas Forest Service, (830) 997-5426, web site: <u>http://txforestservice.tamu.edu</u>

Paul Tabor, Texas Department of State Health Services, (512) 801-9816, fax (512) 458-7211, web site: <u>http://www.dshs.state.tx.us/</u>

Thomas Walker, Office of the Governor, Economic Development & Tourism, (512) 936-0169, fax (512) 936-0141, web site: <u>http://www.governor.state.tx.us/divisions/ecodev</u>

David A. Van Dresar, Texas Alliance of Groundwater Districts, (979) 968-3135, fax (979) 968-3194, web site: <u>http://www.texasgroundwater.org/</u>

Dr. John W. Nielsen-Gammon, Office of the State Climatologist, (979) 862-2248, fax (979) 862-4466, web site: <u>http://www.met.tamu.edu/osc/</u>

Gus Garcia, Texas Department of Rural Affairs, (512) 936-7876, fax (512) 936-6776, web site: <u>http://www.tdra.state.tx.us</u>

CC:

Amy Jeter, Committee Clerk, Senate Finance Committee Sarah Hicks, Committee Director, Senate Finance Committee Teddy Carter, Committee Clerk, Senate Natural Resources Committee Amy Peterson, Committee Clerk, House Appropriations Elizabeth Fazio, Committee Clerk, House Natural Resources Committee Jim Terrell, Committee Clerk, House Agriculture and Livestock Committee Andrew Cates, Committee Clerk, House Criminal Jurisprudence Committee Zak Covar, Policy Advisor for TCEQ Issues, Governor's Policy Office Auburn Mitchell, Policy Advisor for Agriculture/TDA, Governor's Policy Office Carmen Cernosek, Lt. Governor's Natural Resources Policy Analyst Shane Linkous, Deputy Division Chief, Intergovernmental Relations, Attorney General's Office Allan B. Polunsky, Chairman, Public Safety Commission C. Tom Clowe, Jr., Member, Public Safety Commission Ada Brown, Member, Public Safety Commission John Steen, Member, Public Safety Commission Carin Marcy Barth, Member, Public Safety Commission Colonel Steven McCraw, Director, Department of Public Safety Lt. Colonel Lamar Beckworth, Deputy Director, Department of Public Safety Lori Gabbert, Budget Analyst, Legislative Budget Board (LBB-DPS)

Tom Lambert, Budget Analyst, Legislative Budget Board (LBB-TCEQ) Ed Perez, Executive Director, Texas Office of State-Federal Relations, Washington, DC

Brandon Steinmann, Director, Texas Office of State-Federal Relations, Austin, Texas



Attachment 2 Counties with High to Extreme Fire Danger





**DROUGHT PREPAREDNESS COUNCIL** 

RICK PERRY Governor 5805 N. Lamar Blvd. P.O. Box 4087 Austin, Texas 78773-0220 Phone: (512) 424-2138 Fax: (512) 424-2444 JACK COLLEY Council Chairman

December 10, 2009

TO: The Honorable Rick Perry, Governor, State of Texas

The Honorable David Dewhurst, Lieutenant Governor, State of Texas

Ms. Esperanza Andrade, Secretary of State, State of Texas

The Honorable Robert Duncan, President Pro-Tempore of the Senate, State of Texas

The Honorable Joe Straus, Speaker of the House, State of Texas

The Honorable Steve Ogden, Chairman, Senate Finance Committee, State of Texas The Honorable Kip Averitt, Chairman, Senate Natural Resources Committee, State of Texas The Honorable John Carona, Chairman, Senate Committee on Transportation & Homeland Security, State of Texas

The Honorable Jim Pitts, Chairman, House Appropriations Committee, State of Texas The Honorable Allan Ritter, Chairman, House Natural Resources Committee, State of Texas The Honorable Yvonne Gonzalez-Toureilles, Chairman, House Agriculture & Livestock Committee, State of Texas

The Honorable Pete Gallego, Chairman, House Criminal Jurisprudence Committee, State of Texas

Mr. Ray Sullivan, Chief of Staff, Office of the Governor

Mr. Josh Havens, Texas Governor's Office of Homeland Security

FROM: Chief Jack Colley, Chairman, Drought Preparedness Council

# SUBJECT: Statewide Drought Situation Report

Jack Colley, Chairman Texas Division of Emergency Mgmt

Lance Williams, Member Texas Department of Agriculture

Carla Baze, Member Texas Department of Transportation

Chris Loft, Member Texas Commission on Environmental Quality

> Michael Dunivan, Member Texas Forest Service

John Sutton, Member Texas Water Development Board

Dr. Travis Miller, Member Texas Cooperative Extension

David A. Van Dresar, Member Texas Alliance of Groundwater Districts

Thomas Walker, Member Office of the Governor Economic Development & Tourism

Gus Garcia, Member Texas Department of Rural Affairs Richard Egg, Member State Soil & Water Conservation Board

Cindy Loeffler, Member Texas Parks & Wildlife Department

Suzanne Burnham, Member Texas Department of State Health Services

Dr. John W. Nielsen-Gammon, Member Office of the State Climatologist

# 1. NEXT COUNCIL MEETING

January 8, 2010, 2:00 p.m., Audit & Inspection Conference Room, Texas Department of Public Safety Headquarters, Building A, 5805 N. Lamar Blvd., Austin, Texas.

#### 2. GENERAL CONDITIONS

November 2009 was drier than normal across most of Texas, but the rainfall in areas with above normal precipitation was greatly beneficial. The November dryness in North Central and Northeast Texas alleviated a dangerous flooding situation after the torrential rainfall in October. Further south, "Exceptional Drought" was eradicated in South Texas by the end of the month. "Exceptional Drought" was not present in Texas by the end of November, a condition not seen in more than a year according to the United States Drought Monitor (USDM). The western half of Texas was drier than normal for the fourth consecutive month, which has caused drought to develop in the southern Panhandle and Trans-Pecos regions.

The South Central, Coastal Bend, and Lower Valley regions picked up three to five inches of precipitation, with isolated areas receiving ten inches. However, long-term precipitation deficits remained large in these regions, so the drought has not ended in a hydrological sense. The past few months were very dry in a six-county region just north of Del Rio, and November did little to improve what developed into an "Extreme Drought." This area in Southwest Texas and the "Extreme Drought" area in South Texas, an area from Nueces County to northern Zapata County, were classified as long-term droughts with hydrologic impacts. A shorter-term, agricultural drought was classified as moderate by the USDM in the southwestern Panhandle by the end of the month.

Though the El Nino Southern Oscillation was in a positive phase, the dryness in Texas over the first half of November was contrary to the typical wetness associated with El Nino. The only widespread rainfall occurred in South Central Texas on November 8, with Hurricane Ida providing most of the moisture. A cold front brought wet weather to the eastern half of Texas on November 16 and 17, with rainfall totals generally less than an inch. A low in the Gulf of Mexico was a major rainmaker in the core of the drought region in South Texas, with a broad region receiving more than three inches of precipitation. Aransas County was hardest hit with radar estimates of more than 10 inches of rain on November 19 and additional rainfall on November 20. Another cold front, which left bitterly cold air and snow behind in the Panhandle, brought a large area of half an inch to an inch of rain in East Texas the final day of November.

During the month, both Corpus Christi and Victoria saw more than double the normal precipitation expected in November. However, the recent rainfall had only minimal impacts on recharging the water supplies for both Corpus Christi and Victoria, though residents were only encouraged to voluntarily conserve water. November dryness was particularly evident in the Edwards Plateau and Low Rolling Plains, with a large area receiving less than a quarter inch of rainfall. San Angelo, Abilene, Midland, Wichita Falls, Lubbock, and Amarillo typically do not receive much precipitation in November, but the past month's dryness was particularly extreme. These areas saw significant summertime precipitation, so a few months of fall and winter dryness should not cause stress on water resources.

According to the Climate Prediction Center (CPC), the warm (El Nino) phase of the El Nino-Southern Oscillation remained in place during November and is expected to continue through the end of Northern Hemisphere winter. The current one-month forecast calls for a 33-40% chance of above normal December precipitation North Central Texas and the Edwards Plateau. A 40-50% chance of above normal December precipitation is forecasted by the CPC in Central and East Texas, while areas within 100 miles of the entire Texas coast have a greater than 50% chance of above normal precipitation. The three-month outlook forecasted by the CPC, which is valid for December through February, shows a 33-40% chance of above normal precipitation in the southern Panhandle, North Central Texas, and East Texas. A 40-50% chance of above normal precipitation is forecasted for the Upper Coast, Central Texas, and the Edwards Plateau. A greater than 50% chance of above normal precipitation is forecasted for South Central and South Texas, including both regions classified as "Extreme Drought" at the end of November. Overall, the next three months should bring improvement to the drought situation in all of the State.

### 3. OVERALL STATEWIDE DROUGHT CONDITIONS

The cooler air and rain continued to improve moisture conditions across Texas. Most regions are now in normal or wet conditions. The severity has been reduced for those that were still in drought. Detailed drought conditions per index can be summarized as follows:

According to the Palmer Drought Severity Index (PDSI), the High Plains and Trans-Pecos regions were in a "Mildly Dry" condition. The remaining regions were reported not to show drought conditions.

According to the Crop Moisture Index (CMI), all regions with the exception of the South Central, Upper Coast, and East Texas regions were in a "Slightly Dry" condition. According to the Texas Water Development Board (TWDB) scale, the CMI varies from flooding, standing water, fields too wet, moisture adequate, mildly dry, abnormally dry, excessively dry, severely dry, and extremely dry in order of increasing severity.

According to the Six-Month Standardized Precipitation Index (SPI), the Lower Valley region was in a "Moderately Dry" condition. The remaining regions were in a "Near Normal" condition. The SPI varies from extremely wet conditions, very wet, moderately wet, near normal, moderately dry and, severely dry, extremely dry in order of increasing severity.

# 4. WATER UTILITY STATUS

December 2009 began with 342 public water systems with water conservation restrictions. Mandatory watering schedules were imposed by 183 water systems and 49 asked for voluntary reductions in usage. In addition, 110 public water systems were able to relax all restrictions and return to normal operation. Recent rains continued to help by reducing water demand and increasing ground and surface water supplies in some areas of the State.

Increased rainfall and reduced demand allowed additional public water systems to relax or remove water restrictions.

# 5. WATER RIGHTS – STATEWIDE

New temporary water use permit applications were reviewed on a site-specific basis. Permits were issued if there was sufficient surplus water at the requested source. Applications for new water use permits and amendments to existing permits remained normal for the month. Until April 1, 2010, the water rights owners in the Brazos River Basin whose permits contain Hale Clause restrictions may observe the less severe stream flow restrictions of permits. The availability of unappropriated water for new water use permits continued to decrease in all river basins in the State. The search for long-term, dependable alternate sources of water remains a high priority issue.

# 6. WATER RIGHTS – LOWER RIO GRANDE / RIO GRANDE WATERMASTER (RGWM)

**Current Overall Conditions:** As of November 21, 2009, the U.S. combined ownership at Amistad/Falcon stood at 79.42% of conservation capacity or 2,693,989 acre-feet of temporary conservation capacity. Overall, the system is holding 81.32% or 4,816,428 acre-feet of conservation capacity with Amistad at 95.97% or 3,143,933 acre-feet and Falcon at 63.19% or 1,672,495 acre-feet. Mexico has 83.86% or 2,122,439 acre-feet of the water storage at Amistad/Falcon.

**Storage & Loss Amistad vs. Falcon:** The U.S. is currently storing approximately 1.72 million acre-feet or 93.7% at Amistad, and approximately 970,000 acre-feet or 62.5% at Falcon.

**Releases to Meet Demands:** Mexico released 374,469 acre-feet from Amistad and 879,930 acre-feet from Falcon for Mexico needs. The U.S. released 1,264,933 acre-feet from Amistad and 755,176 acre-feet from Falcon for U.S. needs. Combined with gains between Amistad and Falcon, U.S. inflows to Falcon totaled 852,293 acre-feet. So far, the U.S. met 67% of overall needs in the middle and Lower Rio Grande directly from middle Rio Grande and Amistad inflows this year.

**Upper Rio Grande (New Mexico):** Elephant Butte in New Mexico is currently storing 479,129 acre-feet or 23.68% of capacity. Caballo Dam, downstream of Elephant Butte, is storing 26,753 acre-feet or 11.79% of capacity. This water storage, in part, was used to meet water needs in the El Paso area.

**Outlook:** All active accounts began 2009 with 100% usable balances. To help alleviate losses in Falcon, the U.S. will continue to monitor ownership and elevation levels in both Falcon and Amistad so U.S. transfers of water from Amistad to Falcon can be most efficient. According the latest U.S. Drought Monitor, "Severe Drought" to "Moderate Drought" conditions continued across Zapata, Jim Hogg, Brooks, and Kenedy Counties, with "Abnormally Dry" to "Near Normal" conditions over the Lower Rio Grande Valley.

# 7. SOUTH TEXAS WATERMASTER – GUADALUPE / LAVACA / SAN ANTONIO / NUECES REGION

November continued to bring much needed rainfall across most of the South Central Texas and the Concho River Basin. Although rains greatly improved a majority of the drought conditions throughout the area, there was a narrow band showing "Exceptional Drought" conditions. This area stretched from the coast near Corpus Christi across to the area of Zapata and Webb Counties. The drought conditions continued to improve moving into December.

Area Counties: Bandera, Blanco, Comal, Kendall and Kerr Counties

**Rainfall and Area Conditions:** The area received scattered rainfall from 4 to 5 inches during November. The Texas Crop Moisture Index classified the area of the Hill Country as "Mildly Dry." Most of the surface water diversions in the area were for municipal and industrial uses with a few surface water permit holders irrigating hay and sod fields. The U.S. Drought Monitor indicated the area is currently in "Severe Drought" to "Abnormally Dry" conditions.

**Stream Flow Conditions**: Flows of the major streams and their tributaries still flowed below average. With the scattered rains, the Guadalupe, Medina, and Sabinal Rivers showed some increase in flow during November. Most of the larger secondary tributaries also showed no surface flows.

Site	Ending Flows CFS	Historical Mean CFS
Guadalupe River near Kerrville	79	109
Guadalupe River near Comfort	112	156
Medina River at Bandera	52	95

**Drought Restrictions:** No State permit holders reached their flow restrictions in the Guadalupe River Basin above Canyon Lake. State water permit holders in the San Antonio River Basin above Lake Medina are not diverting at this time, due to the lack of the flow. All Temporary Water Permits are reviewed on a case by case basis.

**Area Counties:** Bee, Goliad, Victoria, Calhoun, Jackson, Refugio, Aransas, San Patricio, Nueces, Kleberg, Jim Wells, Duval, Live Oak, Kenedy, Willacy, Brooks, and Jim Hogg.

**Rainfall and Area Conditions:** The area received much needed rainfall during November. Some areas received as much as four inches while other areas received only scattered to isolated rain showers. Stream flows rapidly increased due to the runoff from the rains. Most of the area streams flowed above what is expected for this time of the year. The U.S. Drought Monitor indicated "Moderate Drought" to "Severe Drought" conditions continue to prevail throughout the counties in South and Central Texas. Duval, Jim Hogg, Jim Wells, and portions of Kleberg and Nueces Counties experienced "Exceptional Drought" conditions. Most surface water diversions in the area continue to be for municipal and industrial uses, with little irrigational use.

Site (Years of Record)	Beginning Flows CFS	Ending Flows CFS	Historical Mean CFS
Guadalupe River near			
Victoria (75)	3,000.0	1,550.0	1,910.0
San Antonio River near			
Goliad (75)	1,300.0	882.0	580.0
San Antonio River at			
McFaddin below Goliad (2)	4,500.0	1,360.0	685.0
Guadalupe River near			
Tivoli (2)	3,200.0	3,140.0	2,910.0
Mission River near Refugio			
(69)	70.0	78.0	29.0
Nueces River at Calallen			
Dam (9)	0.0	5.7	883.0
Aransas River near			
Skidmore (44)	10.0	11.0	6.6

# Stream Flow Conditions:

Stream flows of the Guadalupe River continued to flow over the saltwater barrier near Tivoli, Texas.

**Corpus Christi Reservoir System:** The Corpus Christi Reservoir System received some inflows during November and the level of the reservoir system rose slightly. The Corpus

Christi Reservoir System was at 58.3% of capacity, or 555,209 acre-feet, compared to 78.6% of capacity, or 749,056 acre-feet, during the same time last year. The level of Choke Canyon dropped to 68.1% of capacity, or 473,646 acre-feet. Lake Corpus Christi was at 31.7% of capacity, or 81,563 acre-feet, compared to 68.1% of capacity, or 175,241 acre-feet, last year. Corpus Christi continued to divert much of its monthly water supply needs from Lake Texana.

**Drought Restrictions:** No drought restrictions of water rights were reached.

Area Counties: Edwards, Real, Kinney, Uvalde, Zavala, Dimmit, La Salle and Webb.

**Rainfall and Area Conditions:** The Southwest Texas area received some relief from the drought during November. However, due to the overall lack of rainfall for the year, the rain was not enough to bring the area out of the drought. There were small rain showers reported during the beginning of the month with heavy rain reported during the middle of the month. The month ended with light showers for the entire area, ranging from half an inch to five inches. Most of the diversions of surface water were for irrigational use and small amounts for municipal and industrial uses. Crops irrigated in the area are: cotton, hay grazers, and pecans. Soil conditions improved due to the rainfall. The U.S. Drought Report indicated the area is experiencing "Moderately Dry" to "Extreme Drought" conditions at this time.

#### Stream Flow Conditions:

Site	Ending Flows CFS	Last Month CFS	Historical Mean CFS
Nueces River at Laguna	51.0	53.0	124.0
Nueces River at Brackettville	0.02	0.03	3.6
Nueces River below Uvalde	5.2	5.2	82.0
Frio River at Concan	34.0	34.0	94.0
Sabinal River at Sabinal	2.4	0.74	9.9
Leona River near Uvalde	0.0	0.0	46.0

Stream flows of intermittent and tributary streams in the area were flowing well below average for this time of year.

**Drought Restrictions:** Currently, one permit with stream flow restrictions was curtailed. Permits that have not met their stream flow restrictions were regulated. The Zavala/Dimmit Water District has a rotational diversion schedule on the Nueces River to ensure adequate water for domestic and livestock use. Temporary permits were curtailed on the Nueces, Sabinal and the Leona rivers.

**Area Counties:** Atascosa, Karnes, Gonzales, Wilson, McMullen, Dewitt, Guadalupe, Lavaca, Fayette, Colorado, Wharton, and Jackson

**Rainfall and Area Conditions:** The southern portions of this area received 4 to 8.5 inches of rainfall during November. The remainder of the area, including the Lavaca area, received 8 to 12 inches. Hay crop conditions improved and farmers began to plant winter oats and rye. Irrigation activities decreased to a minimum due to the significant precipitation in the area. Lake Texana was at 100% of capacity, or 44.10 feet above mean sea level. This is the second month Lake Texana was at 100% of capacity.

According to the U.S. Drought Monitoring System, most of the area is experiencing "Normal" to "Abnormally Dry" conditions at this time.

Site	Beginning flows CFS	Ending flows CFS	Historical Mean CFS
San Antonio River near Falls			
City	360.0	1,010.0	265.0
Cibolo Creek near Falls City	32.0	274.0	30.0
Guadalupe River near			
Gonzales	1,680.0	3,300.0	1,260.0
The Lavaca River at Edna	64.0	1,860.0	47.0
Navidad River near			
Halletsville	6.8	210.0	23.0
Atascosa River near Whitsett	12.5	152.0	10.0
Frio River near Tilden	17.0	15.0	42.0
Nueces River near Tilden	0.0	3.5	6.5

Stream flow Conditions: Stream flow conditions in the area improved during November.

**Drought Restrictions:** Currently, there are no restricted permits due to drought conditions in the area.

**Area Counties:** Bastrop, Bexar, Blanco, Caldwell, Comal, Fayette, Frio, Guadalupe, Hays, and Medina.

**Rainfall and Area Conditions:** Widespread rain fell across the San Antonio Regional Area during November. Month-to-date rainfall measured at the San Antonio International Airport was 1.32 inch; the average rainfall for November is 2.58 inches. The total year-to-date rainfall is 28.74 inches. Normal year-to-date rainfall is 30.96 inches. The U.S. Drought Monitor dated November 24, 2009 indicated the San Antonio Regional Area is experiencing "Abnormally Dry" to "Normal" conditions. Ground moisture was excellent with widespread rainfall, cooling temperatures, and cloud cover. Fall plowing and planting were well underway. Currently, winter oats, mustard greens, turnips, beets, carrots, Swiss chard, collard greens, and spinach were planted.

**Stream Flow Conditions:** The Guadalupe, Medina, and Blanco Rivers improved with the widespread rainfall during November. Small creeks, springs, and perennial creeks flowed. Municipal use dropped with the steady rains throughout the month and there was no need for lawn irrigation. Industrial use remained constant.

The Canyon Lake Reservoir was at 78.89% of capacity, impounding 298,827 acre-feet. The Lake Medina Reservoir was at 25.61% of capacity, impounding 65,258 acre-feet. On November 30, 2009, the Edwards Aquifer level at the J17 well in Bexar County was at 667.7 feet.

Site	Ending Flows CFS	Historical Mean CFS
Blanco River at Wimberley	144	127
San Marcos River at Luling	330	404
Guadalupe River at Spring Branch	165	314
San Marcos Springs	202	167
Comal Springs	299	293

Drought Restrictions: Currently, there are no drought restrictions on surface water permits in the San Antonio Regional Area.

Area Counties: Sterling, Tom Green, Irion, Concho, Coke, Glasscock, Runnels, Reagan, and Schleicher.

The Concho River Valley received above average amounts of rainfall during September. According to information provided by the USDA, the State Drought Monitor listed the Concho Valley in a "Normal" condition.

**Rainfall and Area Conditions:** The Concho Valley received rainfall amounts well below average during November. Rainfall in San Angelo was 0.05 inch. Areas surrounding San Angelo received slightly higher rainfall amounts. The average rainfall amount for the month of November is 1.20 inch. The total amount of rainfall for the year-to-date is 23.08 inches. Area reservoirs showed a slight decrease in amount of storage from the previous month's amounts. The Texas Crop Moisture Index indicated the soil moisture content is "Adequate". Cotton was established and should begin harvest by mid-month. Wheat was planted. Currently, there is a reduced demand by appropriated surface water rights in the Concho Valley. This is due to cessation of irrigation of cotton crops. There are adequate supplies of surface water in the area at this time.

#### Stream Flow Conditions:

Site (Years of Record)	Ending Flows CFS	Historical Mean CFS
USGS Gaging System at Spring		
Creek/Twin Buttes (7)	8.4	16.0
USGS Gaging System at Concho		
River/San Angelo (79)	13.0	25.0
USGS Gaging System at South		
Concho/Christoval (76)	18.0	21.0

Lake Nasworthy was at 82% of capacity or 8,336 acre-feet. O.C. Fisher was at four percent of capacity, impounding 4,136 acre-feet. Twin Buttes was at 22% of capacity, impounding 41,319 acre-feet.

**Drought Restrictions:** Temporary Permits were allowed to divert surface water. Surface water permits were closely monitored. No additional restrictions on diversions were put in to effect in the Concho Valley at this time.

# 8. UPPER COLORADO (Concho River watershed not included)

The Upper Colorado River area received more than normal precipitation during November. The National Weather Service reported monthly precipitation was 0.01 inch for the region, 1.09 inch below normal. The reported year-to-date annual rainfall is 23.86 inches. According to the U.S. Drought Monitor, the area is in "Normal" to "Moderate Drought" conditions. USGS gauges indicated there was little to no flow in the Colorado River from Gail down to Ballinger. The San Saba River flowed above the historical USGS long-term median in the upper reaches but above the median in the lower reaches. The Llano River and its tributaries flowed above the USGS long-term median. The pool levels of EV Spence and OH lvie Reservoir decreased slightly during November, holding at levels of 5% and 43% of capacity, respectively.

# 9. TEXAS PANHANDLE AND SOUTHERN HIGH PLAINS

**Amarillo Area:** The Amarillo region reported the following summary for the Northern panhandle area:

Lake Meredith ended the month at 46.18 feet; Lake Greenbelt ended November at 51.73 feet; and, Lake MacKenzie ended the month at 70.73 feet. The National Weather Service in Amarillo reported total year-to-date rainfall is 20.91 inches.

Lubbock Area: Lubbock received 0.13 inch of rain during November, which is near average.

Lubbock and Amherst remained on mandatory drought restriction status. Ralls, Crosbyton, Spur, Post, White River WCS, and Valley WSC in the South Plains area remained on voluntary drought restriction status. No new communities were added to the water restrictions list during October.

**White River Lake:** The lake pool elevation was 23.0 feet below full capacity. White River WSD has groundwater wells on standby if the lake level drops below usable levels.

**Lake Alan Henry:** The pool elevation was at three feet below capacity. A new surface water treatment package plant is now online and can produce up to 144,000 gallons per day for use by the community that lives around this lake. The City of Lubbock is currently in the planning stages to construct water pipeline between the Lake Alan Henry and the City of Lubbock. The plans are to lay the pipeline and a have new surface water treatment plant constructed in Lubbock by 2012.

#### **10. WILDLIFE CONCERNS**

No information was received by the time of this report.

#### 11. AGRICULTURE CONCERNS

Early cold weather shut down warm season pastures across all of the State. Widespread rain and snow was beneficial to small grains. Wet weather over the months of October and November resulted in the failed planting of approximately 50% of the wheat crop in the Blacklands. These acres should be planted to grain or cotton crops in the spring.

The regions of the State most affected by dry weather at this time are the Panhandle/High Plains region, where the wheat crop would benefit from moisture and parts of South,

Southwest and the lower parts of the Gulf Coast, where stock tanks remain low. Grazing is short and soil moisture profiles are short for spring planting.

The following are comments made by Texas AgriLife Extension Service district reporters on agricultural conditions across the State for the week beginning November 30.

**South:** With the exception of Webb and Cameron Counties, all counties reported adequate soil moisture levels. Cold, overcast weather with some rain slowed field activity and peanut harvesting in the northern part of the region. Two inches of rain fell in the eastern part of the region. The recent rain helped dryland wheat and oats in the western part of the region. Cabbage and spinach harvesting resumed where fields were dry enough. In the southern part of the region, crops progressed well, forage availability was fair and the tomato harvest began. Warm-season forage production ended due to low temperatures, but it was expected with continued moisture, cool-season native grasses should provide good grazing. Livestock were in fair condition. Stock tank water levels remained the limiting factor. Livestock producers were increasing supplemental feed rations due to cold and wet weather.

**Central:** Cold fronts brought rain, helping maintain high soil moisture. Most of the region received a freeze, which stopped all warm-season grass growth and ended hay production. Most producers planned to use standing forage for winter.

**Coastal Bend:** Approximately half an inch to two inches of rain was followed by sleet, snow flurries and a hard freeze. Farmers did not perform any field work due to wet soils. Soil moisture levels were in good condition.

**East:** Parts of the region received as much as four inches of rain, followed by the first freeze of the year, ending the growing season. Winter oats, rye, and wheat pastures made beneficial growth. Livestock producers fed hay and other supplements. Cattle were in fair to good condition and fall calving continued.

**Far West:** The pecan and cotton harvests were put on hold due to snow and rain. Approximately two to ten inches of snow fell in the region. Fields were too wet for any farming activity. The main cotton harvest was finished, but many modules remained in the field. Cotton remaining in the field awaited drier conditions. Winter wheat growth slowed due to low temperatures.

**North:** Soil-moisture levels were in the surplus range for most of the region. Some counties had rain and colder temperatures with a little snow. The wet conditions halted all field work. There were also reports of frost and hard freezes. Nearly half of the planned wheat acres were not planted at this date as wet field prevented planting. Due to the late date, it is likely that fields not planted to wheat at this time will be planted to spring crops. The soybeans, sorghum and cotton harvests were finished. The cold, wet weather was hard on livestock, but most appeared to be in good shape going into the winter. Because winter pastures were not ready for grazing, many cattle producers were forced to provide considerable amounts of supplemental feed and hay.

**Panhandle:** Much colder temperatures were experienced throughout the region. Soil moisture levels were short. Some cotton was harvested, with the harvest expected to be completed by Christmas. Dryland wheat was stressed by low temperatures and dry conditions. Cattle producers spent more time supplementing cattle and breaking ice in stock water tanks. Rangeland deteriorated, with most counties reporting it to be in poor to fair condition.

**Rolling Plains:** Winter hit hard in parts of the region. Rain, sleet and a small amount of snow were followed by a hard freeze in some counties. The moisture stopped the cotton harvest but was beneficial for wheat, pastures, and rangeland. Livestock producers fed cattle supplemental protein on a regular basis but did not need to feed hay. More than an average number of stocker cattle were put on wheat. Most of the wheat producers in the region completed or nearly completed planting. Some wheat producers found rust in several varieties. Insect activity was otherwise low, while greenbugs were present but not at economically significant thresholds.

**South Plains:** A cold blast came to the region. The high on December 3 was 30 degrees. On December 4, temperatures ranged from 18 to 36 degrees, with half an inch to three inches of snow. Soil moisture was short to adequate. The cotton and sorghum harvests were nearly complete. Many gins were approximately two-thirds finished ginning. Winter wheat continued to mature. Pastures and rangeland were in poor to fair condition. The cold weather stressed area livestock, and producers continued with supplemental feeding.

**Southwest:** There was a hard freeze December 5, with lows in the low 20s. The impact on vegetable crops was not yet known, but losses were expected. The only other frost this fall was light and did not occur in all areas, so some crops may not have developed adequate cold tolerance. The pecan harvest was nearly complete. The lettuce, cabbage and spinach harvests continued. Producers were preparing fields for potato planting, which should begin soon after Christmas.

**West Central:** The region experienced lower than normal temperatures with freezing rain in many areas. The cotton harvest slowed due to wet conditions, but field activity was expected to pick up as fields dried out. Small grain fields progressed well. Rangeland and pastures were improving as cool-season grasses began growing after recent moisture. Livestock remained in fair to good condition, and producers increased supplemental feeding. Stock pond levels were higher. The pecan harvest was slowed by the wet weather. The crop looked productive overall, but prices were down.

# **12. WILDFIRE CONCERNS**

The Keetch-Byram Drought Index (KBDI) is used to help determine potential for fire risk. It is a numerical index where each number is an estimate of the amount of precipitation, in 100ths of an inch, needed to bring the soil back to saturation. The index ranges from 0 to 800, with 0 representing a saturated soil, and 800 a completely dry soil. The relationship of the KBDI to fire danger is, as the index increases, the vegetation is subjected to increased moisture stress. KBDI levels and its relationship to expected fire potential are reflected in the following:

**KBDI = 0 - 200**: Soil moisture and large class fuel moistures are high and do not contribute much to fire intensity. This is typical of spring dormant season following winter precipitation.

**KBDI = 201 – 400**: Typical of late spring; early growing season. Lower litter and duff layers are drying and beginning to contribute to fire intensity.

**KBDI = 401 - 600**: Typical of late summer, early fall. Lower litter and duff layers contribute to fire intensity and will burn actively.

**KBDI = 601 – 800**: Often associated with more severe drought and increased wildfire occurrence. Intense, deep-burning fires with significant downwind spotting can be expected. Live fuels can also be expected to burn actively at these levels.

There are currently 47 counties, illustrated in Attachment 2, with KBDI values in excess of 400, indicating areas within these counties are beginning to experience or sustain dry conditions which could result in an increased fire risk potential.

The Council, which is chaired by Jack Colley, Assistant Director, Texas Division of Emergency Management, is composed of state agencies concerned with the effects of drought and fire on the citizens of the State of Texas. The attached information was compiled and provided by representatives listed below. Points of contact, telephone numbers, and web site addresses are also provided.

Jack Colley, Assistant Director, Texas Division of Emergency Management, (512) 424-2443, fax (512) 424-2444, web site: <u>http://www.txdps.state.tx.us/dem</u>

John Sutton, Texas Water Development Board, (512) 463-7988, fax (512) 463-9893, web site: <u>http://www.twdb.state.tx.us</u>

Chris Loft, Texas Commission on Environmental Quality, (512) 239-4715, fax (512) 239-4770, web site: <u>http://www.tceq.state.tx.us</u>

Richard Egg, Texas State Soil & Water Conservation Board, (254) 773-2250, fax (254) 773-3311, web site: http://www.tsswcb.state.tx.us

Lance Williams, Texas Department of Agriculture, (512) 463-3285, fax (800) 835-2981, web site: <u>http://agr.state.tx.us</u>

Dr. Travis Miller, Texas AgriLife Extension Service, (979) 845-4808, fax (979) 845-0456, web site: <u>http://texasextension.tamu.edu</u>

Cindy Loeffler, Texas Parks & Wildlife Department, (512) 912-7015, fax (512) 707-1358, web site: <u>http://www.tpwd.state.tx.us</u>

Carla Baze, Texas Department of Transportation, (512) 416-3270, fax (512)416-2941, web site: <u>http://www.txdot.state.tx.us</u>

Michael Dunivan, Texas Forest Service, (830) 997-5426, web site: <u>http://txforestservice.tamu.edu</u>

Suzanne Burnham, Texas Department of State Health Services, (512) 801-9816, fax (512) 458-7111, web site: <u>http://www.dshs.state.tx.us/</u>

Thomas Walker, Office of the Governor, Economic Development & Tourism, (512) 936-0169, fax (512) 936-0141, web site: <u>http://www.governor.state.tx.us/divisions/ecodev</u>

David A. Van Dresar, Texas Alliance of Groundwater Districts, (979) 968-3135, fax (979) 968-3194, web site: <u>http://www.texasgroundwater.org/</u>

Dr. John W. Nielsen-Gammon, Office of the State Climatologist, (979) 862-2248, fax (979) 862-4466, web site: <u>http://www.met.tamu.edu/osc/</u>

Gus Garcia, Texas Department of Rural Affairs, (512) 936-7876, fax (512) 936-6776, web site: <u>http://www.tdra.state.tx.us</u>

CC:

Amy Jeter, Committee Clerk, Senate Finance Committee Sarah Hicks, Committee Director, Senate Finance Committee Teddy Carter, Committee Clerk, Senate Natural Resources Committee Amy Peterson, Committee Clerk, House Appropriations Elizabeth Fazio, Committee Clerk, House Natural Resources Committee Jim Terrell, Committee Clerk, House Agriculture and Livestock Committee Andrew Cates, Committee Clerk, House Criminal Jurisprudence Committee Zak Covar, Policy Advisor for TCEQ Issues, Governor's Policy Office Auburn Mitchell, Policy Advisor for Agriculture/TDA, Governor's Policy Office Carmen Cernosek, Lt. Governor's Natural Resources Policy Analyst Shane Linkous, Deputy Division Chief, Intergovernmental Relations, Attorney General's Office Allan B. Polunsky, Chairman, Public Safety Commission C. Tom Clowe, Jr., Member, Public Safety Commission Ada Brown, Member, Public Safety Commission John Steen, Member, Public Safety Commission Carin Marcy Barth, Member, Public Safety Commission Steven McCraw, Director, Department of Public Safety Lt. Colonel Lamar Beckworth, Deputy Director, Department of Public Safety Lori Gabbert, Budget Analyst, Legislative Budget Board (LBB-DPS) Tom Lambert, Budget Analyst, Legislative Budget Board (LBB-TCEQ)

Ed Perez, Executive Director, Texas Office of State-Federal Relations, Washington, DC

Brandon Steinmann, Director, Texas Office of State-Federal Relations, Austin, Texas

# Attachment 1 Climatic Regions



# Attachment 2 Counties with High to Extreme Fire Danger



# Appendix F


# Appendix G



HEY 5TH GRADERS!!!

MONEY MAY NOT GROW ON TREES BUT WITH A LITTLE EFFORT YOU COULD WIN A \$500, \$250, OR \$100 U.S. SAVINGS BOND!

To claim your prize, all you have to do is ENTER and WIN <u>Clearwater Undergound Water Conservation District's</u> <u>Annual ESSAY and POSTER CONTEST</u>

This year's theme: DON'T BE A WATER HOG—CONSERVE WATER

Think of some creative ways not to HOG water, and you might just win some cash to put in your piggy bank!





The Clearwater Undergound Water Conservation District (CUWCD) is sponsoring an essay and poster contest for all 5<sup>th</sup> grade students in Bell County. The entries should address ways that we can conserve and protect our water resources—both surface water and groundwater. Entries should include existing conservation practices as well as new and innovative ideas. Be creative and think outside that box!

See judging criteria on the back of this page.

All participants will receive a CUWCD complimentary packet. Prizes will be awarded to the top three entries in both the essay and poster categories as follows:

> 1<sup>st</sup> PLACE---\$500 SAVINGS BOND 2<sup>ND</sup> PLACE--\$250 SAVINGS BOND 3<sup>RD</sup> PLACE--\$100 SAVINGS BOND

Entries become the property of CUWCD upon submittal and may be reproduced by the District. Please contact the CUWCD office at 254–933–0120 for additional information.

Essays may be typed or handwritten (please make sure handwriting is legible). Posters must be at least 8  $\frac{1}{2}$  × 11" in size. All entries must be postmarked no later than **December 12**, **2008** and submitted to the following:

Clearwater UWCD		Essays may be faxed to:
PO Box 729	or	254-770-2360
Belton, TX 76513		Attn: Cheryl Maxwell

Entries may also be hand delivered to 2180 North Main in Belton <u>by 5:00 p.m. on December 12<sup>th</sup></u>. Please fill out the form below and attach it to each entry.

#### JUDGING CRITERIA FOR ESSAY AND POSTER CONTEST:

	<u>Content</u>	70%	
Knowledge of	f Existing Conservati	on Methods	40%
*New Ideas	for Conserving Wate	r	30%
	Presentation	30%	
Creativity			20%
Grammar/Sp	elling		5%
Neatness			5%

\*Be sure your entry (essay and/or poster) clearly identifies which methods are your original ideas and suggestions for conserving water.

#### Research Aid:

Several websites have water conservation tips—type the key words "water conservation" in your search engine. The CUWCD office also has a list of websites, brochures, and literature with information on water conservation. Call 254-933-0120 to visit with District staff.

Please complete the information below and attach it to the back of each entry:

Name:	Telephone No	
Address:		
School Name:	Teacher:	
School District:	Grade:	

# Appendix H



Home | About the District | News | Meetings | Management Plan | Registration and Rules | Aquifers | Education | District Data | Web Links | Contacts | Directions | Board Me Home 🎘 Education 🎘 Rainwater Harvesting

search...

C

**Rainwater Harvesting** 

alt ph 254-770-2370 **Clearwater District** fax 254-770-2360 ph 254-933-0120 **2180 North Main** Belton, TX 76513

# Rainwater Harvesting

Collecting rainwater from roofs and storing it for future use is a practical way to maximize the benefits of precipitation in Central Texas. In fact, cisterns that captured rainwater were a common way for early settlers to store water for everyday use. This old practice has now become modernized in Central Texas as several builders are installing rainwater harvesting systems to supply most or all of the water demands for homes and businesses. One famous example is the Lady Bird Johnson Wildflower Research Center in Austin. Typical rainwater harvesting systems include a large catchments area such as debris. A roof washer (with a 30 micron filter) is installed just before storage in large canks (50 to 15,000 gallon fiberglass). The storage tank may be buried underground or the roof of a home, gutters to transport rainfall, and screens which filter leaves and nidden among landscape.

One estimate by the Texas Cooperative Extension said that 0.6 gallons of water can be narvested for each square foot of roof per inch of rain received, depending on collection efficiency. For example, if an inch of rain falls on a 2,000 square foot roof surface, then 1,200 gallons of water can be harvested. An average rainfall year of 35 inches in Bell County would result in as much as 42,000 gallons of water harvested from rain. With Rainwater harvesting can also be done by simply placing barrels or buckets outside prior appropriate conservation measures, this may be sufficient to supply household needs.

to a rain event. Harvested water could be used for watering plants, however, this water would not be suitable for human consumption unless it is filtered and kept in a closed container.

to supply all or some of your water demands, we recommend calculating a water budget To best determine whether rainwater harvesting would be a practical way for your family

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using the online calculator found on the Texas Cooperative Extension's website. This website includes a detailed description of rainwater harvesting systems.

Also, check out the extensive rainwater harvesting manual developed by the Texas components, water treatment, design guidelines, water demand calculations, and cost estimates. A link to this manual is shown below along with other rainwater harvesting Water Development Board. It includes everything from rainwater harvesting system resources.

Filter

Rainwater Harvesting Contacts & Suppliers TCE Rainwater Harvesting Landscape Methods Rainwater Harvesting Manual **Item Title** 

<< Start < Prev 1 Next > End >>

Results 1 - 3 of 3

- **Recharge Enhancement and Brush Control** 
  - **Groundwater and the Hydrologic Cycle** 
    - Water Conservation and Water Quality

      - Plugging Abandonded Wells New Well Owner Information
- **Groundwater Conservation Districts** 
  - Back ]

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# Appendix I



Home | About the District | News | Meetings | Management Plan | Registration and Rules | Aquifers | Education | District Data | Web Links | Contacts | Directions | Board Me

Home 🎘 Education 🏷 Recharge Enhancement and Brush Control

search...

C

**Recharge Enhancement and Brush Control** 

# Recharge Enhancement and Brush Control

The Clearwater District's motto is "Every drop counts!" This statement becomes even more poignant as water supplies shrink because of drought and water demand increases with the predicted doubling of our State's population by 2050. As water planners and andowners grapple with lower flows in streams and the potential for declining water evels in aquifers, solutions such as enhancing recharge of groundwater and educating the public to conserve water must be realized.

alt ph 254-770-2370

fax 254-770-2360

**Clearwater District** 

2180 North Main Belton, TX 76513 ph 254-933-0120

These studies have generally shown that elimination and control of regrowth can enhance the recharge of groundwater and conserve water resources. The  $ar{T}$ exas State Soil and Water Conservation Board has implemented several brush control programs in Brush control has been studied to quantify the amount of water that can be saved through the elimination of unwanted brush such as mesquite, juniper, and saltcedars. watersheds across the State. More about these programs can be found by clicking here.

removal of ashejuniper on water yield in Hamilton and Coryell counties. The project is In our area, the Leon River Restoration Project is attempting to quantify the effects of currently in phase one, however, updates can be found by clicking here.

up lakes and reservoirs, increasing the salinity of the soil surface, competing with forage grasses and native plants, and degrading wildlife habitat."[1] As a result, private According to the Texas Cooperative Extension (TCE), unwanted brush can have negative These are described in detail in the TCE publication, Brush Management Methods. It can also effects on land resources such as "depleting groundwater, reducing stream flow, drying andowners may wish to learn more about the methods to control and manage brush. These may include mechanical, chemical, prescribed burning or biological methods. be downloaded by clicking on the item below.

As always, a landowner should weigh the positives and negatives before implementing

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Environmental Defense has prepared a fact sheet to help inform the public about the effectiveness of brush management and the related environmental impacts. This fact brush control measures. There are some desirable uses for brush such as food and cover for wildlife, atheistic appeal, and harvesting for wood burning and crafting. sheet can be found by clicking here.

http://tcebookstore.org/pubsearch.cfm, which has many publications viewable in .pdf visit the TCE bookstore, To learn more about brush control measures, form or available for purchase.

[1] Source: Texas Cooperative Extension, Biological Control of Saltcedar, October 21, 2006, Publication number L-5444. Filter

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Item Title Brush Management Fact Sheet Brush Control Manual << Start < Prev 1 Next > End >>

Results 1 - 2 of 2

- Rainwater Harvesting
- **Groundwater and the Hydrologic Cycle** 
  - Water Conservation and Water Quality
    - **Plugging Abandonded Wells**
- New Well Owner Information
- **Groundwater Conservation Districts** 
  - Back ]

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1/7/2010

# Appendix J

## Join us for the 8th Annual Bell County Water Symposium

Central Texas Council of Governments Building 2180 N. Main Street (old Walmart) Belton, Texas

> November 6, 2008 8:30 a.m.—4:00 p.m.

> > **AGENDA**

8:30 a.m.	Registration
9:00 a.m.	Welcome—Judy Parker (Clearwater District) Clearwater Update on Projects—Randy Williams (TCB, Inc.)
9:30 a.m.	Water Conservation "Points" in Green Building Ratings—Dick Peterson (Austin Energy)
10:15 a.m.	Break
10:30 a.m.	Water Transfers in Water Plans—Ron Kaiser (Texas A&M University)
11:15 a.m.	Water Conservation Through Brush Control—Charles Hart (TX AgriLife Extension)
12:00 Nooi	Lunch—The Water-Energy Connection—Ken Kramer (Sierra Club)
1:00 p.m.	Watershed Systems and Impairments—Jennifer Peterson (TX AgriLife Extension)
1:45 p.m.	Storm Water Management Plans in Bell County—Steven Veal (Jacobs Carter & Burgess)
2:45 p.m.	Break
3:00 p.m.	Water Issues/What to Expect Next Legislative Session—Greg Ellis (TX Alliance of Groundwater Districts)
3:45 p.m.	Closing Comments—Horace Grace (Clearwater District) & Dirk Aaron (TX AgriLife Extension)
	Three CEUs available for Licensed Private and Commercial Pesticide Applicators
	Please RSVP by October 29th Clearwater Underground Water Conservation District P.O. Box 729 Belton, TX 76513
	Phone: 254-933-0120 Fax: 254-770-2360 E-mail: cmaxwell@ctcog.org
	Symposium sponsored by the following: Clearwater Underground Water Conservation District Texas AgriLife Extension
	TCB, Inc. Llovd Gosselink Attorneys at Law

**Bell** County

# Appendix K

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Agency **Environmental Protection** U.S. and the Quality mental on Commission





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KEEP THESE PLACES BEAUTIFUL AND ENJOYABLE FOR ALL. NEVER LITTER OR DUMP GARBAGE ANYWHERE OTHER THAN WHERE THEY BELONG-WHEN YOU DUMP ON THE STREET OR YARD, THAT GARBAGE ENDS UP IN PLACES LIKE THESE EVEN WHEN YOU CAN'T SEE IT!

HERE ARE SOME MORE ADVANCED MEASURES YOU CAN TAKE TO HELP KEEP THE EARTH BEAUTIFUL AND DRINKABLE. TALK WITH YOUR FAMILY ABOUT IT AND WORK OUT A PLAN TO MAKE IT WORK! · CHOOSE PLANTS FOR LANDSCAPING THAT ARE NATIVE TO YOUR AREA. THEY REQUIRE LESS WATER, FERTILIZER AND PESTICIDES. · INSTALL & LOW-FLOW SHOWER HEAD, THEY SAVE WATER FOR YOU. · INSTALL A WATER-SAVING TOILET. YOU WON'T HAVE TO THINK ABOUT CONSERVING EXTRA WATER. · ASK ABOUT WATER-SAVING LANDSCAPE ALTERNATIVES OR UPDATED SPRINKLER SYSTEMS THAT CAN MEASURE WHEN YOUR PLANTS NEED WATER. · USE A MULCHING MOWER OR MULCHING BLADE TO CARE FOR YOUR YARD, OR START COMPOSTING YOURSELF FOR NATURAL FERTILIZERS.

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a friendly reminder from:



P. O. Box 729 • Belton, TX 76513 (254) 933-0120

www.clearwaterdistrict.org

The Clearwater Underground Water Conservation District was formed to protect the underground water resources of Bell County. These resources include the Trinity aquifer which underlies all of Bell County and the Edwards BFZ aquifer which is located in the southern portion of the County. Clearwater's mission is to develop and implement an efficient, economical and environmentally sound groundwater management program to protect and enhance the water resources of the District. Clearwater is funded by advalorem taxes and regulates water well drilling, spacing and pumping. Clearwater supports and promotes public education and conservation of all water resources in the County.

m00.001474748 • WWW. • 8474-244(008) 8401 North Central Expressway, Suite 300 • Dallas, Texas 75225 иәлелем



This Book Belongs To:

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**Joeldu**2

WATER IS ONE OF THE EARTH'S MOST PRECIOUS RESOURCES. WHY NOT PROTECT IT? YOU CAN DO YOUR PART TO PROTECT AND CONSERVE WATER-IT'S EASIER THAN YOU MIGHT THINK!

EVERYONE SHOULD DO THEIR PART THEREISN'T ANY EXCUSE NOT TO. HERE ARE SOMEEASY THINGS YOU CAN DO EVERYDAY TO HELP CONSERVE AND PROTECT OUR EARTH'S WATER SUPPLY. · TAKE SHORTER SHOWERS. YOU CAN SAVE ABOUT 5 GALLONS A MINUTE.

- DON'T USE THE TOILET AS A TRASH CAN, PUT LITTER IN ITS PLACE AND SAVE 7 GALLONS.
- · FIX ALL LEAKS IN YOUR HOME. YOU CAN SAVE THOUSANDS OF GALLONS A MONTH.
- · RUN YOUR DISHWASHER AND LAUNDRY MACHINES WHEN FULL.
- TURN OFF THE WATER WHEN YOU'RE BRUSHING YOUR TEETH OR WASHING YOUR HANDS YOU WILL SAVE ABOUT 2 GALLONS A MINUTE.
- · USE A BUCKET INSTEAD OF A HOSE TO WASH YOUR CAR OR PET. A RUNNING HOSE CAN USE 300 GALLONS AN HOUR.
- USE A BROOM OR RAKE TO CLEAR CONCRETE, NOT WATER.
- TAKE USED ANTIFREEZE AND OIL TO A DESIGNATED DISPOSAL SITE. DUMPING THEM IN THE GROUND POLLUTES WATER IN ALL OTHER AREAS.
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## are you keeping your water pure?

Groundwater is the supply of fresh water found beneath the earth's surface. Rainwater becomes ground-water once it falls to the ground and seeps into water-filled layers of sand or rock called "aquifers." Groundwater is naturally pure and can remain undisturbed for hundreds of years.

When grass clippings, pet waste, automotive products, fertilizers, pesticides and other chemicals wash down a storm drain, they don't go away. They flow into streams, rivers, lakes or bays, harming plants and animals and contaminating the water we drink. Here's how to ensure you keep our water as clean as possible:

YARD: Don't overfertilize. Sweep (do not wash) fertilizer and soil off driveways and walkways.

**PET:** Pick up pet waste from yards, trails and sidewalks.

**CAR:** Maintain your car to prevent oil leaks and recycle used motor oil.

HOME: Use nontoxic or natural household cleaning products. Recycle or properly dispose of household chemicals.



### word scramble Put the letters in the right order to complete the sentence: 1. All living things need \_ (TAWRE) to live. 2. When water evaporates, it travels into the air and becomes part of a (DLOCU). 3. Less than 1% of all the water on the earth is \_ (RSEHF). (IKRDN) water in the liquid form. 4. We 5. Check for leaks and save hundreds of (ALGNLOS) of water a day. 6. You'll save water by taking a quick (WSEROH). (KECBUT) and sponge 7. Wash bikes and cars with a instead of a running hose. 8. Ask your \_ (MFAIYL) to look for ways to save water Clearwater Underground Water Conservation District **Every drop counts!** The Clearwater Underground Water Conservation District was formed to protect the underground water resources of Bell County. These resources include the Trinity aquifer which underlies all of Bell County and the Edwards BFZ aquifer which is located in the southern portion of the County. Clearwater's mission is to develop and implement an efficient, economical and environmentally sound groundwater management

program to protect and enhance the water resources of

the District. Clearwater is funded by ad-valorem taxes

and regulates water well drilling, spacing and pumping.

Clearwater supports and promotes public education

and conservation of all water resources in the County.

FOR MORE INFORMATION Contact the Texas Commi

on Environmental Quality at 1-800-CLEANUP.

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Recyclable Paper



m00.00164244 • 8474-244(008) 8401 North Central Expressway, Suite 300 • Dallas, Texas 75225





This Book Belongs To:

Water 12 precious!

#### HELP CONSERVE THE EARTH'S MOST VALUABLE RESOURCE.

# Amazing water facts:

**ONLY 1% OF THE EARTH'S WATER IS SUITABLE** FOR HUMAN CONSUMPTION. While water covers nearly 80% of the earth's surface, only 1% of that is usable, fresh water. 2% of the water is frozen in glaciers, and 97% is salt water.

#### WE'RE DRINKING THE SAME WATER THAT THE

DINOSAURS DRANK! Water has been on earth for millions of years. Water cycles from the earth to the air and to the earth again continuously. This means that a dinosaur could have used your last drink of water!

A MILK COW DRINKS ABOUT 35 GALLONS OF WATER A DAY! Water is also used to grow the corn and alfalfa cows eat. From this, the cow produces almost six gallons of milk each day. That's 93 glasses!

FOR A LITTLE UNDER \$2, YOU CAN BUY an ice cream cone, a couple of soft drinks, two candy bars, or...about 1,000 gallons of clean drinking water delivered to your home!

#### IT TAKES 1 GALLON OF WATER TO PROCESS A QUARTER POUND OF HAMBURGER.

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www.clearwaterdistrict.org

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# Appendix L



CLEARWATER UNDERGROUND WATER CONSERVATION DISTRICT RESOURCE LIBRARY May 2009

#### Videotapes/DVDs

#### 1. WATER

Backyard Safari  $Pre-K - 2^{nd}$  Grade

Why is water so important to life? Youngsters learn why animals and plants have different ways of getting the water they need. They'll also see that water can be liquid, hard ice, or foggy steam. Teacher guide included. (30 minutes)

#### 2. WATER CYCLE—GO WITH THE FLOW

3-2-1 Classroom Contact Grades 4 – 6

Water on Earth is cleaned in a cycle of evaporation, condensation, and precipitation. Follow the flow from ocean to clouds to rain, discover how dirty water becomes clean, and learn how people fit into the water cycle. Teacher guide included. (15 minutes)

#### "3. WATER: FROM THE EARTH FOR YOU

Enviro-Tacklebox Grades 5 – 9

Demonstrates how a growing population has put increasing demands upon the world's finite resources. Teacher guide included. (20 minutes)

#### 4. GROUNDWATER

Earth Revealed—High School Edition Grades 9 – College

Explains how groundwater is distributed and measures its importance to human life. Teacher guide included. (15 minutes)

#### 5. MAJOR RIVERS

Brazos River Authority 4<sup>th</sup> Grade

Follow along with "Major Rivers" and his horse "Aquifer" as they provide an overview of water in Texas, to include groundwater, surface water, water treatment, wastewater treatment and conservation. (15 minutes)

#### 6. GROUNDWATER QUALITY: MANAGING THE RESOURCE The Water Education Foundation (California)

Since groundwater basins are out of sight under the earth, groundwater resources are easily overlooked and mismanaged. This program provides valuable information about how to better use and protect our precious groundwater supplies. (15 minutes)

#### 7. CONJUNCTIVE USE: A COMPREHENSIVE APPROACH TO WATER PLANNING

The Water Education Foundation (California)

This program simplifies an often misunderstood concept: conjunctive use coordinating surface water and groundwater supplies, which are often managed as separate resources. (11 minutes)

#### 8. WATER WELL BASICS

American Ground Water Trust Grade 6 and above

An educational video that shows step by step, the processes of well drilling, well construction and equipment installation needed to provide a safe home water supply. (15 minutes)

#### 9. DIVINING THE FUTURE: GROUNDWATER CONSERVATION DISTRICTS Taxos Alliance of Groundwater Districts: TCEO: Taxos Cooperative Extension: and

Texas Alliance of Groundwater Districts; TCEQ; Texas Cooperative Extension; and Texas Groundwater Protection Committee.

Video provides a general overview of groundwater conservation districts including their role and responsibilities as well as services they provide. (20 minutes)

#### **10. FOUNDATIONS: AQUIFERS OF TEXAS**

Texas Alliance of Groundwater Districts; TCEQ; Texas Cooperative Extension; and Texas Water Development Board.

Video provides general information on types of aquifers, recharge areas, water movement in aquifers, and water removal from aquifers. (10 minutes)

#### 11. CROSSROADS: TEXAS WATER LAW

Texas Alliance of Groundwater Districts; TCEQ; Texas Cooperative Extension; and Texas Groundwater Protection Committee.

Video provides general overview of water law in Texas as it relates to diffused surface water, surface water, and groundwater. (10 minutes)

#### 12. TEX\*A\*SYST: WELL PLUGGING—PLUGGING WATER WELLS IN TEXAS

Texas Agricultural Extension Service; Texas Groundwater Protection Committee.

Video focuses on landowners plugging large diameter water wells. Other videos in the TEX\*A\*SYST series include Introduction to TEX\*A\*SYST; Pesticides and Fertilizer Storage; Petroleum Product Storage; Household Hazardous Waste and Septic System; and Livestock Waste Management. (Approx. 10 - 15 minutes each)

#### 13. UNDERSTANDING TEXAS WATER ISSUES

Real Estate Center, Mays Business School, College Station, TX; Texas Cooperative Extension; Texas Water Resources Institute

Real estate professionals are caught in the middle of an economy that may soon be more dependent on water than oil. This video discusses the State's basic water dilemmas and solutions. CD also available. (45 minutes)

#### Videotapes/DVDs-continued

#### 14. BELL COUNTY WATER SYMPOSIUM—FALL 2002, 2003 & 2004

Clearwater Underground Water Conservation District

Set of videotapes documenting the November 7, 2002, November 19, 2003 and October 27, 2004 water symposiums. Topics include the following: 1) Legislative update on water issues; 2) Overview of Bell County aquifers; 3) Brazos G Regional Water Planning Group and the Brazos River Authority; 4) Role of water supply corporations and CCN's; 5) Water quality protection and water conservation; 6) and Rainwater harvesting. (Each tape approximately 2 hours)

#### 15. TEXAS: THE STATE OF WATER Vol. 1 & 2

Texas Parks and Wildlife Department

Texas The State of Water- Finding a Balance is an in-depth, hour long documentary presented and produced by the Texas Parks and Wildlife Department. The program explores how the demand for water will grow dramatically in years to come, and weighs the impact that growth will have on the state. The documentary shows how the steps we take – or do not take – will impact Texas and its people, wildlife and economic vitality for future generations. (Each video 1 hour)

#### **Books**

#### 1. THE WATER SOURCEBOOKS

Partnership of EPA, Region 4; Alabama Department of Environmental Regulation; LEGACY—Partners in Environmental Education; and Water Environment Federation

Series consists of a set of 4 volumes appropriate for Grades K-2, Grades 3-5, Grades 6-8, and Grades 9-12. The series explains the water management cycle using a balanced approach and how it affects every aspect of the environment. The curriculum provides strong science and math content, but also links these subject areas to social studies and language arts. Each Sourcebook contains hands-on activities and investigations, fact sheets, reference materials, and a glossary of terms.

#### 2. PROJECT WET CURRICULUM AND ACTIVITY GUIDE

Project WET—Water Education for Teachers Montana State University Texas Sponsor: Caddo Lake Institute

A collection of over 90 innovative, interdisciplinary activities that are hands-on, easy to use, and fun for Grades K-12. The Guide is divided into seven concept areas: chemistry and physics of water; life science; earth systems; natural resources; water resource management; society; and culture. Multidisciplinary activities are included, integrating language arts, mathematics, science, geography, history, government, and health.

#### 3. MAKING DISCOVERIES

The Groundwater Foundation

Groundwater activities for the classroom and community. What is an aquifer? How does groundwater get contaminated? Find the answers to these questions and more in this activity book. Through interactive water education experiences, students learn

concepts in science, math, language arts, social science, fine arts, and physical education. Hands-on activities focus on groundwater, surface water, wetlands, and pollution prevention.

#### 4. MAKING A BIGGER SPLASH

The Groundwater Foundation

This guide features best-loved water education and festival activities. All the activities in this collection are hands-on, brains-on fun and teach important water concepts to participants.

#### 5. HANDBOOK OF WATER USE AND CONSERVATION Amy Vickers WaterPlow Press

A comprehensive and authoritative handbook on water use and efficiency measures for those concerned about efficient water use. Includes ten key steps to a successful conservation program, water use characteristics of major customer sectors, water audit procedures, and hundreds of fact-filled tables, illustrations, and case studies.

#### **Miscellaneous**

#### 1. DRIPIAL PURSUIT

The Groundwater Foundation

A card game with interesting water trivia. Just how many gallons of water does it take to produce a hamburger, fries, and soft drink? The answer will surprise you! Dripial Pursuit questions relate to water, natural resources, and geography. The answers are interesting and intriguing and help everyone understand important water concepts.

#### 2. PUDDLE PICTURES

The Groundwater Foundation

Reinforce water lessons by playing this game based on the popular game *Pictionary*. Draw a water-related word and help teammates come up with the word on the card. Example: Can you draw the word "recharge"?

#### 3. THE JUG: A COMPLETE AQUIFER SCIENCE KIT The Groundwater Foundation

The JUG contains all the supplies needed to construct a groundwater flow model to help students "Just Understand Groundwater." The plastic 8 <sup>1</sup>/<sub>2</sub>" tall JUG comes with all the needed accessories and detailed instructions for experiments which enable the user to understand important concepts about groundwater including aquifer geology, water movement, water pumping, contamination and cleanup.

#### 4. WATER CONSERVATION LITERATURE PACKETS

Clearwater Underground Water Conservation District

Assembly of water conservation literature from various sources to include the Texas Water Development Board, US Geological Survey, WaterSmart, US Department of Agriculture and US Environmental Protection Agency.

# Appendix M

#### **Clearwater Underground Water Conservation District**

#### **Approved Budget FY09**

#### REVENUE

Total	\$ 537,700
Interest	\$ 15,536
Transport Fees	\$ 400
Application Fees	\$ 100
*Bell County Tax Appraisal District	\$ 521,664

\*Based on 2008 Certified values of \$13,041,597,498 Tax rate per \$100 valuation is \$0.0040

#### **EXPENDITURES**

Contracts				
Administrative	\$	265,000		
Legal	\$	50,000		
Professional/Technical Consulting	\$	50,000		
Appraisal District	\$	6,000		
Director's Compensation	\$	15,000		
Director Expenses	\$	10,000		
Equipment	\$	3,000		
Supplies	\$	1,000		
Insurance	\$	2,000		
Printing	\$	2,800		
Communications	\$	5,400		
Contingency Fund	\$	10,000		
Reserves for Uncollected Taxes	\$	10,000		
Special Programs				
Education	\$	15,000		
Education Supplies	\$	7,000		
Other	\$	4-500		
Water Quality Grant	\$	1,000		
Studies	\$	75,000		
GMA 8	\$	5,000		
Total	\$	537.700	~	
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#### CLEARWATER UNDERGROUND WATER CONSERVATION PROJECT OCTOBER 2008 THROUGH DECEMBER 2009

#### SCHEDULE OF REVENUES AND EXPENDITURES

#### **REVENUES:**

October 1, 2008 through December 31, 2009	
Bell County Tax Appraisal District	\$ 511,901
Application Fees	666
Transport Fees	279
Interest	6,005
Other	2,000
Revenues (October 1, 2008 thru December 31, 2009)	\$ 520,852
Carry forward from PY08	 553,869
Total Revenues	\$ 1,074,720

#### EXPENDITURES:

October 1, 2008 through December 31, 2009		
Administrative Services	\$225,494	
Board Expenditures	181,196	
Educational Special Programs	13,843	
Educational Supplies	3,683	
Speical Programs Other	2,462	
Water Quality Project	0	
Clearwater Studies	114,169	
Clearwater GMA 8	1,483	
Total Expenditures		\$ 542,330
REVENUES OVER EXPENDITURES		\$ 532,390

#### GMA8 JOINT FUND

REVENUES	\$ 7,514
EXPENDITURES:	\$ 7,514
REVENUES OVER EXPENDITURES	\$ -

# **Expenditures for FY09**





# Appendix N

#### 2008 - 2013 STRATEGIC PLAN OBJECTIVES

#### "A" Level Objectives

#### Goal #1: Monitor and manage groundwater in Bell County

- Ensure spring flow gauges in Salado Creek are fully functioning
- Establish 4 additional continuous monitor stations in aquifers
- o Enhance water quality monitoring program and data availability
- o Identify abandoned wells
- $\circ$   $\quad$  Cooperate with other groups on importance of well registration

# Goal #2: Maintain financial and organizational stability and effectiveness

- Develop policy for Board approval establishing goals and future uses for reserve funds in following areas:
  - Legal defense
  - Implementing science-related projects
  - Future building and relocation
  - Operating expenses

#### Goal #3: Educate and inform citizens

- o Develop aquifer information specific to Bell County
- o Educate real estate community on groundwater use and availability
- o Place more articles in local media on status of groundwater
- Use Community-In-Schools to disseminate information in local school districts
- $\circ$  Promote educational information on water quality testing
- Provide speaker program and identify target groups
- $\circ$   $\quad$  Promote water quality protection and water conservation

# Goal #4: Protect and advance the District's interest with governmental bodies and agencies

• Educate/inform local elected officials and government agency representatives about groundwater issues in Bell County

#### <u>"B" Level Objectives</u>

#### Goal #1: Monitor and manage groundwater in Bell

#### County

- Compare GAM (groundwater availability model) spatial distribution to actual pumping distribution in the aquifers—Trinity first, then Edwards
- Refine vertical limits of Trinity aquifer using the Clearwater well database
- Investigate and identify brackish water interfaces in Bell County (Edwards BFZ, middle Trinity, and lower Trinity)
- $\circ$   $\;$  Consider policy options for amending terms of operating permits \;
- Publish and publicize water level data and maps
- $\circ$   $\;$  Establish aquifer parameter data before managing by layers
- $\circ$  Inform citizens about importance of managing by layers
- $\circ$   $\;$   $\;$  Promote and support conversion to surface water in Bell County  $\;$

#### Goal #3: Educate and inform citizens

- $\circ$   $\;$  Increase presentations to schools and other organizations
- Create and produce videos on Clearwater District and groundwater resources
- Hire expert to help develop education program

#### Goal #4: Protect and advance the District's interest with governmental bodies and agencies

 Create awareness on ad valorem tax reform to allow lowering of taxes not subject to roll back

#### <u>"C" Level Objectives</u>

#### Goal #1: Monitor and manage groundwater in Bell

#### County

 Consider policy options for facilitating surface water supply implementation



Clearwater Underground Water Conservation District P.O. Box 729, Belton, TX 76513 254-933-0120 <u>www.clearwaterdistrict.org</u> August 2008

#### End of FY09 Annual Report

The Clearwater Directors and Staff thank you for supporting our efforts to protect the groundwater resources of Bell County and encourage all of you to do your part to be "Water Smart" and conserve all of our water resources.

# Water is Life

# **Every Drop Counts!**

Clearwater Underground Water Conservation District P.O. Box 729 2180 N. Main Street Belton, TX 76513 254-933-0120 (phone) 254-770-2360 (fax) www.clearwaterdistrict.org

District Manager: Cheryl Maxwell <u>cmaxwell@clearwaterdistrict.org</u>

