Coastal Bend Groundwater Conservation District

Management Plan Annual Report 2018

1.1 Performance Standard – The number of exempt and permitted wells registered by the District for the year will be incorporated into the Annual Report submitted to the Board of Directors of the District.

As of September 301, 2018, CBGCD had 5702 exempt wells registered.

1.2 Performance Standard – Each year the District will accept and process applications for the permitted use of groundwater in the District in accordance with the permitting process established by District Rules (Appendix B). The number and type of applications made for the permitted use of groundwater in the District and, the number and type of permits issued by the District will be included in the Annual Report given to the Board of Directors.

As of September 30, 2018, CBGCD had 975 non-exempt wells permitted.

Agriculture Irrigation – 812

Commercial/Industrial – 137

Municipal - 28

1.3. Performance Standard – Each year the District will utilize the monitor well network to take samples of water quality and to conduct regular measurements of the changing water levels in the aquifers of the District. The District will monitor the water levels in at least 10 wells monthly throughout the District. The District will also annually test the water quality in at least one well for each county precinct in Wharton County. A progress report on the work of the District regarding monitoring the water quality and water-levels of aquifers

Coastal Bend GCD Monthly Monitor Wells

Name	Casing	Depth	Slotting
:M 1299 well 1-1	12	90	60-90

:9(deg) 16(min) 42.62(sec)

)6(deg) 5(min) 3.92(sec)

Well Grid: 66-48-7

		1-Mar	4-Apr-05	5/2/2005	6/2/2005	7/2/2005	8/2/2005	9/1/2005	10/4/2005	11/3/2005	12/1/2005
		31.9	31.1	31.4	31.9	32	32.2	32.5	31.8	32	32.2
1/5/2006	2/5/2006	3/1/2006	4/1/2006	5/1/2006	6/1/2006	7/1/2006	8/1/2006	9/1/2006	10/5/2006	11/5/2006	12/5/2006
32.6	32.8	32.7	33.1	33	33.3	33.15	33.2	32.9	33.4	33.4	33.4
1/10/2007	2/5/2007	3/1/2007	4/1/2007	5/1/2007	6/1/2007	7/1/2007	8/1/2007	9/1/2007	10/5/2007	11/5/2007	12/18/2007
33.2	33.2	33.2	33.1	32.9	32.8	32.2	31.8	30.6	30.7	31.1	31.3
1/1/2008	2/1/2008	3/1/2008	4/1/2008	5/1/2008	6/1/2008	7/1/2008	8/1/2008	9/1/2008	10/1/2008	11/1/2008	12/1/2008
32.1	31.9	31.9	32		32.4	32.6	32.7	32.8	32.9	33.1	33.2
1/1/2009	2/1/2009	3/1/2009	4/1/2009	5/1/2009	6/1/2009	7/1/2009	8/1/2009	9/1/2009	10/1/2009	11/1/2009	12/1/2009
33.2	33.2	33.3	33.8	33.3	33.5	33.7	33.8	33.8	33.8	33.5	33.3
1/1/2010	2/1/2010	3/1/2010	4/1/2010	5/1/2010	6/1/2010	7/1/2010	8/1/2010	9/1/2010	10/1/2010	11/1/2010	12/1/2010
33.4	33.5	33.1	33	33	33.1	33.1	33.3	33.4	33.4	33.2	33.2
1/1/2011	2/1/2011	3/1/2011	4/1/2011	5/1/2011	6/1/2011	7/1/2011	8/1/2011	9/1/2011	10/1/2011	11/1/2011	12/1/2011
33.1	33.2	33.1	33.6	33.6	33.8	33.6	34.3	34.4	34.4	34.5	34.5
1/1/2012	2/1/2012	3/1/2012	4/1/2012	5/1/2012	6/1/2012	7/1/2012	8/1/2012	9/1/2012	10/1/2012	11/1/2012	12/1/2012
34.6	34.5	33.8	33.6	34	34.2	33.9	33.5	33.8	33.7	33.6	33.4
1/1/2013	2/1/2013	3/1/2013	4/1/2013	5/1/2013	6/1/2013	7/1/2013	8/1/2013	9/1/2013	10/1/2013	11/1/2013	12/1/2013
33.7	33.8	33.4	33.5	33.7	33.9	34.2	33.8	33.7	33.4	33.4	33.2
1/1/2014	2/1/2014	3/1/2014	4/1/2014	5/1/2014	6/1/2014	7/1/2014	8/1/2014	9/1/2014	10/1/2014	11/1/2014	12/1/2014
33.9	33.7	33.5	33.3	34	34.2	34.1	34.5	34.6	34.2	33.8	33.9
1/1/2015	2/1/2015	3/1/2015	4/1/2015	5/1/2015	6/1/2015	7/1/2015	8/1/2015	9/1/2015	10/1/2015	11/1/2015	12/1/2015
33.6	33.8	33.4	33.6	33.5	33.9	34	34.7	34.9	34.3	33.9	33.6
1/1/2016	2/1/2016	3/1/2016	4/1/2016	5/1/2016	6/1/2016	7/1/2016	8/1/2016	9/1/2016	10/1/2016	11/1/2016	12/1/2016
33.9	33.8	33.5	33.4	33.5	33.5	33.8	34.2	34.4	34.2	33.9	33.8
1/1/2017	2/1/2017	3/1/2017	4/1/2017	5/1/2017	6/1/2017	7/1/2017	8/1/2017	9/1/2017	10/1/2017	11/1/2017	12/1/2017
33.5	33.8	33.5	33.4	33.5	33.6	33.6	33.8	33.9	33.8	33.8	33.6
1/1/2018	2/1/2018	3/1/2018	4/1/2018	5/1/2018	6/1/2018	7/1/2018	8/1/2018	9/1/2018	10/1/2018	11/1/2018	12/1/2018
33.3	33.5	33.3	33.2	33.1	34.2	34.1	34	33.5	33.9	33.7	

Northing Rd. well 1-2	13	356 110-127			1-Mar	4-Apr-05	5/2/2005	6/2/2005	7/2/2005	8/2/2005	9/1/2005	10/4/2005	11/3/2005	12/1/2005
9(deg) 14(min) 52.29(sec)					47.6	48.9	51.5	50.6	55.9	56.1	57.6	56.8	55.2	53.5
6(deg) 1(min) 1.3(sec)		179-356	1/5/2006	2/5/2006	3/1/2006	4/1/2006	5/1/2006	6/1/2006	7/1/2006	8/1/2006	9/1/2006	10/5/2006	11/5/2006	12/5/2006
Vell Grid: 66-56-3			52.5	52	51.2	53	55.6	57.5	55.3	55.7	56.3	56.4	53.4	53.9
			1/10/2007	2/5/2007	3/1/2007	4/1/2007	5/1/2007	6/1/2007	7/1/2007	8/1/2007	9/1/2007	10/5/2007	11/5/2007	12/18/2007
			51.7	50.7	51.8	50.5	50.5	51.9	51.3	49.4	49.4	51.4	51.5	47.5
			1/1/2008	2/1/2008	3/1/2008	4/1/2008	5/1/2008	6/1/2008	7/1/2008	8/1/2008	9/1/2008	10/1/2008	11/1/2008	12/1/2008
			48	47.2	46.5	47.6		54.7	56.4	54.7	54.3	55.6	54.4	52.6
			1/1/2009	2/1/2009	3/1/2009	4/1/2009	5/1/2009	6/1/2009	7/1/2009	8/1/2009	9/1/2009	10/1/2009	11/1/2009	12/1/2009
			51.6	52.4	53.4	51.7	51.5	59.5	60.4	62.2	62.7	60.1	57.2	55.6
			1/1/2010	2/1/2010	3/1/2010	4/1/2010	5/1/2010	6/1/2010	7/1/2010	8/1/2010	9/1/2010	10/1/2010	11/1/2010	12/1/2010
			54.6	53	52.4	52.4	56.6	56.7	55.1	53.8	56.8	54.1	56.8	54.2
			1/1/2011	2/1/2011	3/1/2011	4/1/2011	5/1/2011	6/1/2011	7/1/2011	8/1/2011	9/1/2011	10/1/2011	11/1/2011	12/1/2011
			53.6	51.7	52.6	57.6	58.4	62.8	65.2	67.5	67.8	67.5	64.2	61.1
			1/1/2012	2/1/2012	3/1/2012	4/1/2012	5/1/2012	6/1/2012	7/1/2012	8/1/2012	9/1/2012	10/1/2012	11/1/2012	12/1/2012
			58.6	57.1	55.7	55.5	56.8	59.7	57.7	57.3	63.4	61	60.8	60.5
			1/1/2013	2/1/2013	3/1/2013	4/1/2013	5/1/2013	6/1/2013	7/1/2013	8/1/2013	9/1/2013	10/1/2013	11/1/2013	12/1/2013
			57.6	56.3	56.1	58	58.4	58.2	61.7	64.5	65.7	65	62.6	60.1
			1/1/2014	2/1/2014	3/1/2014	4/1/2014	5/1/2014	6/1/2014	7/1/2014	8/1/2014	9/1/2014	10/1/2014	11/1/2014	12/1/2014
			58.5	58.3	56.5	55.5	65.6	59.3	62.9	64.1	69.5	62.8	62.6	60.1
			1/1/2015	2/1/2015	3/1/2015	4/1/2015	5/1/2015	6/1/2015	7/1/2015	8/1/2015	9/1/2015	10/1/2015	11/1/2015	12/1/2015
			58.5	57	56.4	55.2	53.8	52.9	53.5	59.3	59.2	58.8	59.3	56.3
			1/1/2016	2/1/2016	3/1/2016	4/1/2016	5/1/2016	6/1/2016	7/1/2016	8/1/2016	9/1/2016	10/1/2016	11/1/2016	12/1/2016
			55.3	54.4	55.6	55.4	54.6	54.5	55.7	58	56.5	56.2	58	56.8
			1/1/2017	2/1/2017	3/1/2017	4/1/2017	5/1/2017	6/1/2017	7/1/2017	8/1/2017	9/1/2017	10/1/2017	11/1/2017	12/1/2017
			54.7	54.5	53.8	53.9	54.6	55.1	57.3	59.2	57.7	56.6	56.2	56.5
			1/1/2018	2/1/2018	3/1/2018	4/1/2018	5/1/2018	6/1/2018	7/1/2018	8/1/2018	9/1/2018	10/1/2018	11/1/2018	12/1/2018
			54.6	53.2	52.1	53.6	54.2	55.7	58.6	62.5	61.3	56.4	52.2	

Evergreen Cemetary well 1-4 4 70 64-70

29(deg) 19(min) 44.07(sec)

96(deg) 4(min) 1.1(sec)

Well Grid: 66-48-5

		1-Mar	4-Apr-05	5/2/2005	6/2/2005	7/2/2005	8/2/2005	9/1/2005	10/4/2005	11/3/2005	12/1/2005
		7.1	7.5	12.2	12.1	14.6	14.6	15.6	16.3	16.1	15.6
1/5/2006	2/5/2006	3/1/2006	4/1/2006	5/1/2006	6/1/2006	7/1/2006	8/1/2006	9/1/2006	10/5/2006	11/5/2006	12/5/2006
16	16.8	16.5	13.8	16.2	16.9	16.7	18.4	17.3	17.8	15.7	14.9
1/10/2007	2/5/2007	3/1/2007	4/1/2007	5/1/2007	6/1/2007	7/1/2007	8/1/2007	9/1/2007	10/5/2007	11/5/2007	12/18/2007
13.6	11.1	12.9	12.5	11.7	12.9	13.5	9.1	10.3	10.4	11.6	10.8
1/1/2008	2/1/2008	3/1/2008	4/1/2008	5/1/2008	6/1/2008	7/1/2008	8/1/2008	9/1/2008	10/1/2008	11/1/2008	12/1/2008
9.7	9.7	10.3	10.7		13.9	14.7	15.9	15.8	16.4	15.9	16.3
1/1/2009	2/1/2009	3/1/2009	4/1/2009	5/1/2009	6/1/2009	7/1/2009	8/1/2009	9/1/2009	10/1/2009	11/1/2009	12/1/2009
16.9	17.5	15.8	15.5	15.6	17	17.4	17.1	18.3	17.5	16.4	16.1
1/1/2010	2/1/2010	3/1/2010	4/1/2010	5/1/2010	6/1/2010	7/1/2010	8/1/2010	9/1/2010	10/1/2010	11/1/2010	12/1/2010
16.1	16.3	15.8	15.4	16.1	16.6	16.4	16.7	16.9	16.2	14.9	14.7
1/1/2011	2/1/2011	3/1/2011	4/1/2011	5/1/2011	6/1/2011	7/1/2011	8/1/2011	9/1/2011	10/1/2011	11/1/2011	12/1/2011
14.8	15.2	15.2	15.8	16.6	17.5	18.2	18.5	18.8	18.5	16.9	15.8
1/1/2012	2/1/2012	3/1/2012	4/1/2012	5/1/2012	6/1/2012	7/1/2012	8/1/2012	9/1/2012	10/1/2012	11/1/2012	12/1/2012
15.5	15.4	15.3	15.8	16.2	16.5	16.8	16.7	16.9	17.1	16.7	16.4
1/1/2013	2/1/2013	3/1/2013	4/1/2013	5/1/2013	6/1/2013	7/1/2013	8/1/2013	9/1/2013	10/1/2013	11/1/2013	12/1/2013
15.9	16.2	16.1	15.9	16.3	16.8	18.4	17.5	18.2	17.6	17	16.9
1/1/2014	2/1/2014	3/1/2014	4/1/2014	5/1/2014	6/1/2014	7/1/2014	8/1/2014	9/1/2014	10/1/2014	11/1/2014	12/1/2014
18.2	17.7	16.9	16.5	16.9	16.9	17.9	18.5	19.4	18.2	18.1	17.9
1/1/2015	2/1/2015	3/1/2015	4/1/2015	5/1/2015	6/1/2015	7/1/2015	8/1/2015	9/1/2015	10/1/2015	11/1/2015	12/1/2015
17.9	17.4	16.9	16.8	16.8	16.5	16.9	17.9	18.8	18.4	18.3	17.5
1/1/2016	2/1/2016	3/1/2016	4/1/2016	5/1/2016	6/1/2016	7/1/2016	8/1/2016	9/1/2016	10/1/2016	11/1/2016	12/1/2016
17.4	17.6	16.8	16.5	16.5	17.5	17.4	17.8	16.9	16.8	17.4	16.8
1/1/2017	2/1/2017	3/1/2017	4/1/2017	5/1/2017	6/1/2017	7/1/2017	8/1/2017	9/1/2017	10/1/2017	11/1/2017	12/1/2017
16.5	16.9	17	17.2	18.5	18.5	18.3	18.4	18.1	17.8	17.4	16.9
1/1/2018	2/1/2018	3/1/2018	4/1/2018	5/1/2018	6/1/2018	7/1/2018	8/1/2018	9/1/2018	10/1/2018	11/1/2018	12/1/2018
16.3	16.3	16.5	16.9	17.8	18.3	18.6	18.8	18.5	18.1	17.5	

Bill Hudgins well 2-1 16 442 157-442

9(deg) 26(min) 50.9(sec)

6(deg) 6(min) 52.77(sec)

Vell Grid: 66-40-4

			1-Mar	4-Apr-05	5/2/2005	6/2/2005	7/2/2005	8/2/2005	9/1/2005	10/4/2005	11/3/2005	12/1/2005
			38.1	37.9	38.2	47.6	64	55.9	49.1	51.5	46.9	44.4
1/5/2006	2/5/2006	3/1/2006	4/1/2006	5/1/2006	6/1/2006	7/1/2006	8/1/2006	9/1/2006	10/5/2006	11/5/2006	12/5/2006	
41.9	40.6	40.1	40.1	38.1	48.1	49.4	48.5	47.5	46.2	42.7	41.8	
1/10/2007	2/5/2007	3/1/2007	4/1/2007	5/1/2007	6/1/2007	7/1/2007	8/1/2007	9/1/2007	10/5/2007	11/5/2007	12/18/2007	
40.6	39.1	38.9	38.2	37.7	39.4	42.7	42.2	39.9	40.9	39.6	37.7	
1/1/2008	2/1/2008	3/1/2008	4/1/2008	5/1/2008	6/1/2008	7/1/2008	8/1/2008	9/1/2008	10/1/2008	11/1/2008	12/1/2008	
37.2	36.5	36.2	36		46.6	52.8	49.1	46.1	47.8	44.9	42.9	
1/1/2009	2/1/2009	3/1/2009	4/1/2009	5/1/2009	6/1/2009	7/1/2009	8/1/2009	9/1/2009	10/1/2009	11/1/2009	12/1/2009	
41.1	40.5	40.4	39.1	38.7	49.4	56.4	59.5	53.2	50.6	47.3	45.1	
1/1/2010	2/1/2010	3/1/2010	4/1/2010	5/1/2010	6/1/2010	7/1/2010	8/1/2010	9/1/2010	10/1/2010	11/1/2010	12/1/2010	
42.7	41	40.5	40.3	45.2	49.8	51.2	49.7	51.9	50.9	48.2	44.9	
1/1/2011	2/1/2011	3/1/2011	4/1/2011	5/1/2011	6/1/2011	7/1/2011	8/1/2011	9/1/2011	10/1/2011	11/1/2011	12/1/2011	
41.5	41.8	41.6	43	48.4	54	60.9	63.5	63.6	65.1	58	51.7	
1/1/2012	2/1/2012	3/1/2012	4/1/2012	5/1/2012	6/1/2012	7/1/2012	8/1/2012	9/1/2012	10/1/2012	11/1/2012	12/1/2012	
47.9	45.9	44.4	43.1	44.3	54.2	54.6	55.6	58.4	58.4	54.8	52.4	
1/1/2013	2/1/2013	3/1/2013	4/1/2013	5/1/2013	6/1/2013	7/1/2013	8/1/2013	9/1/2013	10/1/2013	11/1/2013	12/1/2013	
48.4	46.2	45.8	45.1	45.4	50.3	58.8	66.8	66.1	65.3	56.6	52.3	
1/1/2014	2/1/2014	3/1/2014	4/1/2014	5/1/2014	6/1/2014	7/1/2014	8/1/2014	9/1/2014	10/1/2014	11/1/2014	12/1/2014	
49.5	48	46.3	45.2	50.3	52.1	58.5	67.9	67.1	62.5	61.5	56	
1/1/2015	2/1/2015	3/1/2015	4/1/2015	5/1/2015	6/1/2015	7/1/2015	8/1/2015	9/1/2015	10/1/2015	11/1/2015	12/1/2015	
52.1	49.1	46.9	47.3	45.4	47.9	51.2	63.5	63.3	64	59.9	53.5	
1/1/2016	2/1/2016	3/1/2016	4/1/2016	5/1/2016	6/1/2016	7/1/2016	8/1/2016	9/1/2016	10/1/2016	11/1/2016	12/1/2016	
51.5	48.4	48.5	46.2	45.7	47.1	50.6	55.5	53.1	54	54	52.3	
1/1/2017	2/1/2017	3/1/2017	4/1/2017	5/1/2017	6/1/2017	7/1/2017	8/1/2017	9/1/2017	10/1/2017	11/1/2017	12/1/2017	
47.8	46	45.2	45	45.8	50.4	53.5	55.3	53.7	52.4	51.4	47.9	
1/1/2018	2/1/2018	3/1/2018	4/1/2018	5/1/2018	6/1/2018	7/1/2018	8/1/2018	9/1/2018	10/1/2018	11/1/2018	12/1/2018	
46	44.5	44.1	43.5	43.7	52.2	57.9	60.6	56.6	57.3	52.3		

East Bernard HWY 60 well 2-4 12
9(deg) 27(min) 38(sec)
6(deg) 4(min) 40(sec)
Vell Grid: 66-40-5

		1-Mar	4-Apr-05	5/2/2005	6/2/2005	7/2/2005	8/2/2005	9/1/2005	10/4/2005	11/3/2005	12/1/2005
							46.9	42.7	42.5	40.3	38.8
1/5/2006	2/5/2006	3/1/2006	4/1/2006	5/1/2006	6/1/2006	7/1/2006	8/1/2006	9/1/2006	10/5/2006	11/5/2006	12/5/2006
37.6	36	37.5	36.5	39.5	42.5	41.7	40.6	40.2	40.4	36.7	36.4
1/10/2007	2/5/2007	3/1/2007	4/1/2007	5/1/2007	6/1/2007	7/1/2007	8/1/2007	9/1/2007	10/5/2007	11/5/2007	12/18/2007
35.1	34.6	34.4	33.9	33.6	34.2	35.6	35.4	34.5	35.2	35.1	33.6
1/1/2008	2/1/2008	3/1/2008	4/1/2008	5/1/2008	6/1/2008	7/1/2008	8/1/2008	9/1/2008	10/1/2008	11/1/2008	12/1/2008
33.8	33	32.7	32.5		39.5	42.8	40.1	39.1	41.2	38.3	37.4
1/1/2009	2/1/2009	3/1/2009	4/1/2009	5/1/2009	6/1/2009	7/1/2009	8/1/2009	9/1/2009	10/1/2009	11/1/2009	12/1/2009
36.2	36.6	36.6	36.1	35.1	41.6	45	46.1	41.4	40.1	38.5	37.8
1/1/2010	2/1/2010	3/1/2010	4/1/2010	5/1/2010	6/1/2010	7/1/2010	8/1/2010	9/1/2010	10/1/2010	11/1/2010	12/1/2010
36.4	34.4	34.5	34.1	37.6	39.1	39.5	39.7	40.9	39.7	38.4	36.9
1/1/2011	2/1/2011	3/1/2011	4/1/2011	5/1/2011	6/1/2011	7/1/2011	8/1/2011	9/1/2011	10/1/2011	11/1/2011	12/1/2011
36.8	35.8	35.9	36.6	40.5	43.5	45.4	48.7	48.6	48.5	44.2	41.5
1/1/2012	2/1/2012	3/1/2012	4/1/2012	5/1/2012	6/1/2012	7/1/2012	8/1/2012	9/1/2012	10/1/2012	11/1/2012	12/1/2012
39.1	37.5	35.5	34	34	41.8	41.3	42	42.8	41.8	41.2	40.2
1/1/2013	2/1/2013	3/1/2013	4/1/2013	5/1/2013	6/1/2013	7/1/2013	8/1/2013	9/1/2013	10/1/2013	11/1/2013	12/1/2013
38.5	37.6	37.2	37.1	36.9	41.7	44.6	48.8	46.2	45.1	43.1	40.6
1/1/2014	2/1/2014	3/1/2014	4/1/2014	5/1/2014	6/1/2014	7/1/2014	8/1/2014	9/1/2014	10/1/2014	11/1/2014	12/1/2014
39.6	38.8	38.4	37.8	38.2	40	43.5	49.1	46.7	46.5	44.5	42.6
1/1/2015	2/1/2015	3/1/2015	4/1/2015	5/1/2015	6/1/2015	7/1/2015	8/1/2015	9/1/2015	10/1/2015	11/1/2015	12/1/2015
41.4	40.1	40.1	39.5	38.1	38.5	39.6	46.3	43.1	43.3	42.5	40.6
1/1/2016	2/1/2016	3/1/2016	4/1/2016	5/1/2016	6/1/2016	7/1/2016	8/1/2016	9/1/2016	10/1/2016	11/1/2016	12/1/2016
39.5	39	38.6	37.6	37	36.5	40	40.9	41.1	40.4	40.2	39.6
1/1/2017	2/1/2017	3/1/2017	4/1/2017	5/1/2017	6/1/2017	7/1/2017	8/1/2017	9/1/2017	10/1/2017	11/1/2017	12/1/2017
38.4	37.3	37.3	37.1	37.8	38.2	40.5	41.7	41.2	40.8	40.1	39
1/1/2018	2/1/2018	3/1/2018	4/1/2018	5/1/2018	6/1/2018	7/1/2018	8/1/2018	9/1/2018	10/1/2018	11/1/2018	12/1/2018
38.1	37	37	37.3	37.4	41.5	42.6	42.5	41.5	41.1	40.8	

)ick Ramsey Well 3-6
'9(deg) 5(min) 6.04(sec)
)6(deg) 16(min) 15(sec)
Vell Grid: 66-62-3

1/1/2009	2/1/2009	3/1/2009	4/1/2009	5/1/2009	6/1/2009	7/1/2009	8/1/2009	9/1/2009	10/1/2009	11/1/2009	12/1/2009
						45.1	43.7	41.5	39.4	38.1	36.7
1/1/2010	2/1/2010	3/1/2010	4/1/2010	5/1/2010	6/1/2010	7/1/2010	8/1/2010	9/1/2010	10/1/2010	11/1/2010	12/1/2010
34.8	35.6	35.3	35.2	37.2	37.1	37.5	37.4	37.1	36.2	36.1	35.7
1/1/2011	2/1/2011	3/1/2011	4/1/2011	5/1/2011	6/1/2011	7/1/2011	8/1/2011	9/1/2011	10/1/2011	11/1/2011	12/1/2011
35.1	34.3	34.6	37	38.1	40.1	42.2	40.8	40.2	38.6	36.6	37.1
1/1/2012	2/1/2012	3/1/2012	4/1/2012	5/1/2012	6/1/2012	7/1/2012	8/1/2012	9/1/2012	10/1/2012	11/1/2012	12/1/2012
36.4	36.2	35.6	35.2	35.2	36.2	38.8	38	37.5	37.2	36.5	36.3
1/1/2013	2/1/2013	3/1/2013	4/1/2013	5/1/2013	6/1/2013	7/1/2013	8/1/2013	9/1/2013	10/1/2013	11/1/2013	12/1/2013
36	35.4	35.3	35.7	36.1	38.1	38.8	38.1	37.5	37.2	36.8	36.3
1/1/2014	2/1/2014	3/1/2014	4/1/2014	5/1/2014	6/1/2014	7/1/2014	8/1/2014	9/1/2014	10/1/2014	11/1/2014	12/1/2014
36.1	35.7	35.6	35.5	36.6	37.2	38.7	38.4	38.2	37.5	36.9	36.8
1/1/2015	2/1/2015	3/1/2015	4/1/2015	5/1/2015	6/1/2015	7/1/2015	8/1/2015	9/1/2015	10/1/2015	11/1/2015	12/1/2015
36.6	36.1	35.8	35.8	35.5	36.8	37.1	37.3	37.8	36.7	36.8	35.6
1/1/2016	2/1/2016	3/1/2016	4/1/2016	5/1/2016	6/1/2016	7/1/2016	8/1/2016	9/1/2016	10/1/2016	11/1/2016	12/1/2016
35.5	35.3	35.3	34.9	35.8	35.5	36.4	36.8	37.1	36.5	35.6	35.5
1/1/2017	2/1/2017	3/1/2017	4/1/2017	5/1/2017	6/1/2017	7/1/2017	8/1/2017	9/1/2017	10/1/2017	11/1/2017	12/1/2017
35.5	35.1	34.8	34.8	35.3	35.8	36.2	36.5	36.7	36.4	35.8	35.9
1/1/2018	2/1/2018	3/1/2018	4/1/2018	5/1/2018	6/1/2018	7/1/2018	8/1/2018	9/1/2018	10/1/2018	11/1/2018	12/1/2018
35.3	34.7	34.2	34.5	35.1	36.5	36.6	37.1	36.5	36.1	35.6	

'ierce Ranch #1 fenced well 4-3 4 100

9(deg) 12(min) 9.24(sec)

6(deg) 8(min) 38.15(sec)

Vell Grid: 66-55-6

		1-Mar	4-Apr-05	5/2/2005	6/2/2005	7/2/2005	8/2/2005	9/1/2005	10/4/2005	11/3/2005	12/1/2005
		11.2	11.6	11.9	12.1	11.7	11.9	12.4	12.6	13	12.7
1/5/2006	2/5/2006	3/1/2006	4/1/2006	5/1/2006	6/1/2006	7/1/2006	8/1/2006	9/1/2006	10/5/2006	11/5/2006	12/5/2006
12.1	14.4	14.9	14.6	15.1	15	15.85	16	16.2	16.2	15.6	15.4
1/10/2007	2/5/2007	3/1/2007	4/1/2007	5/1/2007	6/1/2007	7/1/2007	8/1/2007	9/1/2007	10/5/2007	11/5/2007	12/18/2007
14.8	14.2	14.9	14.1	13.9	14.6	14.8	11.9	12.2	12.8	12.5	12.5
1/1/2008	2/1/2008	3/1/2008	4/1/2008	5/1/2008	6/1/2008	7/1/2008	8/1/2008	9/1/2008	10/1/2008	11/1/2008	12/1/2008
12.4	12.4	12.6	12.9		13.2	13.1	13.2	13.9	14.2	14.3	14.5
1/1/2009	2/1/2009	3/1/2009	4/1/2009	5/1/2009	6/1/2009	7/1/2009	8/1/2009	9/1/2009	10/1/2009	11/1/2009	12/1/2009
14.6	14.6	14.9	15.5	15.6	15.8	16.3	16.2	16.3	16.1	15.9	15.5
1/1/2010	2/1/2010	3/1/2010	4/1/2010	5/1/2010	6/1/2010	7/1/2010	8/1/2010	9/1/2010	10/1/2010	11/1/2010	12/1/2010
14.9	14.5	14.3	15.1	15.5	15.4	15.5	15.1	15.6	15.2	14.5	14.9
1/1/2011	2/1/2011	3/1/2011	4/1/2011	5/1/2011	6/1/2011	7/1/2011	8/1/2011	9/1/2011	10/1/2011	11/1/2011	12/1/2011
14.3	14.3	15.1	15.3	16.2	16.3	15.6	14.9	15.3	14.5	14.9	14.9
1/1/2012	2/1/2012	3/1/2012	4/1/2012	5/1/2012	6/1/2012	7/1/2012	8/1/2012	9/1/2012	10/1/2012	11/1/2012	12/1/2012
14.8	14.9	14.6	14.8	15.1	15.3	15.4	15.1	14.9	14.3	14.5	14.3
1/1/2013	2/1/2013	3/1/2013	4/1/2013	5/1/2013	6/1/2013	7/1/2013	8/1/2013	9/1/2013	10/1/2013	11/1/2013	12/1/2013
14.5	14.3	15.7	16.8	17.4	17.6	18.4	17.8	18.6	18.2	17.2	17.1
1/1/2014	2/1/2014	3/1/2014	4/1/2014	5/1/2014	6/1/2014	7/1/2014	8/1/2014	9/1/2014	10/1/2014	11/1/2014	12/1/2014
17.5	17.6	16.8	16.8	17.8	18.2	19.2	19.3	19.5	19.6	18.5	18.2
1/1/2015	2/1/2015	3/1/2015	4/1/2015	5/1/2015	6/1/2015	7/1/2015	8/1/2015	9/1/2015	10/1/2015	11/1/2015	12/1/2015
18	17.9	17.2	17.8	18.2	18.3	18.4	18.5	18.6	18.7	18.1	16.7
1/1/2016	2/1/2016	3/1/2016	4/1/2016	5/1/2016	6/1/2016	7/1/2016	8/1/2016	9/1/2016	10/1/2016	11/1/2016	12/1/2016
16	15.8	16.7	17.2	17.6	17.5	18.5	18.3	18	17.8	17.9	16.8
1/1/2017	2/1/2017	3/1/2017	4/1/2017	5/1/2017	6/1/2017	7/1/2017	8/1/2017	9/1/2017	10/1/2017	11/1/2017	12/1/2017
16.4	15.4	16.4	17	17.5	18.3	18.4	18.2	18.1	18.4	17.8	16.5
1/1/2018	2/1/2018	3/1/2018	4/1/2018	5/1/2018	6/1/2018	7/1/2018	8/1/2018	9/1/2018	10/1/2018	11/1/2018	12/1/2018
15.8	15.4	14.9	15.3	16.2	17.8	18.6	18.5	17.8	17.5	18.1	

Pierce Ranch #2 well 4-4	4	275
9(deg) 10(min) 27(sec)		
6(deg) 7(min) 20(sec)		
Well Grid: 66-56-4		

		1-Mar	4-Apr-05	5/2/2005	6/2/2005	7/2/2005	8/2/2005	9/1/2005	10/4/2005	11/3/2005	12/1/2005
		45.6	46	49.6	53.1	65	65.9	63.8	64.3	62.9	63.7
1/5/2006	2/5/2006	3/1/2006	4/1/2006	5/1/2006	6/1/2006	7/1/2006	8/1/2006	9/1/2006	10/5/2006	11/5/2006	12/5/2006
58.7	55.4	52.8	55.7	57.1	64	64.75	63.5	63.5	63.6	59.5	61.1
1/10/2007	2/5/2007	3/1/2007	4/1/2007	5/1/2007	6/1/2007	7/1/2007	8/1/2007	9/1/2007	10/5/2007	11/5/2007	12/18/2007
56.6	52.6	50.2	48.8	48.2	50.6	56.2	50.8	51.2	52.3	52.5	52.3
1/1/2008	2/1/2008	3/1/2008	4/1/2008	5/1/2008	6/1/2008	7/1/2008	8/1/2008	9/1/2008	10/1/2008	11/1/2008	12/1/2008
50.1	48.2	47.9	45.3		56.4	56.4	67.9	64.3	63.9	61.7	58.6
1/1/2009	2/1/2009	3/1/2009	4/1/2009	5/1/2009	6/1/2009	7/1/2009	8/1/2009	9/1/2009	10/1/2009	11/1/2009	12/1/2009
55	54.9	52.5	50.7	52.1	62.2	72.2	75.3	75.4	69.9	63.5	59.7
1/1/2010	2/1/2010	3/1/2010	4/1/2010	5/1/2010	6/1/2010	7/1/2010	8/1/2010	9/1/2010	10/1/2010	11/1/2010	12/1/2010
56.4	52.7	50.9	48.6	54.3	58.2	59.1	56.9	58.1	56.9	55.2	55.4
1/1/2011	2/1/2011	3/1/2011	4/1/2011	5/1/2011	6/1/2011	7/1/2011	8/1/2011	9/1/2011	10/1/2011	11/1/2011	12/1/2011
55.1	52.2	50.8	53.5	56.3	61.7	66.6	69.8	72.7	70.9	66.8	65.7
1/1/2012	2/1/2012	3/1/2012	4/1/2012	5/1/2012	6/1/2012	7/1/2012	8/1/2012	9/1/2012	10/1/2012	11/1/2012	12/1/2012
60.2	58.3	54.1	52.5	52.1	56.2	63.4	63.9	66.3	66.4	64.7	61
1/1/2013	2/1/2013	3/1/2013	4/1/2013	5/1/2013	6/1/2013	7/1/2013	8/1/2013	9/1/2013	10/1/2013	11/1/2013	12/1/2013
61.4	57.4	56.5	56.1	55.5	57.7	66.6	70.7	74.1	73.1	69.6	65.1
1/1/2014	2/1/2014	3/1/2014	4/1/2014	5/1/2014	6/1/2014	7/1/2014	8/1/2014	9/1/2014	10/1/2014	11/1/2014	12/1/2014
60.3	57.7	55.2	53.4	54.1	56.7	61.8	66.2	69.2	69.2	66.5	63.4
1/1/2015	2/1/2015	3/1/2015	4/1/2015	5/1/2015	6/1/2015	7/1/2015	8/1/2015	9/1/2015	10/1/2015	11/1/2015	12/1/2015
60.7	56.8	54.2	52.4	50.8	49.3	49.1	51.5	56.9	57.5	59.5	55.1
1/1/2016	2/1/2016	3/1/2016	4/1/2016	5/1/2016	6/1/2016	7/1/2016	8/1/2016	9/1/2016	10/1/2016	11/1/2016	12/1/2016
53.7	50.7	49.8	49.3	48.8	48.1	50	55.4	54.5	54	56	55.8
1/1/2017	2/1/2017	3/1/2017	4/1/2017	5/1/2017	6/1/2017	7/1/2017	8/1/2017	9/1/2017	10/1/2017	11/1/2017	12/1/2017
55.1	50.3	48.9	47.7	47.1	50.2	52.1	55.2	54.1	53.1	54.4	56.1
1/1/2018	2/1/2018	3/1/2018	4/1/2018	5/1/2018	6/1/2018	7/1/2018	8/1/2018	9/1/2018	10/1/2018	11/1/2018	12/1/2018
53.3	50.2	48.1	47.1	46.8	52.8	57.8	62.4	65.4	62.1	61.8	

Tractor Tire Danevang well 3-1	18	398 252-398			1-Mar	4-Apr-05	5/2/2005	6/2/2005	7/2/2005	8/2/2005	9/1/2005	10/4/2005	11/3/2005	12/1/2005
9(deg) 1(min) 8.22(sec)					23	23.1	23.3	25.2	31.2	30.8	30.9	31	30.7	28.5
6(deg) 18(min) 24.96(sec)			1/5/2006	2/5/2006	3/1/2006	4/1/2006	5/1/2006	6/1/2006	7/1/2006	8/1/2006	9/1/2006	10/5/2006	11/5/2006	12/5/2006
Well Grid: 66-62-8			28.1	27.8	29.6	27.6	29.1	31.5	31.21	29.4	29.1	28.7	27.1	26.8
			1/10/2007	2/5/2007	3/1/2007	4/1/2007	5/1/2007	6/1/2007	7/1/2007	8/1/2007	9/1/2007	10/5/2007	11/5/2007	12/18/2007
			25.9	23.6	23.6	22.9	23	23.2	23.7	21.1	20.9	21.5	21.8	21.9
			1/1/2008	2/1/2008	3/1/2008	4/1/2008	5/1/2008	6/1/2008	7/1/2008	8/1/2008	9/1/2008	10/1/2008	11/1/2008	12/1/2008
			21.5	21.3	21.2	20.9		24.5	27.1	28.1	27.6	27.2	26.5	25.7
			1/1/2009	2/1/2009	3/1/2009	4/1/2009	5/1/2009	6/1/2009	7/1/2009	8/1/2009	9/1/2009	10/1/2009	11/1/2009	12/1/2009
			25.2	25.4	25.5	25.7	26.5	31.7	35.2	36.1	38.6	36.2	32.1	29.1
			1/1/2010	2/1/2010	3/1/2010	4/1/2010	5/1/2010	6/1/2010	7/1/2010	8/1/2010	9/1/2010	10/1/2010	11/1/2010	12/1/2010
			26.6	25.2	24.3	24.1	25.5	26.6	25.7	25.7	26.4	25.2	25.3	25.3
			1/1/2011	2/1/2011	3/1/2011	4/1/2011	5/1/2011	6/1/2011	7/1/2011	8/1/2011	9/1/2011	10/1/2011	11/1/2011	12/1/2011
			24.9	24	23.9	24.5	26.5	27.9	29.8	31.5	32.3	32.4	32	31.8
			1/1/2012	2/1/2012	3/1/2012	4/1/2012	5/1/2012	6/1/2012	7/1/2012	8/1/2012	9/1/2012	10/1/2012	11/1/2012	12/1/2012
			31.1	30.9	30.2	28.9	28.7	30.9	32.3	31.1	30.5	29.5	29.1	29.1
			1/1/2013	2/1/2013	3/1/2013	4/1/2013	5/1/2013	6/1/2013	7/1/2013	8/1/2013	9/1/2013	10/1/2013	11/1/2013	12/1/2013
			28.9	27.4	26.9	27.4	28.2	30.3	34.5	33.2	32.4	31.8	31.1	29.6
			1/1/2014	2/1/2014	3/1/2014	4/1/2014	5/1/2014	6/1/2014	7/1/2014	8/1/2014	9/1/2014	10/1/2014	11/1/2014	12/1/2014
			28.8	28.7	29	29.1	30.3	31.7	34.7	36.5	35.2	34.6	33.5	32.8
			1/1/2015	2/1/2015	3/1/2015	4/1/2015	5/1/2015	6/1/2015	7/1/2015	8/1/2015	9/1/2015	10/1/2015	11/1/2015	12/1/2015
			31.8	30.6	29.2	28.5	27.1	26.5	26.2	28.8	29.3	29.2	27.8	26.6
			1/1/2016	2/1/2016	3/1/2016	4/1/2016	5/1/2016	6/1/2016	7/1/2016	8/1/2016	9/1/2016	10/1/2016	11/1/2016	12/1/2016
			26.6	26.2	26.2	25.1	24.8	24.9	25.2	28.9	24.8	24.3	24.5	24.1
			1/1/2017	2/1/2017	3/1/2017	4/1/2017	5/1/2017	6/1/2017	7/1/2017	8/1/2017	9/1/2017	10/1/2017	11/1/2017	12/1/2017
Estimated by monthly change after			23.7	23.7	24.3	25.1	23.5	27.6	36.4	33.9	26.2	26.5	23.8	20.9
Well was originally used for spray tanks				33.5	34.1	34.9	33.3	37.4	46.2	43.7	36	36.3	33.6	30.7
						well nearby		45.9	50.4	50.2	45.2	46.3	45.1	42.9
GCD Board chose to replace Tractor			1/1/2018	2/1/2018	3/1/2018	4/1/2018	5/1/2018	6/1/2018	7/1/2018	8/1/2018	9/1/2018	10/1/2018	11/1/2018	12/1/2018
Tire Danevang well with Nearby well			19.6	18.1	17.6	16.6								
measurements to use into the			29.4	27.9	27.2	26.2								
Index average from 6/1/2017 on			41.6	40.3	40.2	39.6	40.5	49.8	52.5	57	54.1	46.3	43.9	

Monzer #4 well 3-3 18

9(deg) 11(min) 9.38(sec)

6(deg) 29(min) 58.9(sec)

Well Grid: 66-53-4

		1-Mar	4-Apr-05	5/2/2005	6/2/2005	7/2/2005	8/2/2005	9/1/2005	10/4/2005	11/3/2005	12/1/2005
1/5/2006	2/5/2006	3/1/2006	4/1/2006	5/1/2006	6/1/2006	7/1/2006	8/1/2006	9/1/2006	10/5/2006	11/5/2006	12/5/2006
1/10/2007	2/5/2007	3/1/2007	4/1/2007	5/1/2007	6/1/2007	7/1/2007	8/1/2007	9/1/2007	10/5/2007	11/5/2007	12/18/2007
1/1/2008	2/1/2008	3/1/2008	4/1/2008	5/1/2008	6/1/2008	7/1/2008	8/1/2008	9/1/2008	10/1/2008	11/1/2008	12/1/2008
1/1/2009	2/1/2009	3/1/2009	4/1/2009	5/1/2009	6/1/2009	7/1/2009	8/1/2009	9/1/2009	10/1/2009	11/1/2009	12/1/2009
					63.8	66.5	66.3	66.5	65.3	64.4	63.7
1/1/2010	2/1/2010	3/1/2010	4/1/2010	5/1/2010	6/1/2010	7/1/2010	8/1/2010	9/1/2010	10/1/2010	11/1/2010	12/1/2010
63.3	62.6	62.5	61.8	62.3	62.3	64.3	64.5	64.9	64.4	63.8	63.5
1/1/2011	2/1/2011	3/1/2011	4/1/2011	5/1/2011	6/1/2011	7/1/2011	8/1/2011	9/1/2011	10/1/2011	11/1/2011	12/1/2011
63.1	62.1	60.8	62.5	64.4	65.6	67.1	68.2	69.1	69.3	68.3	67.7
1/1/2012	2/1/2012	3/1/2012	4/1/2012	5/1/2012	6/1/2012	7/1/2012	8/1/2012	9/1/2012	10/1/2012	11/1/2012	12/1/2012
66.8	66.2	65	64.6	65	67.4	68.7	69.3	69.6	69.4	68.7	68.4
1/1/2013	2/1/2013	3/1/2013	4/1/2013	5/1/2013	6/1/2013	7/1/2013	8/1/2013	9/1/2013	10/1/2013	11/1/2013	12/1/2013
67.6	66.7	65.7	65.4	65.4	67.7	69.5	70.1	71.3	71.1	70.3	69.5
1/1/2014	2/1/2014	3/1/2014	4/1/2014	5/1/2014	6/1/2014	7/1/2014	8/1/2014	9/1/2014	10/1/2014	11/1/2014	12/1/2014
68.7	67.3	66.1	65.7	66.3	66.7	68.7	70.3	70.5	69.9	69.5	68.7
1/1/2015	2/1/2015	3/1/2015	4/1/2015	5/1/2015	6/1/2015	7/1/2015	8/1/2015	9/1/2015	10/1/2015	11/1/2015	12/1/2015
67.9	66.8	66.2	65.3	64.9	65.7	67.7	68.9	68.7	69.3	68.4	67.6
1/1/2016	2/1/2016	3/1/2016	4/1/2016	5/1/2016	6/1/2016	7/1/2016	8/1/2016	9/1/2016	10/1/2016	11/1/2016	12/1/2016
66.6	65.6	64.7	64.7	64.9	65.5	67.4	67.1	67.2	67.2	66.7	65.5
1/1/2017	2/1/2017	3/1/2017	4/1/2017	5/1/2017	6/1/2017	7/1/2017	8/1/2017	9/1/2017	10/1/2017	11/1/2017	12/1/2017
64.7	63.7	62.8	62.1	63.5	65.1	67.1	66.8	67.1	66.5	65.5	64.7
1/1/2018	2/1/2018	3/1/2018	4/1/2018	5/1/2018	6/1/2018	7/1/2018	8/1/2018	9/1/2018	10/1/2018	11/1/2018	12/1/2018
63.8	62.7	61.8	61.3	61.4	65.8	67.1	67.5	67	66.5	65.8	

Ilke Ryan well 3-4 16

9(deg) 19(min) 48.33(sec)

6(deg) 24(min) 8.73(sec)

Vell Grid: 66-45-6

		1-Mar	4-Apr-05	5/2/2005	6/2/2005	7/2/2005	8/2/2005	9/1/2005	10/4/2005	11/3/2005	12/1/2005
		50.9	68.2	58.9	59.6	*93.1	84.9	65.5	65.7	57.5	53.3
1/5/2006	2/5/2006	3/1/2006	4/1/2006	5/1/2006	6/1/2006	7/1/2006	8/1/2006	9/1/2006	10/5/2006	11/5/2006	12/5/2006
52.2	51	50.7	70.2	*83.8	63.6	*81.1	81.3	*86.3	54.6	52.5	51.3
1/10/2007	2/5/2007	3/1/2007	4/1/2007	5/1/2007	6/1/2007	7/1/2007	8/1/2007	9/1/2007	10/5/2007	11/5/2007	12/18/2007
50.3	49.5	49.5	48.6	*77.0	*81.1	57.4	*76.7	51.8	54.4	48.7	47.3
1/1/2008	2/1/2008	3/1/2008	4/1/2008	5/1/2008	6/1/2008	7/1/2008	8/1/2008	9/1/2008	10/1/2008	11/1/2008	12/1/2008
46.9	46.3	46	46		*86.1	63.3	*80.5	56.7	53.2	49.9	49
1/1/2009	2/1/2009	3/1/2009	4/1/2009	5/1/2009	6/1/2009	7/1/2009	8/1/2009	9/1/2009	10/1/2009	11/1/2009	12/1/2009
48.8	49.7	48.9	49.7	*77.5	*85.6	*88.5	*87.5	*82.7	59.1	53.3	50.9
1/1/2010	2/1/2010	3/1/2010	4/1/2010	5/1/2010	6/1/2010	7/1/2010	8/1/2010	9/1/2010	10/1/2010	11/1/2010	12/1/2010
49.6	48.3	48.2	47.8	58.1	62.5	54.8	58.1	63.3	*75.3	52.5	51.2
1/1/2011	2/1/2011	3/1/2011	4/1/2011	5/1/2011	6/1/2011	7/1/2011	8/1/2011	9/1/2011	10/1/2011	11/1/2011	12/1/2011
49.1	48.1	47.4	55.1	*75.9	*83.9	*84.9	*83.2	69.4	69.1	58.1	54.6
1/1/2012	2/1/2012	3/1/2012	4/1/2012	5/1/2012	6/1/2012	7/1/2012	8/1/2012	9/1/2012	10/1/2012	11/1/2012	12/1/2012
52.5	51.3	50.7	49.7	*74.7	*89.1	65.1	65.1	*85.1	58.5	54.2	53.6
1/1/2013	2/1/2013	3/1/2013	4/1/2013	5/1/2013	6/1/2013	7/1/2013	8/1/2013	9/1/2013	10/1/2013	11/1/2013	12/1/2013
51.5	50.8	50.2	50.3	51.2	58.9	65.5	61.7	62.4	58.5	54.5	52.8
1/1/2014	2/1/2014	3/1/2014	4/1/2014	5/1/2014	6/1/2014	7/1/2014	8/1/2014	9/1/2014	10/1/2014	11/1/2014	12/1/2014
52.2	51.1	50.7	50.2	53.6	53	62.3	57.3	59.2	57.4	55.2	52.7
1/1/2015	2/1/2015	3/1/2015	4/1/2015	5/1/2015	6/1/2015	7/1/2015	8/1/2015	9/1/2015	10/1/2015	11/1/2015	12/1/2015
52.2	50.8	50.2	49.8	49.9	52.8	54.1	56.3	56.8	56.9	54.7	51.8
1/1/2016	2/1/2016	3/1/2016	4/1/2016	5/1/2016	6/1/2016	7/1/2016	8/1/2016	9/1/2016	10/1/2016	11/1/2016	12/1/2016
48	47.8	47.9	46.9	47.8	47.8	51.8	54.2	54.1	53.8	52.8	50.6
1/1/2017	2/1/2017	3/1/2017	4/1/2017	5/1/2017	6/1/2017	7/1/2017	8/1/2017	9/1/2017	10/1/2017	11/1/2017	12/1/2017
48.14	47.3	46.6	45.8	46.3	46.5	49.5	52.3	49.5	50.2	49.8	48.8
1/1/2018	2/1/2018	3/1/2018	4/1/2018	5/1/2018	6/1/2018	7/1/2018	8/1/2018	9/1/2018	10/1/2018	11/1/2018	12/1/2018
48.2	47.5	46.5	46.3	47.9	56.8	61	57	55.5	52.7	51.4	

.ouise well 3-5	8	678	560-585			1-Mar	4-Apr-05	5/2/2005	6/2/2005	7/2/2005	8/2/2005	9/1/2005	10/4/2005	11/3/2005	12/1/2005
9(deg) 6(min) 31.69(sec)			595-635								77.4	72.3	67.9	64.1	65.2
6(deg) 24(min) 33.53(sec)			656-678	1/5/2006	2/5/2006	3/1/2006	4/1/2006	5/1/2006	6/1/2006	7/1/2006	8/1/2006	9/1/2006	10/5/2006	11/5/2006	12/5/2006
Vell Grid: 66-61-3				57.9		55.9	55		65	64.7	64.8	62.4	61.4	58.8	55.9
				1/10/2007	2/5/2007	3/1/2007	4/1/2007	5/1/2007	6/1/2007	7/1/2007	8/1/2007	9/1/2007	10/5/2007	11/5/2007	12/18/2007
				54.1	52.9	52.7	51.7	51.9	54.5	55.6	55.5	54.7	54.3	52.7	51.3
				1/1/2008	2/1/2008	3/1/2008	4/1/2008	5/1/2008	6/1/2008	7/1/2008	8/1/2008	9/1/2008	10/1/2008	11/1/2008	12/1/2008
				50.2	48.7	48.2	48.5		63.8	68.7	64.9	61.3	60.5	57.9	55.6
				1/1/2009	2/1/2009	3/1/2009	4/1/2009	5/1/2009	6/1/2009	7/1/2009	8/1/2009	9/1/2009	10/1/2009	11/1/2009	12/1/2009
				53.3	52.3	52.1	53.3	51.8	72.5	83.8	82.3	76.8	70.5	64.8	60.1
				1/1/2010	2/1/2010	3/1/2010	4/1/2010	5/1/2010	6/1/2010	7/1/2010	8/1/2010	9/1/2010	10/1/2010	11/1/2010	12/1/2010
				57.8	55.8	54.5	53.7	60.7	62.3	66.5	72.8	66.1	64.6	60.8	57.9
				1/1/2011	2/1/2011	3/1/2011	4/1/2011	5/1/2011	6/1/2011	7/1/2011	8/1/2011	9/1/2011	10/1/2011	11/1/2011	12/1/2011
				56.3	53.8	52.6	54.8	69.9	70.4	76.2	79.5	78.8	77.2	73.6	67.1
				1/1/2012	2/1/2012	3/1/2012	4/1/2012	5/1/2012	6/1/2012	7/1/2012	8/1/2012	9/1/2012	10/1/2012	11/1/2012	12/1/2012
				62.7	60.5	57.6	56.8	56.9	70.3	77.6	79.1	73.3	69.4	65.4	62.6
				1/1/2013	2/1/2013	3/1/2013	4/1/2013	5/1/2013	6/1/2013	7/1/2013	8/1/2013	9/1/2013	10/1/2013	11/1/2013	12/1/2013
				59.8	58.7	56.5	55.8	58.7	69.8	81.4	81.9	76.1	71.8	67.2	63.5
				1/1/2014	2/1/2014	3/1/2014	4/1/2014	5/1/2014	6/1/2014	7/1/2014	8/1/2014	9/1/2014	10/1/2014	11/1/2014	12/1/2014
				61.7	58.2	55.8	55.2	67	62.3	67.1	70.2	71.2	67.2	66.3	62.3
				1/1/2015	2/1/2015	3/1/2015	4/1/2015	5/1/2015	6/1/2015	7/1/2015	8/1/2015	9/1/2015	10/1/2015	11/1/2015	12/1/2015
				59.6	57.3	55.8	54.4	53.5	54.2	57.9	70.1	66.2	63.2	61.3	58.7
				1/1/2016	2/1/2016	3/1/2016	4/1/2016	5/1/2016	6/1/2016	7/1/2016	8/1/2016	9/1/2016	10/1/2016	11/1/2016	12/1/2016
				56.6	54.6	53.6	52.6	52.9	55.4	60.4	65.1	61.3	60.5	59.2	56.8
				1/1/2017	2/1/2017	3/1/2017	4/1/2017	5/1/2017	6/1/2017	7/1/2017	8/1/2017	9/1/2017	10/1/2017	11/1/2017	12/1/2017
				54.5	53.2	52.3	53.5	56.9	62.7	80.5	71	67.3	64.5	61.2	59
				1/1/2018	2/1/2018	3/1/2018	4/1/2018	5/1/2018	6/1/2018	7/1/2018	8/1/2018	9/1/2018	10/1/2018	11/1/2018	12/1/2018
				57.4	52	50.7	50	51.3	67.7	79.8	74.2	65.5	59.6	55.6	

Wintermann Jitney Rd. Well 2-2 20 698 240-400
WELL IN PRODUCTION) 400-698
:9(deg) 29(min) 23.16(sec)
)6(deg) 16(min) 5.53(sec)
Well Grid: 66-38-3

Wintermann well was used as an index well
nrough 6-1-15 and due to the well
eing back into production, it was no longer
t to serve as an index well.

			1-Mar	4-Apr-05	5/2/2005	6/2/2005	7/2/2005	8/2/2005	9/1/2005	10/4/2005	11/3/2005	12/1/2005
1/5/2006	2/5/2006	3/1/2006	4/1/2006	5/1/2006	6/1/2006	7/1/2006	8/1/2006	9/1/2006	10/5/2006	11/5/2006	12/5/2006	
54.6	51.8	53.4	55.6		57.4	50.5	50.9	50.7	49.4	47.4	46.8	
1/10/2007	2/5/2007	3/1/2007	4/1/2007	5/1/2007	6/1/2007	7/1/2007	8/1/2007	9/1/2007	10/5/2007	11/5/2007	12/18/2007	
45.5	44.4	43.8	43.3	42.3	45.5	44.9	43.5	42.4	46.8	48.2	41.1	
1/1/2008	2/1/2008	3/1/2008	4/1/2008	5/1/2008	6/1/2008	7/1/2008	8/1/2008	9/1/2008	10/1/2008	11/1/2008	12/1/2008	
41	40.1	39.8	39.3		49.9	60.2	49.5	49.2	48.8	48.3	47.3	
1/1/2009	2/1/2009	3/1/2009	4/1/2009	5/1/2009	6/1/2009	7/1/2009	8/1/2009	9/1/2009	10/1/2009	11/1/2009	12/1/2009	
46.6	46.1	45.7	44.7	44.5	57.1	60.9	59.3	56.7	54.5	52.4	49.6	
1/1/2010	2/1/2010	3/1/2010	4/1/2010	5/1/2010	6/1/2010	7/1/2010	8/1/2010	9/1/2010	10/1/2010	11/1/2010	12/1/2010	
48.1	46.7	46.1	45.2	47.3	56.4	54.8	54.1	56.1	54.1	52.5	51.2	
1/1/2011	2/1/2011	3/1/2011	4/1/2011	5/1/2011	6/1/2011	7/1/2011	8/1/2011	9/1/2011	10/1/2011	11/1/2011	12/1/2011	
50.5	48.2	47.3	48.8	56.8	63.3	73.1	68.8	87.5	71.3	63.3	63.6	
1/1/2012	2/1/2012	3/1/2012	4/1/2012	5/1/2012	6/1/2012	7/1/2012	8/1/2012	9/1/2012	10/1/2012	11/1/2012	12/1/2012	
56.1	54.2	52.4	51.1	52.7	71.4	71.5	70.3	76.5	69.6	71.4	62.7	
1/1/2013	2/1/2013	3/1/2013	4/1/2013	5/1/2013	6/1/2013	7/1/2013	8/1/2013	9/1/2013	10/1/2013	11/1/2013	12/1/2013	
59.2	56.8	53.7	53.3	54.8	73.1	98.1	86.4	96.2	82.2	72.1	70.2	
1/1/2014	2/1/2014	3/1/2014	4/1/2014	5/1/2014	6/1/2014	7/1/2014	8/1/2014	9/1/2014	10/1/2014	11/1/2014	12/1/2014	
55.8	50.6	49.4	48.4	74.4	77.5	94.1	116.2	116.2	96.4	93.5	75.6	
1/1/2015	2/1/2015	3/1/2015	4/1/2015	5/1/2015	6/1/2015	7/1/2015	8/1/2015	9/1/2015	10/1/2015	11/1/2015	12/1/2015	
67.4	62.4	59.7	57.1	55.6	65.1	104.2	*running*	*running*	*running*	89.9	no access	
1/1/2016	2/1/2016	3/1/2016	4/1/2016	5/1/2016	6/1/2016	7/1/2016	8/1/2016	9/1/2016	10/1/2016	11/1/2016	12/1/2016	
no access	no access	no access	no access									

ertson T2 Irrigation
/ell
9(deg) 29(min) 17(sec)
3(deg) 13(min) 16(sec)

Replaced Wintermann Jitney well
:ater level to be average with index wells
:arting 7-1-15

				4/1/2015	5/1/2015	6/1/2015	7/1/2015	8/1/2015	9/1/2015	10/1/2015	11/1/2015	12/1/2015
						58.1	67.7	69.6	69.5	68.2	77.5	66.7
1/1/2016	2/1/2016	3/1/2016	4/1/2016	5/1/2016	6/1/2016	7/1/2016	8/1/2016	9/1/2016	10/1/2016	11/1/2016	12/1/2016	
61.2	56.9	54.7	50.1	51.3	58.5	67	68.8	68.3	70	63.9	59.3	
1/1/2017	2/1/2017	3/1/2017	4/1/2017	5/1/2017	6/1/2017	7/1/2017	8/1/2017	9/1/2017	10/1/2017	11/1/2017	12/1/2017	
55.1	51.6	49.4	48.8	62.4	64.5	74.2	70	67.5	65.2	59.1	57.2	
1/1/2018	2/1/2018	3/1/2018	4/1/2018	5/1/2018	6/1/2018	7/1/2018	8/1/2018	9/1/2018	10/1/2018	11/1/2018	12/1/2018	
54.2	51.8	50	49.3	63	76.4	78.3	73.5	80.7	67.5	60.5		

Gertson Runway Well 2-3 20 450 need from Ronald

!9(deg) 35(min) 55(sec)

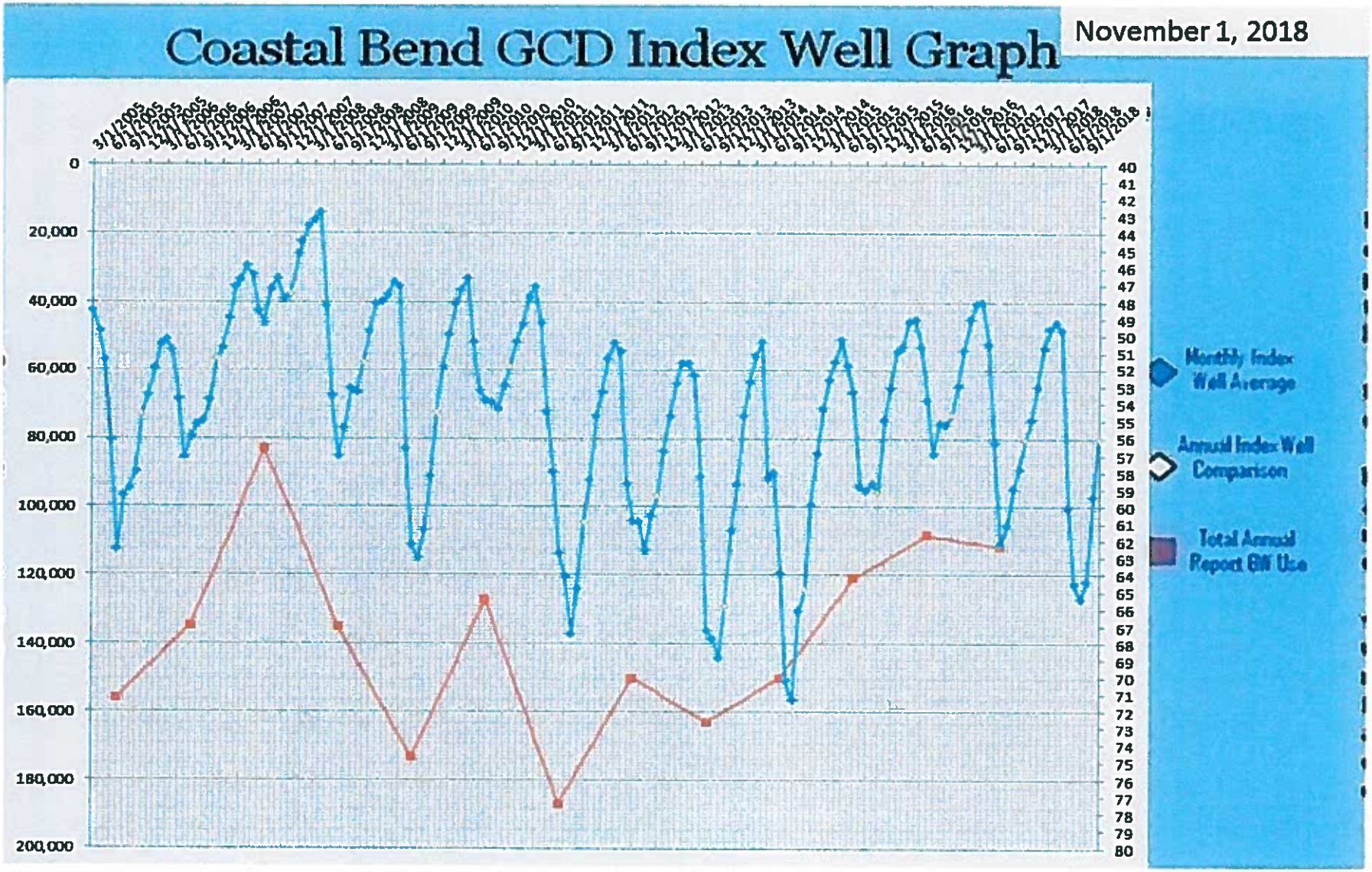
)6(deg) 12(min) 51.3(sec)

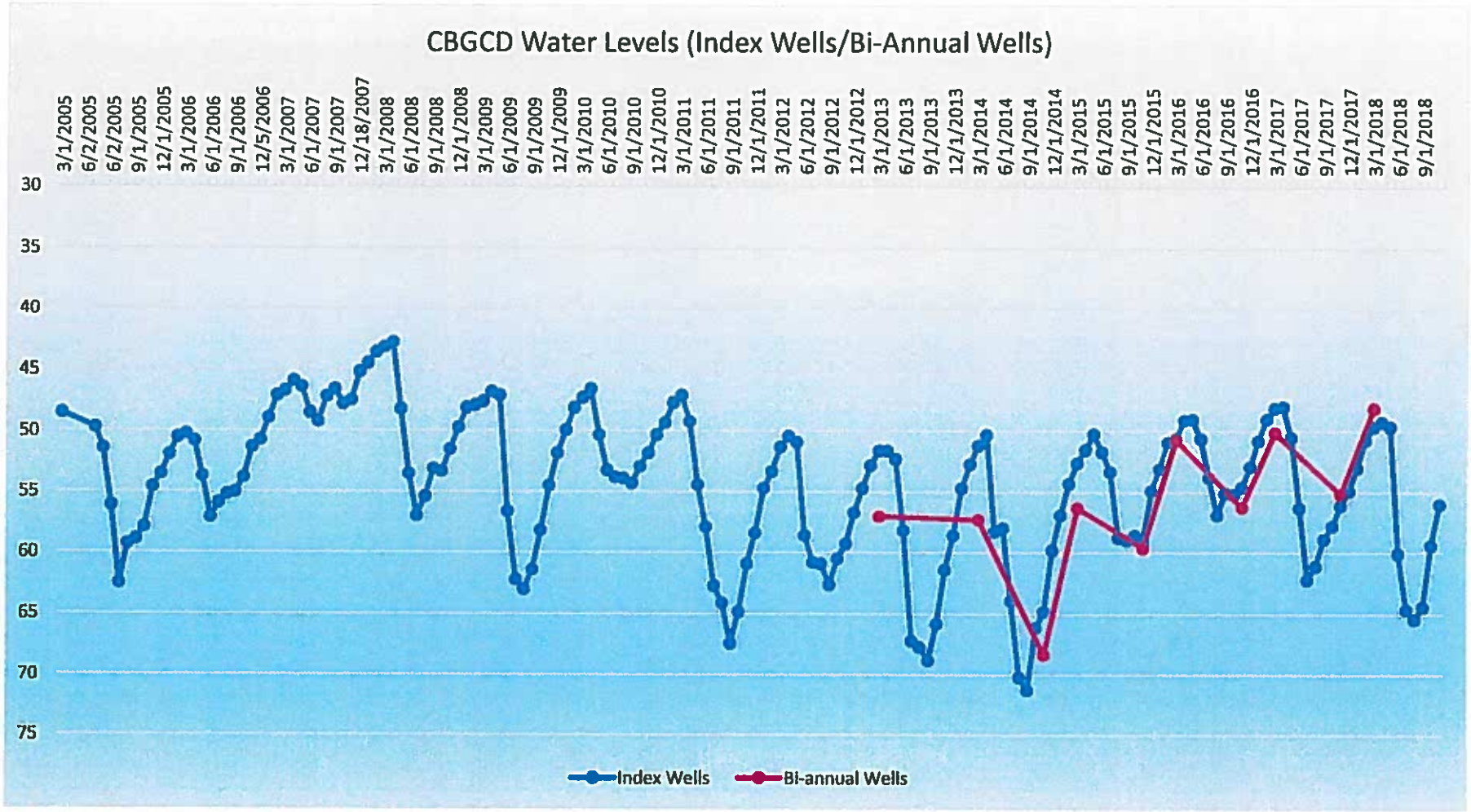
Well Grid: 66-31-107

			1-Mar	4-Apr-05	5/2/2005	6/2/2005	7/2/2005	8/2/2005	9/1/2005	10/4/2005	11/3/2005	12/1/2005
1/5/2006	2/5/2006	3/1/2006	4/1/2006	5/1/2006	6/1/2006	7/1/2006	8/1/2006	9/1/2006	10/5/2006	11/5/2006	12/5/2006	
1/10/2007	2/5/2007	3/1/2007	4/1/2007	5/1/2007	6/1/2007	7/1/2007	8/1/2007	9/1/2007	10/5/2007	11/5/2007	12/18/2007	
1/1/2008	2/1/2008	3/1/2008	4/1/2008	5/1/2008	6/1/2008	7/1/2008	8/1/2008	9/1/2008	10/1/2008	11/1/2008	12/1/2008	
1/1/2009	2/1/2009	3/1/2009	4/1/2009	5/1/2009	6/1/2009	7/1/2009	8/1/2009	9/1/2009	10/1/2009	11/1/2009	12/1/2009	
1/1/2010	2/1/2010	3/1/2010	4/1/2010	5/1/2010	6/1/2010	7/1/2010	8/1/2010	9/1/2010	10/1/2010	11/1/2010	12/1/2010	
										40.2	37.8	
1/1/2011	2/1/2011	3/1/2011	4/1/2011	5/1/2011	6/1/2011	7/1/2011	8/1/2011	9/1/2011	10/1/2011	11/1/2011	12/1/2011	
36.9	33.2	32.8	45.8	58.7	69.6	70.2	62.1	59.5	50.7	43.2	34.5	
1/1/2012	2/1/2012	3/1/2012	4/1/2012	5/1/2012	6/1/2012	7/1/2012	8/1/2012	9/1/2012	10/1/2012	11/1/2012	12/1/2012	
25.5	23.2	30.7	30.1	36.5	96.7	70.5	64.8	60.5	47.4	40.5	30.2	
1/1/2013	2/1/2013	3/1/2013	4/1/2013	5/1/2013	6/1/2013	7/1/2013	8/1/2013	9/1/2013	10/1/2013	11/1/2013	12/1/2013	
45.1	41.6	39.2	38.9	40.6	79.5	91.8	90.1	75.1	68.5	57.5	50.3	
1/1/2014	2/1/2014	3/1/2014	4/1/2014	5/1/2014	6/1/2014	7/1/2014	8/1/2014	9/1/2014	10/1/2014	11/1/2014	12/1/2014	
45.2	42.1	39.2	37.7	49.2	60.7	77.8	93.4	76.2	72.7	70.4	60.3	
1/1/2015	2/1/2015	3/1/2015	4/1/2015	5/1/2015	6/1/2015	7/1/2015	8/1/2015	9/1/2015	10/1/2015	11/1/2015	12/1/2015	
52.5	46.4	44.1	41.2	39.1	49.1	62.9	71.4	69.4	52.1	48	46	
1/1/2016	2/1/2016	3/1/2016	4/1/2016	5/1/2016	6/1/2016	7/1/2016	8/1/2016	9/1/2016	10/1/2016	11/1/2016	12/1/2016	
45	44.3	41.1	37.7	36.8	51.7	75.1	66.2	64.7	58.5	53.7	48.8	
1/1/2017	2/1/2017	3/1/2017	4/1/2017	5/1/2017	6/1/2017	7/1/2017	8/1/2017	9/1/2017	10/1/2017	11/1/2017	12/1/2017	
44	39.5	37.2	34.4	43.1	55.9	40.1	64.3	56	54.8	50.6	46	
1/1/2018	2/1/2018	3/1/2018	4/1/2018	5/1/2018	6/1/2018	7/1/2018	8/1/2018	9/1/2018	10/1/2018	11/1/2018	12/1/2018	
40.8	36	33.7	33.4	33.4	58.5	74	74	68.2	59.2	51.1		

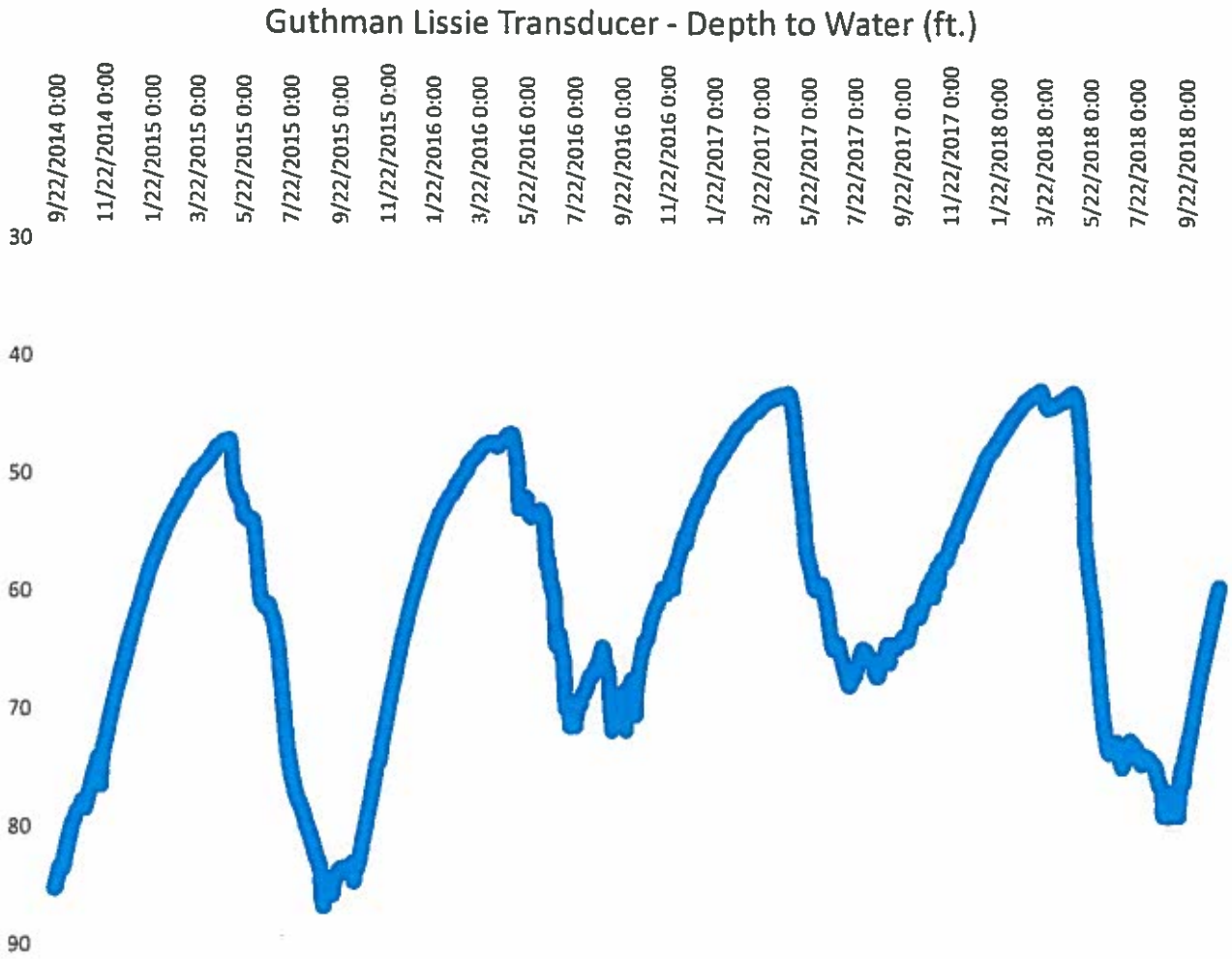
Below is a line graph showing the water level trend by taking the above highlighted 'index' wells and averaging their water levels for each month.

From 2005 through June 1, 2015, the Wintermann Jilney Well was averaged as an index well. Due to this well being brought back into production, a new well was located in the area Gertson T2 Well replaced this well as of July 1, 2015 as an index well.

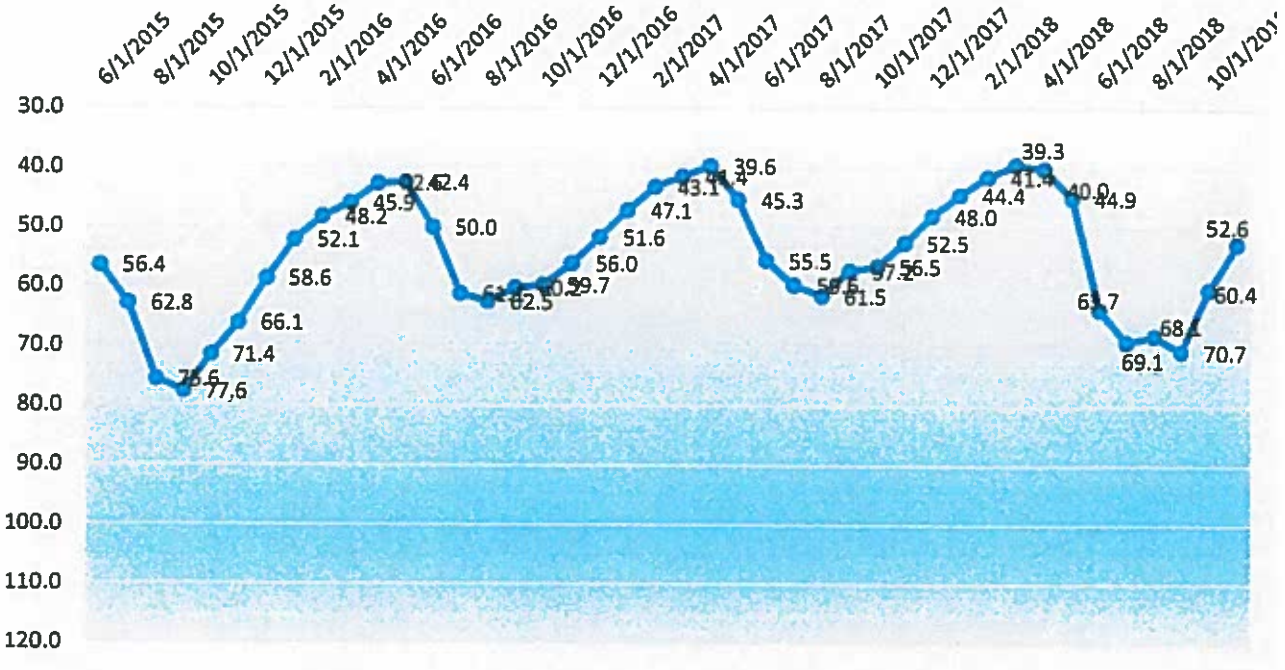




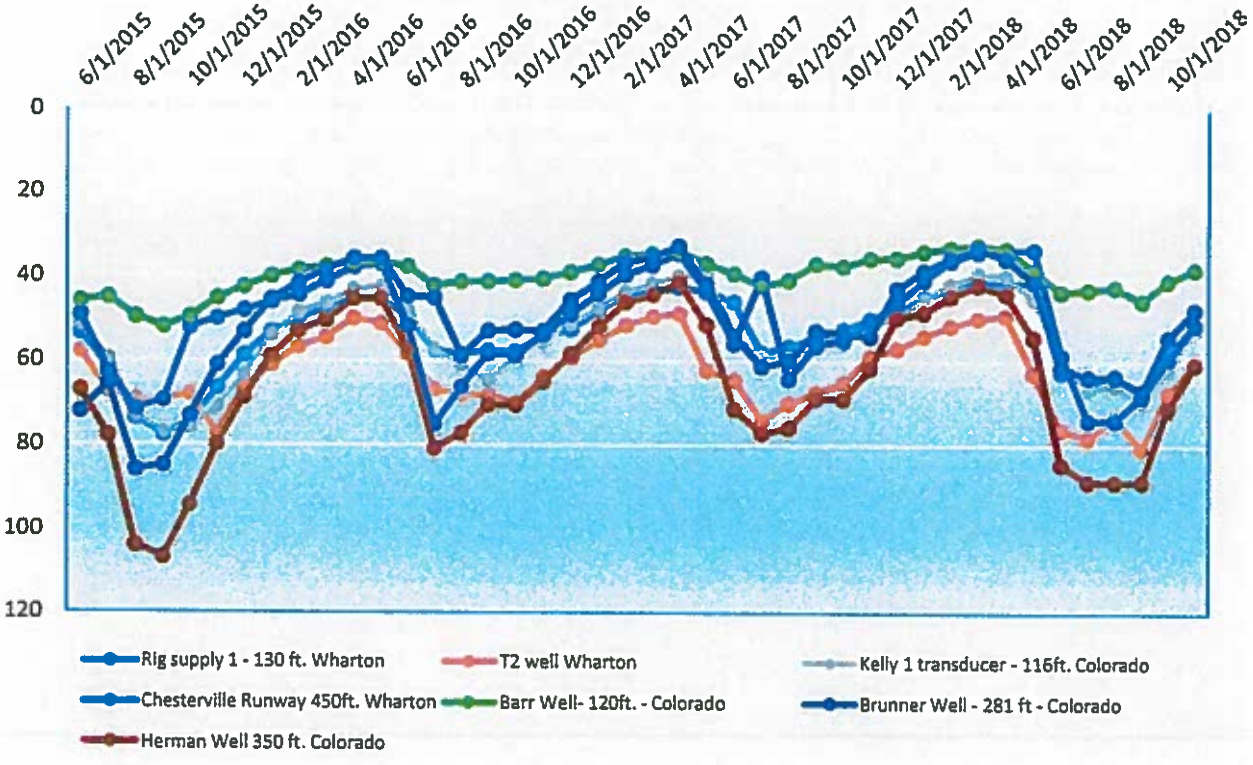
7 Index wells
18 Bi-Annual Wells


Guthman Lissie Transducer - Depth to Water (ft.)
9/22/2014 0:00
11/22/2014 0:00
1/22/2015 0:00
3/22/2015 0:00
5/22/2015 0:00
7/22/2015 0:00
9/22/2015 0:00
11/22/2015 0:00
1/22/2016 0:00
3/22/2016 0:00
5/22/2016 0:00
7/22/2016 0:00
9/22/2016 0:00
11/22/2016 0:00
1/22/2017 0:00
3/22/2017 0:00
5/22/2017 0:00
7/22/2017 0:00
9/22/2017 0:00
11/22/2017 0:00
1/22/2018 0:00
3/22/2018 0:00
5/22/2018 0:00
7/22/2018 0:00
9/22/2018 0:00
30
40
50
60
70
80
90

Critical Depletion Study Area Monitor Well Index



Individual Monitor Wells Within Critical Depletion Study Area



BatchNo: 75358

SAMPLE REPORT

T104704328-18-15

Business

Coastal Bend GCD
109 E Milam
Wharton TX 77488
Att: Neil Hudgin

Laboratory

B Environmental, LLC.
1606 E Brazos, Suite D
Victoria TX 77901
ph. 361-572-8224

Reference Information

Project: Coastal Bend GCD

Printed: Wednesday, October 17, 2018

Re: Coastal Bend GCD

Dear: Neil Hudgin

Attached are the results for sample(s) received on 9/24/2018

The analytical results relate only to the samples tested.
All supporting quality data meets the requirements of NELAC unless noted in the case narrative section of the report.

This report contains 25 pages (including the cover page)

If you have any questions concerning this report, please do not hesitate to call (361) 572-8224 or Fax us at (361) 572-4115

Respectfully Submitted,

Kevin Baros

Laboratory Director

B Environmental, LLC.
1606 E Brazos, Suite D
Victoria TX 77901

BatchNo: 75358

Batch No: 75358

Sample Receipt Checklist

Date Received: 9/24/2018

Project: Coastal Bend GCD

Received By: Hull

Login completed by: Hull (Signature) 9/24/2018 (LoginDate:)

Carrier Name: Walk In

Shipping container/cooler in good condition?	☑ YES	☐ NO	☐ Not Present	
Custody seals intact on shipping container/cooler?	☐ YES	☐ NO	☑ Not Present	
Custody seals intact on sample bottles?	☐ YES	☐ NO	☑ Not Present	
Chain of Custody present?	☑ YES	☐ NO		
Chain of Custody signed when relinquished and received	☑ YES	☐ NO		
Chain of Custody agrees with sample labels?	☑ YES	☐ NO		
Samples in proper container/bottles?	☑ YES	☐ NO		
Sample containers intact?	☑ YES	☐ NO		
Sufficient sample volume for indicated tests?	☑ YES	☐ NO		
All samples received within holding times?	☑ YES	☐ NO		
Container/Temp Blank - temperature in compliance?	☑ YES	☐ NO	>0 <6 °C On Ice	
Water - VOA vials have zero headspace? Bubble < 6mm?	☐ YES	☐ NO	☑ No VOA Vials submitted	
Water - pH acceptable upon receipt?	☑ YES	☐ NO	☐ Not Applicable	

*TEMP 4.4/4.4 | pH Adjusted? No | Checked By L. Vahrenkamp

Any No and/or N/A (not applicable) response must be detailed in the comments section below.

Client contacted: | PersonContacted:

Contacted by: | Date Contacted:

Regarding:

Comments:

Therm #4. HNO3 Lot #2-54-3. pH Paper Lot # 2-25-6.

Corrective Action:

B Environmental, LLC.
1606 E Brazos, Suite D
Victoria TX 77901

BatchNo: 75358

Sample Report Information

Sample ID:	S182671511	Client ID:	Carl Reynolds	Sampler:	Client

Client: Coastal Bend GCD
Study: Water
Project: Coastal Bend GCD
Location: Farm & Ranch Scan
Notes:

Batch No: 75358
Sampled: 9/24/2018 11:00 AM
Type: Grab
Matrix: Water

Farm & Ranch Scan (Non-Regulatory). Samples were analyzed as received; this data is not intended for regulatory requirements.

Case Narrative:

The sample exhibited no detections above the National Primary or Secondary Drinking Water Regulations list of Maximum Concentration Limits.

Analyte	Result	Units	Method	Analyst	Date/Time Analyzed	LOQ	MDL	DF	Qual	S/Out	Laboratory
.- Chloride, IC	42	mg/L	EPA 300	K Baros	9/26/2018 9:32	1	1			☐	B- E Cert. # T104704328-18-15
.- Trace Metals, ICP-SW	C	mg/L	SW-6010B	K Baros	10/2/2018 15:18					☐	B Environmental-NON NELAC
.-Arsenic	< 0.01	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Barium	0.36	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Cadmium	< 0.005	mg/L		K Baros	10/2/2018 15:18	0.005	0.005			☐	B Environmental-NON NELAC
.-Calcium	108	mg/L		K Baros	10/2/2018 15:18	0.05	0.05			☐	B Environmental-NON NELAC
.-Chromium	< 0.005	mg/L		K Baros	10/2/2018 15:18	0.005	0.005			☐	B Environmental-NON NELAC
.-Copper	< 0.01	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Iron	< 0.01	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Lead	< 0.01	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Magnesium	20.5	mg/L		K Baros	10/2/2018 15:18	0.05	0.05			☐	B Environmental-NON NELAC
.-Selenium	< 0.02	mg/L		K Baros	10/2/2018 15:18	0.02	0.02			☐	B Environmental-NON NELAC
.-Silver	< 0.01	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Sodium	24.4	mg/L		K Baros	10/2/2018 15:18	0.05	0.05			☐	B Environmental-NON NELAC
Conductivity	712	µmhos/c	SM 2510 B	T Anderson	9/24/2018 15:55	1	1			☐	B- E Cert. # T104704328-18-15
Fluoride, IC	< 0.25	mg/L	EPA 300	K Baros	9/26/2018 9:32	0.25	0.25			☐	B- E Cert. # T104704328-18-15
Hardness, Calculated	354	mg/L	SM 2340 C	K Baros	10/2/2018 15:18					☐	B Environmental-NON NELAC
Mercury CVAA - SW	< 0.002	mg/L	SW 7470		10/11/2018 8:29	0.002	0.002			☑	PCS Cert No. T104704361-18-1

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Victoria TX 77901

BatchNo: 75358

Analyte	Result	Units	Method	Analyst	Date/Time Analyzed	LOQ	MDL	DF	Qual	S/Out	Laboratory
Nitrate-N, IC	0.12	mg/L	EPA 300	K Baros	9/26/2018 9:32	0.06	0.06			☐	B- E Cert. # T104704328-18-15
pH (Standard Units)	7.56	SU	SM 4500-H+B	T Anderson	9/24/2018 15:55					☐	B- E Cert. # T104704328-18-15
Phosphate-P, IC	< 0.33	mg/L	EPA 300	K Baros	9/26/2018 9:32	0.33	0.33			☐	B- E Cert. # T104704328-18-15
Solids, Total Dissolved (	353	mg/L	Meter	T Anderson	9/24/2018 15:55	10	10			☐	B- E Cert. # T104704328-18-15
Sulfate, IC	19.5	mg/L	EPA 300	K Baros	9/26/2018 9:32	1	1			☐	B- E Cert. # T104704328-18-15

B Environmental, LLC.
1606 E Brazos, Suite D
Victoria TX 77901

BatchNo: 75358

Sample Report Information

Sample ID:	S182671512	Client ID:	Ross Kutach	Sampler:	Client

Client: Coastal Bend GCD
Study: Water
Project: Coastal Bend GCD
Location: Farm & Ranch Scan
Notes:

Batch No: 75358
Sampled: 9/24/2018 11:30 AM
Type: Grab
Matrix: Water

Farm & Ranch Scan (Non-Regulatory). Samples were analyzed as received; this data is not intended for regulatory requirements.

Case Narrative:

The sample exhibited no detections above the National Primary or Secondary Drinking Water Regulations list of Maximum Concentration Limits.

Analyte	Result	Units	Method	Analyst	Date/Time Analyzed		LOQ	MDL	DF	Qual	S/Out	Laboratory
.- Chloride, IC	22.7	mg/L	EPA 300	K Baros	9/26/2018	10:10	1	1			☐	B- E Cert. # T104704328-18-15
.- Trace Metals, ICP-SW	C	mg/L	SW-6010B	K Baros	10/2/2018	15:18					☐	B Environmental-NON NELAC
.-Arsenic	< 0.01	mg/L		K Baros	10/2/2018	15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Barium	0.31	mg/L		K Baros	10/2/2018	15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Cadmium	< 0.005	mg/L		K Baros	10/2/2018	15:18	0.005	0.005			☐	B Environmental-NON NELAC
.-Calcium	52.1	mg/L		K Baros	10/2/2018	15:18	0.05	0.05			☐	B Environmental-NON NELAC
.-Chromium	< 0.005	mg/L		K Baros	10/2/2018	15:18	0.005	0.005			☐	B Environmental-NON NELAC
.-Copper	< 0.01	mg/L		K Baros	10/2/2018	15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Iron	0.014	mg/L		K Baros	10/2/2018	15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Lead	< 0.01	mg/L		K Baros	10/2/2018	15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Magnesium	4.3	mg/L		K Baros	10/2/2018	15:18	0.05	0.05			☐	B Environmental-NON NELAC
.-Selenium	< 0.02	mg/L		K Baros	10/2/2018	15:18	0.02	0.02			☐	B Environmental-NON NELAC
.-Silver	< 0.01	mg/L		K Baros	10/2/2018	15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Sodium	13.9	mg/L		K Baros	10/2/2018	15:18	0.05	0.05			☐	B Environmental-NON NELAC
Conductivity	363	µmhos/c	SM 2510 B	T Anderson	9/24/2018	15:55	1	1			☐	B- E Cert. # T104704328-18-15
Fluoride, IC	< 0.25	mg/L	EPA 300	K Baros	9/26/2018	10:10	0.25	0.25			☐	B- E Cert. # T104704328-18-15
Hardness, Calculated	148	mg/L	SM 2340 C	K Baros	10/2/2018	15:18					☐	B Environmental-NON NELAC
Mercury CVAA - SW	< 0.002	mg/L	SW 7470		10/11/2018	8:29	0.002	0.002			☑	PCS Cert No. T104704361-18-1
Nitrate-N, IC	0.27	mg/L	EPA 300	K Baros	9/26/2018	10:10	0.06	0.06			☐	B- E Cert. # T104704328-18-15

B Environmental, LLC.
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Victoria TX 77901

BatchNo: 75358

Analyte	Result	Units	Method	Analyst	Date/Time Analyzed	LOQ	MDL	DF	Qual	S/Out	Laboratory
pH (Standard Units)	7.77	SU	SM 4500-H+B	T Anderson	9/24/2018 15:55					☐	B- E Cert. # T104704328-18-15
Phosphate-P, IC	< 0.33	mg/L	EPA 300	K Baros	9/26/2018 10:10	0.33	0.33			☐	B- E Cert. # T104704328-18-15
Solids, Total Dissolved (	175	mg/L	Meter	T Anderson	9/24/2018 15:55	10	10			☐	B- E Cert. # T104704328-18-15
Sulfate, IC	4.87	mg/L	EPA 300	K Baros	9/26/2018 10:10	1	1			☐	B- E Cert. # T104704328-18-15

B Environmental, LLC.
1606 E Brazos, Suite D
Victoria TX 77901

BatchNo: 75358

Sample Report Information

Sample ID:	S182671513	Client ID:	Hudgins Ranch	Sampler:	Client

Client: Coastal Bend GCD
Study: Water
Project: Coastal Bend GCD
Location: Farm & Ranch Scan
Notes:

Batch No: 75358
Sampled: 9/24/2018 12:00 PM
Type: Grab
Matrix: Water

Farm & Ranch Scan (Non-Regulatory). Samples were analyzed as received; this data is not intended for regulatory requirements.

Case Narrative:

The sample exhibited no detections above the National Primary or Secondary Drinking Water Regulations list of Maximum Concentration Limits.

Analyte	Result	Units	Method	Analyst	Date/Time Analyzed	LOQ	MDL	DF	Qual	S/Out	Laboratory
.- Chloride, IC	82.9	mg/L	EPA 300	K Baros	9/26/2018 10:48	1	1			☐	B- E Cert. # T104704328-18-15
.- Trace Metals, ICP-SW	C	mg/L	SW-6010B	K Baros	10/2/2018 15:18					☐	B Environmental-NON NELAC
.-Arsenic	< 0.01	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Barium	0.19	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Cadmium	< 0.005	mg/L		K Baros	10/2/2018 15:18	0.005	0.005			☐	B Environmental-NON NELAC
.-Calcium	76	mg/L		K Baros	10/2/2018 15:18	0.05	0.05			☐	B Environmental-NON NELAC
.-Chromium	< 0.005	mg/L		K Baros	10/2/2018 15:18	0.005	0.005			☐	B Environmental-NON NELAC
.-Copper	< 0.01	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Iron	0.039	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Lead	< 0.01	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Magnesium	15.6	mg/L		K Baros	10/2/2018 15:18	0.05	0.05			☐	B Environmental-NON NELAC
.-Selenium	< 0.02	mg/L		K Baros	10/2/2018 15:18	0.02	0.02			☐	B Environmental-NON NELAC
.-Silver	< 0.01	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Sodium	29.6	mg/L		K Baros	10/2/2018 15:18	0.05	0.05			☐	B Environmental-NON NELAC
Conductivity	658	µmhos/c	SM 2510 B	T Anderson	9/24/2018 15:55	1	1			☐	B- E Cert. # T104704328-18-15
Fluoride, IC	0.3	mg/L	EPA 300	K Baros	9/26/2018 10:48	0.25	0.25			☐	B- E Cert. # T104704328-18-15
Hardness, Calculated	254	mg/L	SM 2340 C	K Baros	10/2/2018 15:18					☐	B Environmental-NON NELAC
Mercury CVAA - SW	< 0.002	mg/L	SW 7470		10/11/2018 8:29	0.002	0.002			☑	PCS Cert No. T104704361-18-1
Nitrate-N, IC	0.06	mg/L	EPA 300	K Baros	9/26/2018 10:48	0.06	0.06			☐	B- E Cert. # T104704328-18-15

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BatchNo: 75358

Analyte	Result	Units	Method	Analyst	Date/Time Analyzed	LOQ	MDL	DF	Qual	S/Out	Laboratory
pH (Standard Units)	7.65	SU	SM 4500-H+B	T Anderson	9/24/2018 15:55					☐	B- E Cert. # T104704328-18-15
Phosphate-P, IC	< 0.33	mg/L	EPA 300	K Baros	9/26/2018 10:48	0.33	0.33			☐	B- E Cert. # T104704328-18-15
Solids, Total Dissolved (	322	mg/L	Meter	T Anderson	9/24/2018 15:55	10	10			☐	B- E Cert. # T104704328-18-15
Sulfate, IC	13.7	mg/L	EPA 300	K Baros	9/26/2018 10:48	1	1			☐	B- E Cert. # T104704328-18-15

B Environmental, LLC.
1606 E Brazos, Suite D
Victoria TX 77901

BatchNo: 75358

Sample Report Information

Sample ID:	S182671514	Client ID:	WITTIG	Sampler:	Client

Client: Coastal Bend GCD
Study: Water
Project: Coastal Bend GCD
Location: Farm & Ranch Scan
Notes:

Batch No: 75358
Sampled: 9/24/2018 12:30 PM
Type: Grab
Matrix: Water

Farm & Ranch Scan (Non-Regulatory). Samples were analyzed as received; this data is not intended for regulatory requirements.

Case Narrative:

The sample exhibited no detections above the National Primary or Secondary Drinking Water Regulations list of Maximum Concentration Limits.

Analyte	Result	Units	Method	Analyst	Date/Time Analyzed	LOQ	MDL	DF	Qual	S/Out	Laboratory
- Chloride, IC	68.9	mg/L	EPA 300		9/26/2018 11:26	1	1			☐	
- Trace Metals, ICP-SW	C	mg/L	SW-6010B	K Baros	10/2/2018 15:18					☐	B Environmental-NON NELAC
-Arsenic	< 0.01	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
-Barium	0.2	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
-Cadmium	< 0.005	mg/L		K Baros	10/2/2018 15:18	0.005	0.005			☐	B Environmental-NON NELAC
-Calcium	69.4	mg/L		K Baros	10/2/2018 15:18	0.05	0.05			☐	B Environmental-NON NELAC
-Chromium	< 0.005	mg/L		K Baros	10/2/2018 15:18	0.005	0.005			☐	B Environmental-NON NELAC
-Copper	< 0.01	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
-Iron	0.21	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
-Lead	< 0.01	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
-Magnesium	19.5	mg/L		K Baros	10/2/2018 15:18	0.05	0.05			☐	B Environmental-NON NELAC
-Selenium	< 0.02	mg/L		K Baros	10/2/2018 15:18	0.02	0.02			☐	B Environmental-NON NELAC
-Silver	< 0.01	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
-Sodium	37.8	mg/L		K Baros	10/2/2018 15:18	0.05	0.05			☐	B Environmental-NON NELAC
Conductivity	649	µmhos/c	SM 2510 B	T Anderson	9/24/2018 15:55	1	1			☐	B- E Cert. # T104704328-18-15
Fluoride, IC	0.26	mg/L	EPA 300		9/26/2018 11:26	0.25	0.25			☐	
Hardness, Calculated	253	mg/L	SM 2340 C	K Baros	10/2/2018 15:18					☐	B Environmental-NON NELAC
Mercury CVAA - SW	< 0.002	mg/L	SW 7470		10/11/2018 8:29	0.002	0.002			☑	PCS Cert No T104704361-18-1
Nitrate-N, IC	< 0.06	mg/L	EPA 300		9/26/2018 11:26	0.06	0.06			☐	

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Victoria TX 77901

BatchNo: 75358

Analyte	Result	Units	Method	Analyst	Date/Time Analyzed	LOQ	MDL	DF	Qual	S/Out	Laboratory
pH (Standard Units)	7.81	SU	SM 4500-H+B	T Anderson	9/24/2018 15:55					☐	B- E Cert. # T104704328-18-15
Phosphate-P, IC	< 0.33	mg/L	EPA 300		9/26/2018 11:26	0.33	0.33			☐	
Solids, Total Dissolved (	318	mg/L	Meter	T Anderson	9/24/2018 15:55	10	10			☐	B- E Cert. # T104704328-18-15
Sulfate, IC	15.8	mg/L	EPA 300		9/26/2018 11:26	1	1			☐	

B Environmental, LLC.
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Victoria TX 77901

BatchNo: 75358

Sample Report Information

Sample ID:	S182671515	Client ID:	Catherine Williams	Sampler:	Client

Client: Coastal Bend GCD
Study: Water
Project: Coastal Bend GCD
Location: Farm & Ranch Scan
Notes:

Batch No: 75358
Sampled: 9/24/2018 12:40 PM
Type: Grab
Matrix: Water

Farm & Ranch Scan (Non-Regulatory). Samples were analyzed as received; this data is not intended for regulatory requirements.

Case Narrative:

The sample exhibited no detections above the National Primary or Secondary Drinking Water Regulations list of Maximum Concentration Limits.

Analyte	Result	Units	Method	Analyst	Date/Time Analyzed	LOQ	MDL	DF	Qual	S/Out	Laboratory
.- Chloride, IC	56.3	mg/L	EPA 300		9/26/2018 12:04	1	1			☐	
.- Trace Metals, ICP-SW	C	mg/L	SW-6010B	K Baros	10/2/2018 15:18					☐	B Environmental-NON NELAC
.-Arsenic	< 0.01	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Barium	0.13	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Cadmium	< 0.005	mg/L		K Baros	10/2/2018 15:18	0.005	0.005			☐	B Environmental-NON NELAC
.-Calcium	63	mg/L		K Baros	10/2/2018 15:18	0.05	0.05			☐	B Environmental-NON NELAC
.-Chromium	< 0.005	mg/L		K Baros	10/2/2018 15:18	0.005	0.005			☐	B Environmental-NON NELAC
.-Copper	< 0.01	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Iron	0.067	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Lead	< 0.01	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Magnesium	17.2	mg/L		K Baros	10/2/2018 15:18	0.05	0.05			☐	B Environmental-NON NELAC
.-Selenium	< 0.02	mg/L		K Baros	10/2/2018 15:18	0.02	0.02			☐	B Environmental-NON NELAC
.-Silver	< 0.01	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Sodium	36.7	mg/L		K Baros	10/2/2018 15:18	0.05	0.05			☐	B Environmental-NON NELAC
Conductivity	627	µmhos/c	SM 2510 B	T Anderson	9/24/2018 15:55	1	1			☐	B- E Cert. # T104704328-18-15
Fluoride, IC	0.28	mg/L	EPA 300		9/26/2018 12:04	0.25	0.25			☐	
Hardness, Calculated	228	mg/L	SM 2340 C	K Baros	10/2/2018 15:18					☐	B Environmental-NON NELAC
Mercury CVAA - SW	< 0.002	mg/L	SW 7470		10/11/2018 8:29	0.002	0.002			☑	PCS Cert No. T104704361-18-1
Nitrate-N, IC	< 0.06	mg/L	EPA 300		9/26/2018 12:04	0.06	0.06			☐	

B Environmental, LLC.
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Victoria TX 77901

BatchNo: 75358

Analyte	Result	Units	Method	Analyst	Date/Time Analyzed	LOQ	MDL	DF	Qual	S/Out	Laboratory
pH (Standard Units)	7.84	SU	SM 4500-H+B	T Anderson	9/24/2018 15:55					☐	B- E Cert. # T104704328-18-15
Phosphate-P, IC	< 0.33	mg/L	EPA 300		9/26/2018 12:04	0.33	0.33			☐	
Solids, Total Dissolved (	307	mg/L	Meter	T Anderson	9/24/2018 15:55	10	10			☐	B- E Cert. # T104704328-18-15
Sulfate, IC	16.6	mg/L	EPA 300		9/26/2018 12:04	1	1			☐	

B Environmental, LLC.
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Victoria TX 77901

BatchNo: 75358

Sample Report Information

Sample ID:	S182671516	Client ID:	Larry Cerny	Sampler:	Client

Client: Coastal Bend GCD
Study: Water
Project: Coastal Bend GCD
Location: Farm & Ranch Scan
Notes:

Batch No: 75358
Sampled: 9/24/2018 1:30 PM
Type: Grab
Matrix: Water

Farm & Ranch Scan (Non-Regulatory). Samples were analyzed as received; this data is not intended for regulatory requirements.

Case Narrative:

The sample exhibited no detections above the National Primary or Secondary Drinking Water Regulations list of Maximum Concentration Limits.

Analyte	Result	Units	Method	Analyst	Date/Time Analyzed	LOQ	MDL	DF	Qual	S/Out	Laboratory
.- Chloride, IC	38.7	mg/L	EPA 300	K Baros	9/26/2018 12:42	1	1			☐	B- E Cert. # T104704328-18-15
.- Trace Metals, ICP-SW	C	mg/L	SW-6010B	K Baros	10/2/2018 15:18					☐	B Environmental-NON NELAC
.-Arsenic	< 0.01	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Barium	0.16	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Cadmium	< 0.005	mg/L		K Baros	10/2/2018 15:18	0.005	0.005			☐	B Environmental-NON NELAC
.-Calcium	71	mg/L		K Baros	10/2/2018 15:18	0.05	0.05			☐	B Environmental-NON NELAC
.-Chromium	< 0.005	mg/L		K Baros	10/2/2018 15:18	0.005	0.005			☐	B Environmental-NON NELAC
.-Copper	< 0.01	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Iron	< 0.01	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Lead	< 0.01	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Magnesium	8.4	mg/L		K Baros	10/2/2018 15:18	0.05	0.05			☐	B Environmental-NON NELAC
.-Selenium	< 0.02	mg/L		K Baros	10/2/2018 15:18	0.02	0.02			☐	B Environmental-NON NELAC
.-Silver	< 0.01	mg/L		K Baros	10/2/2018 15:18	0.01	0.01			☐	B Environmental-NON NELAC
.-Sodium	23.2	mg/L		K Baros	10/2/2018 15:18	0.05	0.05			☐	B Environmental-NON NELAC
Conductivity	521	µmhos/c	SM 2510 B	T Anderson	9/24/2018 15:55	1	1			☐	B- E Cert. # T104704328-18-15
Fluoride, IC	< 0.25	mg/L	EPA 300	K Baros	9/26/2018 12:42	0.25	0.25			☐	B- E Cert. # T104704328-18-15
Hardness, Calculated	212	mg/L	SM 2340 C	K Baros	10/2/2018 15:18					☐	B Environmental-NON NELAC
Mercury CVAA - SW	< 0.002	mg/L	SW 7470		10/11/2018 8:29	0.002	0.002			☑	PCS Cert No. T104704361-18-1
Nitrate-N, IC	0.49	mg/L	EPA 300	K Baros	9/26/2018 12:42	0.06	0.06			☐	B- E Cert. # T104704328-18-15

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Victoria TX 77901

BatchNo: 75358

QA Summary Report

Parameter	ID	Result	Ref Value	Amt Added	LOQ	Qualifer	Control	Flag	Comments
Method Blank									
.- Chloride, IC 9/26/2018 5:43	Q182711040	<1mg/L	0		1		1		Blank Acceptable.
.-Arsenic 10/2/2018 14:02	Q182891845	<0.01mg/L	0		0.01		0.01		Blank Acceptable.
.-Barium 10/2/2018 14:02	Q182891845	<0.01mg/L	0		0.01		0.01		Blank Acceptable.
.-Cadmium 10/2/2018 14:02	Q182891845	<0.005mg/L	0		0.005		0.005		Blank Acceptable.
.-Calcium 10/2/2018 14:02	Q182891845	<0.5mg/L	0		0.5		0.5		Blank Acceptable.
.-Chromium 10/2/2018 14:02	Q182891845	<0.005mg/L	0		0.005		0.005		Blank Acceptable.
.-Copper 10/2/2018 14:02	Q182891845	<0.01mg/L	0		0.01		0.01		Blank Acceptable.
.-Iron 10/2/2018 14:02	Q182891845	<0.01mg/L	0		0.01		0.01		Blank Acceptable.
.-Lead 10/2/2018 14:02	Q182891845	<0.01mg/L	0		0.01		0.01		Blank Acceptable.
.-Magnesium 10/2/2018 14:02	Q182891845	<0.05mg/L	0		0.05		0.05		Blank Acceptable.
.-Selenium 10/2/2018 14:02	Q182891845	<0.02mg/L	0		0.02		0.02		Blank Acceptable.
.-Silver 10/2/2018 14:02	Q182891845	<0.01mg/L	0		0.01		0.01		Blank Acceptable.
.-Sodium 10/2/2018 14:02	Q182891845	<0.5mg/L	0		0.5		0.5		Blank Acceptable.
Fluoride, IC 9/26/2018 5:43	Q182711040	<0.25mg/L	0		0.25		0.25		Blank Acceptable.
Nitrate-N, IC 9/26/2018 5:43	Q182711040	<0.06mg/L	0		0.06		0.06		Blank Acceptable.
Nitrite-N, IC 9/26/2018 5:43	Q182711040	<0.01mg/L	0		0.01		0.01		Blank Acceptable.
Phosphate-P, IC 9/26/2018 5:43	Q182711040	<0.33mg/L	0		0.33		0.33		Blank Acceptable.
Sulfate, IC 9/26/2018 5:43	Q182711040	<1mg/L	0		1		1		Blank Acceptable.

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Victoria TX 77901

BatchNo: 75358

Parameter	ID	Result	Ref Value	Amt Added	LOQ	Qualifer	Control	Flag	Comments
Duplicate									
.- Chloride, IC 9/26/2018 8:15	Q18271104C	563mg/L	561		1	0.4%	20		Duplicate RPD Acceptable.
Fluoride, IC 9/26/2018 8:15	Q18271104C	9.85mg/L	9.84		0.25	0.1%	20		Duplicate RPD Acceptable.
Nitrate-N, IC 9/26/2018 8:15	Q18271104C	8.28mg/L	8.27		0.06	0.1%	20		Duplicate RPD Acceptable.
Nitrite-N, IC 9/26/2018 8:15	Q18271104C	3.01mg/L	3.03		0.01	0.7%	20		Duplicate RPD Acceptable.
Phosphate-P, IC 9/26/2018 8:15	Q18271104C	17mg/L	17		0.33	0.0%	20		Duplicate RPD Acceptable.
Sulfate, IC 9/26/2018 8:15	Q18271104C	212mg/L	211		1	0.5%	20		Duplicate RPD Acceptable.

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BatchNo: 75358

Parameter	ID	Result	Ref Value	Amt Added	LOQ	Qualifer	Control	Flag	Comments
Laboratory Control Standard									
.- Chloride, IC	Q182711042	24.4mg/L	25		1	97.6%	80 - 120		Standard Recovery Acceptable.
9/26/2018 6:21						2.4%	20		Standard RPD Acceptable.
.-Arsenic	Q182891850	0.53mg/L	0.5		0.01	106.0%	80 - 120		Standard Recovery Acceptable.
10/2/2018 14:06						5.8%	20		Standard RPD Acceptable.
.-Barium	Q182891850	0.53mg/L	0.5		0.01	106.0%	80 - 120		Standard Recovery Acceptable.
10/2/2018 14:06						5.8%	20		Standard RPD Acceptable.
.-Cadmium	Q182891850	0.52mg/L	0.5		0.005	104.0%	80 - 120		Standard Recovery Acceptable.
10/2/2018 14:06						3.9%	20		Standard RPD Acceptable.
.-Calcium	Q182891850	5.26mg/L	5		0.5	105.2%	80 - 120		Standard Recovery Acceptable.
10/2/2018 14:06						5.1%	20		Standard RPD Acceptable.
.-Chromium	Q182891850	0.51mg/L	0.5		0.005	102.0%	80 - 120		Standard Recovery Acceptable.
10/2/2018 14:06						2.0%	20		Standard RPD Acceptable.
.-Copper	Q182891850	0.49mg/L	0.5		0.01	98.0%	80 - 120		Standard Recovery Acceptable.
10/2/2018 14:06						2.0%	20		Standard RPD Acceptable.
.-Iron	Q182891850	0.52mg/L	0.5		0.01	104.0%	80 - 120		Standard Recovery Acceptable.
10/2/2018 14:06						3.9%	20		Standard RPD Acceptable.
.-Lead	Q182891850	0.51mg/L	0.5		0.01	102.0%	80 - 120		Standard Recovery Acceptable.
10/2/2018 14:06						2.0%	20		Standard RPD Acceptable.
.-Magnesium	Q182891850	5.29mg/L	5		0.05	105.8%	80 - 120		Standard Recovery Acceptable.
10/2/2018 14:06						5.6%	20		Standard RPD Acceptable.
.-Selenium	Q182891850	0.51mg/L	0.5		0.02	102.0%	80 - 120		Standard Recovery Acceptable.
10/2/2018 14:06						2.0%	20		Standard RPD Acceptable.
.-Silver	Q182891850	0.102mg/L	0.1		0.01	102.0%	80 - 120		Standard Recovery Acceptable.
10/2/2018 14:06						2.0%	20		Standard RPD Acceptable.
.-Sodium	Q182891850	4.75mg/L	5		0.5	95.0%	80 - 120		Standard Recovery Acceptable.
10/2/2018 14:06						5.1%	20		Standard RPD Acceptable.
Fluoride, IC	Q182711042	1.97mg/L	2		0.25	98.5%	80 - 120		Standard Recovery Acceptable.
9/26/2018 6:21						1.5%	20		Standard RPD Acceptable.
Nitrate-N, IC	Q182711042	0.43mg/L	0.45		0.06	95.6%	80 - 120		Standard Recovery Acceptable.
9/26/2018 6:21						4.5%	25		Standard RPD Acceptable.
Nitrite-N, IC	Q182711042	0.59mg/L	0.61		0.01	96.7%	80 - 120		Standard Recovery Acceptable.
9/26/2018 6:21						3.3%	25		Standard RPD Acceptable.
Phosphate-P, IC	Q182711042	3.02mg/L	3.26		0.33	92.6%	80 - 120		Standard Recovery Acceptable.
9/26/2018 6:21						7.6%	20		Standard RPD Acceptable.
Sulfate, IC	Q182711042	24.9mg/L	25		1	99.6%	80 - 120		Standard Recovery Acceptable.
9/26/2018 6:21						0.4%	20		Standard RPD Acceptable.

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Victoria TX 77901

BatchNo: 75358

Parameter	ID	Result	Ref Value	Amt Added	LOQ	Qualifer	Control	Flag	Comments
Matrix Spike									
.- Chloride, IC	Q18271104A	563mg/L	561	125	1	101.6%	80 - 120		Spike Recovery Acceptable.
9/26/2018 8:15						0.4%	20		Spike RPD Acceptable.
Fluoride, IC	Q18271104A	9.85mg/L	10.6	10	0.25	92.5%	80 - 120		Spike Recovery Acceptable.
9/26/2018 8:15						7.3%	20		Spike RPD Acceptable.
Nitrate-N, IC	Q18271104A	8.28mg/L	8.23	2.25	0.06	102.2%	80 - 120		Spike Recovery Acceptable.
9/26/2018 8:15						0.6%	20		Spike RPD Acceptable.
Nitrite-N, IC	Q18271104A	3.01mg/L	3.05	3.05	0.01	98.7%	80 - 120		Spike Recovery Acceptable.
9/26/2018 8:15						1.3%	20		Spike RPD Acceptable.
Phosphate-P, IC	Q18271104A	17mg/L	18.4	16.3	0.33	91.4%	80 - 120		Spike Recovery Acceptable.
9/26/2018 8:15						7.9%	20		Spike RPD Acceptable.
Sulfate, IC	Q18271104A	212mg/L	213	125	1	99.2%	70 - 130		Spike Recovery Acceptable.
9/26/2018 8:15						0.5%	20		Spike RPD Acceptable.
Matrix Spike Dup									
.- Chloride, IC	Q18271104B	561mg/L	561	125	1	100.0%	80 - 120		Spike Recovery Acceptable.
9/26/2018 8:53						0.0%	20		Spike RPD Acceptable.
Fluoride, IC	Q18271104B	9.85mg/L	10.6	10	0.25	92.5%	80 - 120		Spike Recovery Acceptable.
9/26/2018 8:53						7.3%	20		Spike RPD Acceptable.
Nitrate-N, IC	Q18271104B	8.28mg/L	8.23	2.25	0.06	102.2%	80 - 120		Spike Recovery Acceptable.
9/26/2018 8:53						0.6%	20		Spike RPD Acceptable.
Nitrite-N, IC	Q18271104B	3.01mg/L	3.05	3.05	0.01	98.7%	80 - 120		Spike Recovery Acceptable.
9/26/2018 8:53						1.3%	20		Spike RPD Acceptable.
Phosphate-P, IC	Q18271104B	17mg/L	18.4	16.3	0.33	91.4%	80 - 120		Spike Recovery Acceptable.
9/26/2018 8:53						7.9%	20		Spike RPD Acceptable.
Sulfate, IC	Q18271104B	212mg/L	213	125	1	99.2%	70 - 130		Spike Recovery Acceptable.
9/26/2018 8:53						0.5%	20		Spike RPD Acceptable.

Flag and Qualifier Legend

Negative - Result Detected
Caution - Problem Detected
Warning - Null Value

MDL = Method Detection Limit
LOQ = Limit of Quantitation
S = surrogate standard out of limit

DF = Dilution Factor
J = Analyte detected between MDL and LOQ
H = sample out of hold time

MS, MSD, RPD- Failure may occur due to matrix interference, data released per QA plan

Wednesday, October 17, 2018 **B Environmental - LDMS QA Report Summary**

Note: THANK YOU!

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Batch # 75358

Client Information	Sample Information	Laboratory Information
Kevin Baros B Environmental, LLC 1606 E Brazos Street, Ste D Victoria, TX 77901	Project Name: 75358 Sample ID: S182671511 Matrix: Non-Potable Water Date/Time Taken: 09/24/2018 1100	PCS Sample #: 526832 **Page 1 of 1** Date/Time Received: 09/26/2018 09:45 Report Date: 10/11/2018 Approved by: Chuck Wallgren Chuck Wallgren, President

Test Description	Result	Units	RL	Analysis Date/Time	Method	Analyst
Mercury/CVAA (Total)	<0.002	mg/L	0.002	10/11/2018 08:29	EPA 245.1	DJL

Quality Assurance Summary

Test Description	Precision	Limit	LCL	MS	MSD	UCL	LCS	LCS Limit
Mercury/CVAA (Total)	<1	20	75	85	85	125	100	85 - 115

Quality Statement: All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.

These analytical results relate only to the sample tested.
All data is reported on an "As Is" basis unless designated as "Dry Wt."
RL = Reporting Limits

QC Data Reported in %, Except BOD in mg/l.

Web Site: www.pcslab.net
e-mail: chuck@pcslab.net
Toll Free 800-880-4616
1532 Universal City Blvd, Suite 100
Universal City, TX 78148-3318
210-340-0343
FAX # 210-658-7903

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Batch # 75358

Client Information	Sample Information	Laboratory Information
Kevin Baros B Environmental, LLC 1606 E Brazos Street, Ste D Victoria, TX 77901	Project Name: 75358 Sample ID: S182671512 Matrix: Non-Potable Water Date/Time Taken: 09/24/2018 1130	PCS Sample #: 526833 Page 1 of 1 Date/Time Received: 09/26/2018 09:45 Report Date: 10/11/2018 Approved by: Chuck Wallgren, President

Test Description	Result	Units	RL	Analysis Date/Time	Method	Analyst
Mercury/CVAA (Total)	<0.002	mg/L	0.002	10/11/2018 08:29	EPA 245.1	DJL

Quality Assurance Summary

Test Description	Precision	Limit	LCL	MS	MSD	UCL	LCS	LCS Limit
Mercury/CVAA (Total)	<1	20	75	85	85	125	100	85 - 115

Quality Statement: All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.

These analytical results relate only to the sample tested.
All data is reported on an "As Is" basis unless designated as "Dry Wt."
RL = Reporting Limits
QC Data Reported in %, Except BOD in mg/L

Final Report Page 20 of 25

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FAX # 210-658-7903

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Batch # 75358

Client Information	Sample Information	Laboratory Information
Kevin Baros B Environmental, LLC 1606 E Brazos Street, Ste D Victoria, TX 77901	Project Name: 75358 Sample ID: S182671513 Matrix: Non-Potable Water Date/Time Taken: 09/24/2018 1200	PCS Sample #: 526834 Page 1 of 1 Date/Time Received: 09/26/2018 09:45 Report Date: 10/11/2018 Approved by: Chuck Wallgren Chuck Wallgren, President

Test Description	Result	Units	RL	Analysis Date/Time	Method	Analyst
Mercury/CVAA (Total)	<0.002	mg/L	0.002	10/11/2018 08:29	EPA 245.1	DJL

Quality Assurance Summary

Test Description	Precision	Limit	LCL	MS	MSD	UCL	LCS	LCS Limit
Mercury/CVAA (Total)	<1	20	75	85	85	125	100	85 - 115

Quality Statement: All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.

These analytical results relate only to the sample tested.
All data is reported on an "As Is" basis unless designated as "Dry Wt."
RL = Reporting Limits
QC Data Reported in %, Except BOD in mg/L

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POLLUTION CONTROL SERVICES

Report of Sample Analysis

Batch #75358

Client Information	Sample Information	Laboratory Information
Kevin Baros B Environmental, LLC 1606 E Brazos Street, Ste D Victoria, TX 77901	Project Name: 75358 Sample ID: S182671514 Matrix: Non-Potable Water Date/Time Taken: 09/24/2018 1230	PCS Sample #: 526835 **Page 1 of 1** Date/Time Received: 09/26/2018 09:45 Report Date: 10/11/2018 Approved by: Chuck Wallgren, President

Test Description	Result	Units	RL	Analysis Date/Time	Method	Analyst
Mercury/CVAA (Total)	<0.002	mg/L	0.002	10/11/2018 08:29	EPA 245.1	DJL

Quality Assurance Summary

Test Description	Precision	Limit	LCL	MS	MSD	UCL	LCS	LCS Limit
Mercury/CVAA (Total)	<1	20	75	85	85	125	100	85 - 115

Quality Statement: ***All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.***

These analytical results relate only to the sample tested.
All data is reported on an "As Is" basis unless designated as "Dry Wt."
RL = Reporting Limits

QC Data Reported in %, Except BOD in mg/L

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FAX # 210-658-7903

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Batch# 75358

Client Information	Sample Information	Laboratory Information
Kevin Baros B Environmental, LLC 1606 E Brazos Street, Ste D Victoria, TX 77901	Project Name: 75358 Sample ID: S182671515 Matrix: Non-Potable Water Date/Time Taken: 09/24/2018 1240	**PCS Sample #: 526836** **Page 1 of 1** Date/Time Received: 09/26/2018 09:45 Report Date: 10/11/2018 Approved by: Chuck Wallgren, President

Test Description	Result	Units	RL	Analysis Date/Time	Method	Analyst
Mercury/CVAA (Total)	<0.002	mg/L	0.002	10/11/2018 08:29	EPA 245.1	DJL

Quality Assurance Summary

Test Description	Precision	Limit	LCL	MS	MSD	UCL	LCS	LCS Limit
Mercury/CVAA (Total)	<1	20	75	85	85	125	100	85 - 115

Quality Statement: ***All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.***

These analytical results relate only to the sample tested.
All data is reported on an "As Is" basis unless designated as "Dry Wt."
RL = Reporting Limits

QC Data Reported in %, Except BOD in mg/L

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Universal City, TX 78148-3318
210-340-0343
FAX # 210-658-7903

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Batch #75358

Client Information	Sample Information	Laboratory Information
Kevin Baros B Environmental, LLC 1606 E Brazos Street, Ste D Victoria, TX 77901	Project Name: 75358 Sample ID: S182671516 Matrix: Non-Potable Water Date/Time Taken: 09/24/2018 1330	PCS Sample #: 526837 **Page 1 of 1** Date/Time Received: 09/26/2018 09:45 Report Date: 10/11/2018 Approved by: Chuck Wallgren, President

Test Description	Result	Units	RL	Analysis Date/Time	Method	Analyst
Mercury/CVAA (Total)	<0.002	mg/L	0.002	10/11/2018 08:29	EPA 245.1	DJL

Quality Assurance Summary

Test Description	Precision	Limit	LCL	MS	MSD	UCL	LCS	LCS Limit
Mercury/CVAA (Total)	<1	20	75	85	85	125	100	85 - 115

Quality Statement: ***All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.***

These analytical results relate only to the sample tested.
All data is reported on an "As Is" basis unless designated as "Dry Wt."
RL = Reporting Limits
QC Data Reported in %, Except BOD in mg/L

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Web Site: www.pcslab.net
e-mail: chuck@pcslab.net
Toll Free 800-880-4616
1532 Universal City Blvd, Suite 100
Universal City, TX 78148-3318
210-340-0343
FAX # 210-658-7903

B Environmental Laboratory, LLC
1606 E Brazos Suite D Victoria, Texas 77901 ph. (361) 572-8224

Chain Of Custody Record

Batch #75358 | TEMP UN-C: 4.4 | Page ___ of ___
THERM ID# 4 | TEMP Corr: 4.4

Customer / Report Information

Name: NEIL HUDGINS COASTAL BEND GCD
Attention:
Address:

Billing Information

☐ Check box if Billing is the same as Report Information
Address: 109 E. MILAM ST Wharton, TX 77488
Attention: PO #
Project:
Comments:

Phone: | FAX:
EMAIL:

Requested Analysis | Completed By laboratory

F&R scan

Sample Information

Collected By:

Client / Field Sample ID	Collected Date	Collected Time	Matrix (DW Drinking H20, S - Solid, WW - Waste H20, SL - Sludge, L - Liquid, w Water)	Container TYPE	Container NUMBER	Container Size	Preservative		Custody Seals Present / Intact	LAB Sample Number
CARL REYNOLDS	9/24	11am	W	P	1	gal	☐ H2SO4 ☐ H3PO4 ☒ ICE ☐ ____	☐ HNO3 ☐ NaOH ☐ HCL ☐ Na2SO3	X	S182671511
Ross Kutach		11:30 am	W	P	1	gal	☐ H2SO4 ☐ H3PO4 ☒ ICE ☐ ____	☐ HNO3 ☐ NaOH ☐ HCL ☐ Na2SO3	X	S182671512
Hudgins Ranch		12:00 pm	W	P	1	gal	☐ H2SO4 ☐ H3PO4 ☒ ICE ☐ ____	☐ HNO3 ☐ NaOH ☐ HCL ☐ Na2SO3	X	S182671513
WITTIG		12:30 pm	W	P	1	gal	☐ H2SO4 ☐ H3PO4 ☒ ICE ☐ ____	☐ HNO3 ☐ NaOH ☐ HCL ☐ Na2SO3	X	S182671514
CATHERINE WILLIAMS		12:40 pm	W	P	1	gal	☐ H2SO4 ☐ H3PO4 ☒ ICE ☐ ____	☐ HNO3 ☐ NaOH ☐ HCL ☐ Na2SO3	X	S182671515
LARRY CERNY		1:30 pm	W	P	1	gal	☐ H2SO4 ☐ H3PO4 ☒ ICE ☐ ____	☐ HNO3 ☐ NaOH ☐ HCL ☐ Na2SO3	X	S182671516
							☐ H2SO4 ☐ H3PO4 ☐ ICE ☐ ____	☐ HNO3 ☐ NaOH ☐ HCL ☐ Na2SO3		

Custody Seals Present: Yes ☐ No ☐
Intact: Yes ☐ No ☐

Required Turnaround: ☐ Routine (6-10 Business days) **Expedite / Rush:** ☐ 1 Business Day ☐ 2 Business Days ☐ 3 Business days ☐ 5 Business days ☐ Other

REMARKS:

Surcharge will apply to RUSH TAT Authorized BY: 9-24-18

Container Type: P=Plastic, G=Glass, V=Voa, O=Other Carrier ID :

Relinquished By:	Date:	9-24-18	Time:	1505	Received By: Ally Hull	Date: 9-24-18	Time: 1505
Relinquished By:	Date:		Time:		Received By:	Date:	Time:
Relinquished By	Date:		Time:		Received By:	Date:	Time:

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

2.1 Objective – Each year, the District will make an evaluation of the District Rules (Appendix B) to determine whether any amendments are recommended to decrease the amount of waste of groundwater within the District.
2.1 Performance Standard – The District will include a discussion of the annual evaluation
of the District Rules (Appendix B) and the determination of whether any amendments to the
rules are recommended to prevent the waste of groundwater in the Annual Report of the District provided to the Board of Directors.

2.2 Objective – Each year, the District will provide at least one article annually on the District's website on eliminating and reducing wasteful practices in the use of groundwater.
2.2 Performance Standard – Each year, a copy of the information provided on the District's
website regarding groundwater waste reduction will be included in the District's Annual Report to be given to the District Board of Directors.

COASTAL BEND GROUNDWATER CONSERVATION DISTRICT
BOARD OF DIRECTORS MEETING

AGENDA PREPARED AND POSTED: August 09, 2018
DATE OF MEETING: August 14, 2018
TIME OF MEETING: 8:00 A.M.

PLACE WHERE MEETING WAS HELD: Coastal Bend GCD, 109 E. Milam, WHARTON, TEXAS 77488.

I. **In Attendance:**
Ronald Gertson – President CBGCD; L.G. Raun – Vice-President; Daniel Berglund – Director CBGCD; Aland Wittig – Director CBGCD; Neil Hudgins – Manager CBGCD; Jaime Bosch – Office Manager CBGCD; Greg Ellis; and Judge Spenrath.

II. **Call to Order:**
The meeting was called to order at 8:01 A.M. by President Gertson.

III. **Public Comments:**
None

IV. **Approval of Minutes:**
Director Berglund made a motion to accept the meeting minutes, with the addition to well monitoring report (continued discussion to expand monitor well network) and the permit hearing minutes as presented for July 25, 2018. Vice-President Raun seconded. All voted for; motion carried.

V. **Manager's Report:**
Financial Report – Mr. Hudgins reported a checking account balance of $375,116.26; a money market balance of $385,328.29; and CD balance of $512,915.16. A budget vs. actual and the balance sheet for July was also presented. After discussion and review, Director Berglund made a motion to approve the financials as presented. Director Wittig seconded. All voted for; motion carried.
Well Monitoring Update – Mr. Hudgins presented the board with the monitor well levels as of August 01, 2018. The index well graph shows a 1-foot recovery from the previous month of July. The critical depletion study area monitor wells show a 2 feet recovery from July.
Upcoming Meetings – TAGD Groundwater Summit August 28-30 in San Antonio, 2 House and Natural Resource Committee Meetings

VI. **Discussion to Approve Permit Applications:** After discussion and review of the permit application for Willie Gavranovic OP-11101902, Director Berglund made a motion to approve the permit applications as presented. Director Wittig seconded. All voted for; motion carried.

VII. **Annual Evaluation of District Investment Policy:** After review of the district investment policy, Vice-President Raun made a motion to approve the policy as presented. Director Berglund seconded. All voted; motion carried.

VIII. **Annual Evaluation of District Rules on Prevention of Groundwater Waste:** After review, Vice-President Raun made a motion to approve the evaluation as presented. Director Berglund seconded. All voted; motion carried.

IX. **Review and Propose 2018-2019 Budget:** Mr. Hudgins presented and discussed the preliminary 2018-2019 budget. Director Berglund made the motion to propose the 2018-2019 budget as presented which would necessitate a Tax Rate of $0.0083/100 valuation. Director Wittig seconded. All voted for; motion carried.

X. **Review and Propose 2018-2019 Tax Rate:** Director Berglund made a motion to propose a Tax Rate of $0.0083/100 valuation. Vice-President Raun seconded. All voted for; motion carried.

XI. **Discuss and Review Auditor Proposals:** Mr. Hudgins presented the board with the auditor proposals. After review and discuss, Vice-President Raun made a motion to use Kennemer, Masters & Lunsford. Director Berglund seconded. All voted for; motion carried.

XII. **Review and Discuss Possible Current Investment Options:** Mr. Hudgins presented the board with investment options currently available. After review and discussion, Director Berglund made a motion to move $400,000 from Prosperity Bank accounts to Industry State Bank Certificate of Deposit (11 months @ 2.15%) once Industry State Bank provides verification of pledged securities to cover the total amounts at Industry State Bank. Director Wittig seconded. All voted for; motion carried.

XIII. **Review and Discuss CBGCD Fee Schedule:** Mr. Hudgins presented the board with the current fee schedule. After review and discussion, Director Berglund made a motion to change the wording to reflect the changes to Houston's fee schedule (Change Wholesale Water Rate to Resale Water Rate). Director Wittig seconded. All voted for; motion carried.

XIV. **Review and Discuss CBGCD Rules on Spacing and Screening Requirements:** Mr. Hudgins presented the current spacing and screening rules. Staff will contact the hydrologist and continue the discussion at the next meeting.

XV. **Review and Discuss Possible Joint Funding an Amicus Brief:** No Action

XVI. **Review and Discuss Current AG Opinion Request RE: GCD Authority on Defining Agricultural Irrigation:** Request was presented and discussed; no action.

XVII. **Litigation Update a) City of Conroe, et al v. Lone Star Groundwater Conservation District, et al (District Court) b) Fazzino v Brazos Valley Groundwater Conservation District (District Court):** Greg Ellis updated the board on the current status of the cases.

XVIII. **Legislative Update:** Greg Ellis updated the board on the current legislative meetings and groundwater issues.

XIX. **Possible Future Agenda Items:** None

XX. **Public Comments/Announcements:** None.

XXI. **Set Next Meeting Date and Agenda:** Director Berglund made a motion that the next CBGCD board meeting be set for Tuesday, September 11, 2018 at 8:00 am. Director Wittig Seconded. All voted for; motion carried.

XXII. **Adjournment:** Meeting adjourned at 9:07 a.m.

CBGCD Dedicated to Controlling and Preventing the Waste of Groundwater

When taking action on all proposed permit applications, one of the most important provisions the board of directors of the Coastal Bend GCD considers is whether the proposed use of water is dedicated to a beneficial, non-wasteful use as stated in Section 3.14(b)(2) of the District Rules.

As defined in the Texas Water Code Section 36.001, "Beneficial Use" is the use of groundwater in a non-wasteful manner for on or more beneficial purposes, including but not limited to agricultural use, domestic use, stock-raising, municipal use, mining, industrial use including manufacturing, commercial use, non-agricultural irrigation, recreational use including pleasure uses, oil and gas operations, or other uses including extraction for the purposes of remediation, injection operations, or leachate operations.

IF the intended use of a permitted well ever changes and is no longer considered beneficially used, the District may consider revoking that permit. To make sure you are not using groundwater in a wasteful manner, please review the below definition of waste as defined in the Texas Water Code Section 36.001:

"Waste" means any one or more of the following:

(A) withdrawal of groundwater from a groundwater reservoir at a rate and in an amount that causes or threatens to cause intrusion into the reservoir of water unsuitable for agricultural, gardening, domestic, or stock raising purposes;

(B) the flowing or producing of wells from a groundwater reservoir if the water produced is not used for a beneficial purpose;

(C) escape of groundwater from a groundwater reservoir to any other reservoir or geologic strata that does not contain groundwater;

(D) pollution or harmful alteration of groundwater in a groundwater reservoir by saltwater or by other deleterious matter admitted from another stratum or from the surface of the ground;

(E) willfully or negligently causing, suffering, or allowing groundwater to escape into any river, creek, natural watercourse, depression, lake, reservoir, drain, sewer, street, highway, road, or road ditch, or onto any land other than that of the owner of the well unless such discharge is authorized by permit, rule, or order issued by the commission under Chapter 26;

(F) groundwater pumped for irrigation that escapes as irrigation tailwater onto land other than that of the owner of the well unless permission has been granted by the occupant of the land receiving the discharge; or

(G) for water produced from an artesian well, "waste" has the meaning assigned by Section 11.205

3) Controlling and Preventing Subsidence.

3.1 Objective – Each year, the District will hold a joint meeting with neighboring Groundwater Conservation Districts focused on sharing information regarding subsidence and the control and prevention of subsidence through the regulation of groundwater use.
3.1 Performance Standard – Each year, a summary of the joint meeting on subsidence issues will be included in the Annual Report submitted to the Board of Directors of the District.

3.2 Objective – Each year, the District will provide one article annually on the District's website to educate the public on the subject of subsidence.
3.2 Performance Standard – The Annual Report submitted to the Board of Directors will include a copy of the article posted on the District's website.

On August 15, 2018 Neil Hudgins CB/CPGCD General Manager and Mike Turco, Harris Galveston Coastal Subsidence District General Manager held a conference call to discuss the current events of each district to achieve compliance with our Mgmt Plan. Mr. Hudgins and Mr. Turco discussed the opportunities that HGCSD offers in contracting for subsidence monitoring but thus far, CBGCD/CPGCD have not yet installed a subsidence measurement station which can be very costly.

During the meeting, Mr. Hudgins and Mr. Turco navigated each other's websites and showed each other where important information can be obtained. The conversation lasted approximately 20 minutes with each person to be available to come to each other's district should their boards wish to learn more about each District.

CBGCD/CPGCD both have links to the Harris Galveston Coastal Subsidence District and the USGS where vast articles of subsidence can be found

Harris-Galveston Subsidence District (http://hgsubsidence.org/)

Colorado County Groundwater Conservation District (http://www.ccgcd.net/)

Rainwater Harvesting and Lake Revival (http://www.rainwaterharvesting.org/)

USGS Groundwater Information (http://water.usgs.gov/ogw/subsidence.html)

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

4.1 Objective – Each year the District will inquire to the Texas Railroad Commission asking whether any new salt water or waste disposal injection wells have been permitted by the Texas Railroad Commission to operate within the District.
4.1 Performance Standard – Each year a copy of the letter to the Texas Railroad Commission asking for the location of any new salt water or waste disposal wells permitted to operate within the District will be included in the Annual Report submitted to the Board of Directors of the District along with any information received from the TRC.

4.2 Objective – Each year the District will request the Texas Railroad Commission to provide a copy of the results of integrity tests performed on salt water or waste disposal injection wells permitted by the Texas Railroad Commission to operate within the District.
4.2 Performance Standard – Each year a copy of the letter to the Texas Railroad Commission requesting the results of the integrity testing performed on salt water or waste disposal injection wells permitted by the Texas Railroad Commission to operate within the District will be included in the Annual Report submitted to the Board of Directors of the District along with any information received from the TRC.

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COASTAL BEND GROUNDWATER CONSERVATION DISTRICT

109 E. Milam
P.O. Box 341
Wharton, TX 77488

(979) 531-1412
(979) 531-1002 Fax

thedistrict@cbgcd.com
www.cbgcd.com

September 10, 2018

Texas Railroad Commission

P.O. Box 12967

Austin, TX 78711-2967

In accordance with our Groundwater Management Plan, the Coastal Bend Groundwater Conservation District is in need of the locations of any new salt water and waste disposal wells in Wharton County from October 1, 2017 through September 30, 2018.

I would like to request a copy of these locations for submittal to our Board of Directors in our Annual Report.

If you have any questions, please contact our office. Thank you for your assistance in this matter.

Best Regards,

Neil Hudgins

CBGCD General Manager

COASTAL BEND GROUNDWATER CONSERVATION DISTRICT

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Wharton, TX 77488

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(979) 531-1002 Fax

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www.cbgcd.com

September 10, 2018

Texas Railroad Commission
P.O. Box 12967
Austin, TX 78711-2967

In accordance with our Groundwater Management Plan, the Coastal Bend Groundwater Conservation District is in need of integrity test results performed on all salt water and waste disposal wells permitted through the Texas Railroad Commission in Wharton County from October 1, 2017 through September 30, 2018.
I would like to request a copy of these results for submittal to our Board of Directors in our Annual Report.
If you have any questions, please contact our office. Thank you for your assistance in this matter.

Best Regards,

Neil Hudgins
CBGCD General Manager

The Texas Railroad Commission did not provide any information from our request. However, CBGCD/CPGCD have found the TRC website to be useful in researching locations for old gas wells and pipeline information.

5) Conjunctive Surface Water Management Issues.

5.1 Objective – Each year, the District will participate in the regional planning process by attending 50% of the Region K and Region P Regional Water Planning Group meetings to encourage the development of surface water supplies to meet the needs of water user groups in the District.
5.1 Performance Standard – The percentage of meetings attended by a District representative at the Region K and Region P Regional Water Planning Group meetings will be noted in the Annual Report presented to the District Board of Directors.

Daniel Berglund, a Director for the Coastal Bend GCD also represents Small Business on the Lower Colorado Regional Water Planning Group.

The following sets of minutes show that Mr. Berglund participated in at least 50% of the Region K RWPG meetings.

Minutes
Lower Colorado Regional Water Planning Group Regular Meeting
October 11, 2017
LCRA Dalchau Service Center
3505 Montopolis Drive
Austin, Texas
10:00 a.m.

Members Signing In:

Daniel Berglund, Small Business
Jim Brasher, GMA 15
John Burke, Water Utilities
John Dupnik, GMA 10
Ron Fieseler, GMA 9
Lauri Gillam, Municipalities
Karen Haschke, Public Interest
Barbara Johnson, Industries
Donna Klaeger, Counties
Jason Ludwig, Electric Gen. Utilities
Teresa Lutes, Municipalities
Ann McElroy, Environmental
David Lindsay, Recreation, Alternate
Mike Reagor, Municipalities
Robert Ruggiero, Small Business
Paul Sliva, Agriculture
James Sultemeier, Counties
Mitchell Sodek, GMA 8, Alternate
Byron Theodosis, Counties
Paul Tybor, GMA 7
David Van Dresar, Water Districts
Jennifer Walker, Environmental
David Wheelock, River Authorities
Russ Robertson, Non-Voting TDA
David Bradsby, Non-Voting, TPWD
Lann Bookout, Non-voting, TWDB

Voting Members Absent:

Doug Powell, Alternate Attended
Billy Roeder, Agriculture
GMA 8 Member, Alternate Attended
Jim Totten, GMA 12

Consultants/Support/Visitors/Other:

Christianne Castleberry, Water Utilities Alternate
Jaime Burke, AECOM, Reg. K consultant
Jeff Fox, COA, Municipalities, Alternate
Helen Gerlach, Austin Water
Marisa Flores Gonzalez, Austin Water
Tommy Koch
Jo Karr Tedder, CTWC
David Villarreal, TDA
Stefan Schuster, SWCA
Charlie Flatten, Environmental, Alternate
Linda Raschke, Counties, Alternate
Neil Hudgins, Coastal Bend GCD
Ken Cunningham, STP Nuclear Op. Co.
Christiane Alepuz, CAPCOG
Micah Grau, City of Buda

Quorum:

Quorum: Yes
Number of voting members or alternates representing voting members present: 23
Number required for quorum per current voting membership of 25: 13

Formal Actions Taken:

1. Meeting minutes from the July 12, 2017 regular meeting were approved as presented.

Regular Meeting:

1. **Call to Order** – Chairman John Burke called the meeting to order at about 10:03 am.
2. **Welcome and Introductions** – Chairman John Burke welcomed all to the meeting.
3. **Receive public comments on specific issues related to agenda item #8** – None
4. **Attendance Report** – Teresa Lutes called attention to the attendance report that was included in the members' packets.
5. **Consent Agenda:**
    a. Approval of Minutes from the July 12, 2017 regular meeting – A motion to approve minutes from the regular July 12, 2017 meeting as presented was approved.
    b. Financial/Budget Report – David Wheelock reported the Consultant budget is now authorized for $418,201, with $63,427 having been spent and a remaining balance of $354,774. Mr. Wheelock also reported that the grant account balance is currently $83,144 and the Members account has a balance of $3,568.
6. **Texas Water Development Board (TWDB)**
    a. Update on Region K water planning and schedules – Lann Bookout gave an update on regional water planning activities. The Creedmoor-Maha Water Supply Corporation (WSC) minor amendment was approved by the TWDB and will be added to the 2017 State Water Plan (SWP). Open Meetings Act training must be completed by all members of the RWPG by the end of November. New rules from TWDB rulemaking process will be published by approximately Dec. 2017/Jan. 2018, at which point the official comment period will open. However, if people have comments they would like to submit now, they can email Temple McKinnon with TWDB.

    Regarding schedules, the updated water user group (WUG) list is due to TWDB in November. Population and water demand revision requests are due to the board January 12, 2018, but the sooner they can be submitted, the better. The next phase of the process will be water supply analysis. Some things to consider as that process is started are that new rules require identification of potentially feasible projects in a public meeting, a list of major water providers will need to be identified, and that hydrologic variance requests need to be submitted if the Regional Water Planning Group (RWPG) is using any modeling variances or changing anything from the standard required water supply analysis; those requests need to be completed and approved before the Group can move forward with analysis (approval may take up to 60 days).

    Barbara Johnson asked if members who have not completed the Open Meetings Training were aware that they still need to complete it, and asked what the consequences were for failing to complete the training. Jeff Fox

responded that the members who still need to take the training have all been notified, and John Burke said that if the training is not completed by the deadline, the person can no longer be a member of the RWPG. Lann mentioned that there is an Open Meetings Act book that can answer many questions members have about the new rule.

Ms. Johnson also asked if TWDB had discussed declaring the recent drought a new drought of record (DOR), or if that was up to the RWPG. Mr. Bookout responded that decisions of that nature would be made by the planning group, and that other regions have done so. Ms. Johnson followed up by asking if a declaration of a new DOR would trigger an adjustment of the firm yield of the Highland Lakes system; Mr. Bookout replied that a new DOR would require the modeling to be adjusted to incorporate that, which would be a hydrologic methods variance which the RWPG would have to submit to TWDB. Teresa Lutes suggested holding a Water Modeling committee meeting to provide additional time to delve into these aspects further, and it was decided that one should be held soon.

John Dupnik then asked Mr. Bookout if TWDB would be providing the RWPG with any more detail about the new rules put in place by the legislature, such as S.B.1511, which requires identification of whether or not water supply strategies were implemented and evaluation of infeasible projects. Mr. Bookout mentioned that TWDB is just finishing up their guidance documents on the Open Meetings Act, but if any guidance documents on the other new rules are produced, the RWPG members would receive an email.

7. **Consultant Status Report** – Jamie Burke with AECOM gave the status report. Ms. Burke began by informing the RWPG that all tasks are at least partially funded now, so AECOM can begin work on all aspects of the project. Since the last planning meeting, AECOM has been focused on population and demand projections; they have been keeping track of revision requests and prepared materials for the Population and Water Demand Committee meeting. In addition to their work on the projections, AECOM submitted the AquaTexas-Rivercrest sub-Water User Group (WUG) request to TWDB. Jaime informed the group that the Sweetwater Collective Reporting Unit (CRU), which was discussed at the last meeting, now has a public water system ID and more documentation. AECOM also presented a Region K status update to the Capital Area Council of Governments (CAPCOG) Exploratory Water Committee. Additionally, AECOM asked West Travis County Public Utility Agency (PUA) whether they would be interested in being considered for inclusion in the regional plan process as a wholesale water provider, to which they responded yes. AECOM also had a conference call with TWDB and reported that Creedmoor-Maha Water Supply Corporation's (WSC's) minor amendment request was approved by TWDB.

   AECOM's upcoming tasks will include additional work with Population and Water Demand Committee to finalize any revision requests for the RWPG to consider for approval, work on hydrologic analyses, and identifying potentially feasible water supply strategy projects.

8. **Population and Water Demand Committee Report** – Jaime Burke of AECOM stated that the goal for this item is to go over all the requested revisions and Population and

Water Demand Committee recommendations, but not necessarily vote on items during this meeting unless the RWPG felt it would be appropriate at this time. Any revision requests must be considered by the RWPG at the January 10th Region K meeting in order for them to be submitted to TWDB before the deadline. So, there is another opportunity at the January 10, 2018 meeting for the RWPG to vote on all of the items to be considered then. Ms. Burke invited all members to share their thoughts on the requested revisions by sending an email or participating in the Committee meetings.

a. Summary of committee meeting held September 14, 2017 – Lauri Gillam gave a summary of the Population and Water Demand Committee meeting that was held last month. Eight members were in attendance, and there were representatives from LCRA, TWDB, and Texas Department of Agriculture present. She thanked David Wheelock and Daniel Berglund for their work on preparing a new irrigation demand methodology for review and consideration, and stated that the Committee would be meeting again in mid-to-late October to continue working on the draft projections. Jaime added that the TWDB staff present were able to answer many of the Committee's questions, and that the Committee was able to come to a consensus on several items to bring forward to the RWPG.

b. Presentation of Population and Municipal Demand project requested revisions and the Committee's recommendations for changes to submit to TWDB. RWPG to consider and take action, as needed – Jaime Burke from AECOM presented this information. Thus far, 66 out of 114 WUGs (58%) have provided feedback on the draft population and municipal demand projections. Thirty seven WUGs are not requesting any changes, 4 have changes that affect another region, 6 have made contact but have not provided feedback, and 19 are requesting changes that affect Region K. A packet with the summarized feedback from the WUGs was provided to RWPG members. Jaime then went through the requested changes county-by-county. Bastrop, Blanco, Colorado, Gillespie, Llano, Matagorda, and Mills Counties did not have any requests regarding the draft population and municipal demand projections.

   In Burnet County, Granite Shoals, Meadowlakes Municipal Utility District (MUD), and Bertram requested changes resulting in a net decrease in the population of Burnet County. In Fayette County, Fayette County water Control and Improvement District (WCID) Monument Hill requested an increase in population so that projections match water use reports submitted to the Fayette County Groundwater Conservation District. Fayette County WCID Monument Hill also requested a slight increase in 2020 population and an increase in the base water use in gallons per capita per day (GPCD) to reflect 2011 water use. The Population and Water Demand Committee recommended these requests for approval by the RWPG.

   In Hays County, the City of Austin, Dripping Springs Water Supply Corporation (WSC), and West Travis PUA all requested changes. The WUGs will be providing additional information before a final recommendation will be made by the Committee. In San Saba County, North San Saba WSC requested a small

increase in population based on the expectation that some second homes will become permanent retirement homes. The Committee is recommending this North San Saba WSC revision request for RWPG consideration even though was a lack of documentation associated with the request, which the TWDB will be aware of in its consideration of the request if the planning group approves submittal of this WSC's request.

In Travis County, 14 WUGS requested changes; all need to provide additional information before the Committee can make a recommendation to the Group. The City of Austin provided a draft revision request document with supporting information for their request. In Wharton County, the City of Wharton requested a significant increase in population. However, the Committee does not recommend requesting revision of Wharton's projections due to the lack of supporting documentation. In Williamson County, the City of Austin and Wells Branch MUD requested changes; AECOM will also coordinate associated Travis County component recommendations, as appropriate, since these two WUGs are located in two counties.

During the presentation of requests by County, Donna Klaeger asked if an increase in mining demand may be appropriate in Burnet County to balance potential decreases in municipal demand. Jaime responded that typically the process does not allow for such balancing across water use categories. Jennifer Walker asked if we can move population from one County to another; Jaime responded that this can be considered as long as the total Region K population projection totals stay the same. Teresa Lutes mentioned a proposed 1.5% increase to the population of Travis County discussed at the Committee meeting and pointed out that it would not meet all the requested revisions for Travis County. Lann Bookout mentioned that all TWDB projections would be updated in the next planning cycle because there would be new census data to work with, and Teresa mentioned that Austin Water is working on their own Integrated Water Resources Plan in parallel with the Region K planning process that also addresses planning for future water supplies.

Next, Jaime presented the new utility-based GPCD numbers. These were different than the ones sent out with the draft projections, which were county-based (as in the last planning cycle). Jaime pointed out that the change from county to utility boundaries produced new GPCD values for several WUGs, and suggested that wherever the GPCD values were different the RWPG consider using the utility-based values. There were several questions about how the new utility-based GPCDs were calculated, so Jaime explained using Horseshoe Bay as an example. There was additional discussion about whether or not to use these new GPCD values and whether or not 2011 was a representative water use year for all WUGs; the group decided to revisit the issue in January when the full set of Population and Water Demand Committee recommendations are planned to be presented.

c. <u>Presentation of non-Municipal Demand projection requested revisions and the Committee's recommendations for changes to submit to TWDB. RWPG to consider and take action, as needed</u> – Jaime Burke of AECOM first presented

the livestock demands. Ron Fieseler had submitted comments about the livestock demand in Blanco County. TWDB staff and the Committee currently lacks supporting documentation for livestock demand revisions in any county.

The steam-electric demands were presented next. In Llano County, a mistake was made in the original projections so that they were based on consumptive use rather than on diversions from the river; the RWPG will need to submit a request to TWDB to get the values corrected. A request also needs to be submitted to revise Wharton County's steam-electric demands, as one of the Region K facilities there was being counted in Region P. Jennifer Walker asked about the dramatic increase in the Hays County steam-electric demand in 2013; that growth will be discussed in the next Population and Water Demand Committee meeting.

The initial TWDB mining demand projections presented were identical to projections from the 2017 State Water Plan (SWP). The Burnet County Groundwater Conservation District (GCD) submitted comments that the projected demands were reasonable. TWDB staff have acknowledged there were incorrect Water User Survey (WUS) data entries for 2014 and 2015 demands in Matagorda County; the RWPG will need to request a revision to correct that error. Based on discussion, the Committee thinking was that it would be unlikely that there would be increased water use for mining in Bastrop over the next 50 years, so the Region K consulting team indicated that they would work together to develop revised projections for consideration by the RWPG.

The methodology for calculating projected manufacturing demands has changed since the last cycle; the new methodology looks at peak use from the last five years with complete data, applies a growth rate based on Texas Workforce Commission employment projects from 2020 to 2030, and then holds projections constant from 2030 to 2070. Jaime suggested that revision requests to these projected demands might be appropriate, because since the last Region K meeting TWDB has provided a dataset of "potential unaccounted manufacturing water use" which would change the peak manufacturing demand for some WUGs. Additionally, the City of Austin has requested a revision that takes into account their projections of manufacturing growth throughout the planning horizon rather than just between 2020 and 2030. No action was taken; the Population and Water Demand Committee will discuss the matter further when they meet.

Irrigation projections were presented next. At the last Committee meeting, there was discussion about the increasing trend in Travis County irrigation demands; TWDB has since discovered an error in the historical data used for the projections that accounts for the trend. The RWPG would need to request a downward revision of the irrigation demand to correct the error. The Committee also discussed the drastically variable historical surface water use which was used as the basis for the irrigation projections. The Committee came to consensus that the average of 2010-2014 surface water irrigation demands was not representative of a high-use year due to curtailment in years 2012-

2015, which included drought years. At the direction of the Committee, David Wheelock and Daniel Berglund developed proposed revised irrigation projections using a new methodology which looked at the planted acreage, irrigation rates, and canal losses. A packet provided to the members summarized the proposed new methodology and projections. Mr. Berglund cautioned that Region K could see an increase in planted acreage (and therefore higher water use) if proposed rules affecting farm subsidies are put into effect. Ann McElroy asked what water saving conservation measures were considered in this analysis; Mr. Berglund mentioned laser land leveling, new planting tools like no-till drills, and greater accountability due to LCRA metering and surcharging, are examples. David Lindsay complimented Mr. Wheelock and Mr. Berglund on their work and asked for confirmation that these proposed new projections would be taken back to the Committee for discussion. This was affirmed. Donna Klaeger asked if LCRA had a plan to reduce canal losses; David Wheelock said there were no specific plans in place for canal loss reduction because of the expense, but the Gulf Coast irrigation division is using gated structures which will allow better accounting to see where most of the loss occurs. Mr. Berglund pointed out that some of the biggest canal losses occur during rain events and are uncontrollable; David Wheelock mentioned that LCRA has proposed a small balancing reservoir to help mitigate some of those losses. Mr. Wheelock also pointed out that the new projections are based on LCRA irrigation divisions, and still need to be divided into County-level amounts through the Population and Water Demand Committee process.

d. Identification of remaining potential revisions that the Committee will need to consider before bringing recommendations to the RWPG in January – Jaime mentioned several revisions that will need to be reviewed by the Committee before the January meeting, including the City of Bertram requests in Burnet County, the City of Austin requests, and the other non-municipal demands projections.

9. **Other Committee Reports as needed** – John Burke announced that Barbara Johnson had volunteered to chair the Nominating Committee, and asked four other members to serve on the Committee. Jennifer Walker, Karen Haschke, Jim Brasher, and Ann McElroy volunteered.

10. **Agenda items for next meeting**

    a. Location of next meeting – The location and date of the next regular meeting will be at LCRA's Dalchau Service Center in Austin on January 10, 2018 at 10:00 a.m.

    b. Committee Meetings – Population and Water Demand Committee and Water Modeling Committee to meet before full RWPG meeting in January

11. **New / Other Business** – None.

12. **Public Comments** – None.

13. **Adjourn** – The meeting was adjourned at approximately 12:15 pm.

Lower Colorado Regional Water Planning Group
Population and Water Demand Committee Meeting
City of Pflugerville, City Council Chambers
October 31, 2017

1. Lauri Gillam called meeting to order at 10:15 a.m.

2. Attendees (21)
   Lauri Gillam – Region K Population and Water Demand Committee Chair, Small Municipalities Rep
   David Wheelock –Region K, River Authority Rep
   John Burke – Region K, Water Utilities Rep
   Daniel Berglund – Region K, Small Business Rep
   Ann McElroy – Region K, Environmental Rep
   David Lindsay – Region K, Recreation Rep (Alternate)
   Jeff Fox – Region K, Municipalities Rep (Alternate)
   Charlie Flatten – Region K, Environmental Rep (Alternate)
   Linda Raschke – Region K, Counties Rep (Alternate)
   Lann Bookout – TWDB (Region K non-voting member)
   Jaime Burke – AECOM
   Alicia Smiley – AECOM
   James Kowis – James Kowis Consulting, LLC
   Yun Cho – TWDB
   Stacy Pandey – LCRA
   Rebecca Batchelder – LCRA
   Helen Gerlach – Austin Water
   Heather Cooke – Austin Water
   Christianne Castleberry – Castleberry Engineering / Region K, Water Utilities Rep (Alternate)
   Cindy Smiley – Smiley Law Firm
   Earl Foster – Lakeway MUD

3. Public Comments
   a. No public comments.

4. Discuss meeting objectives – Jaime Burke – Meeting objective to discuss all potential revisions and determine recommendations to make to the RWPG.
   a. Draft Population, GPCD, and Municipal Demand projections
   b. Non-municipal demand projections
      i. Irrigation Demands
      ii. Manufacturing Demands
      iii. Steam-Electric Demands
      iv. Mining Demands
      v. Livestock Demands

5. Discuss Draft Population, GPCD, and Municipal Demand projections and potential revisions by county, as needed. Identify recommendations to make to the entire RWPG. – Jaime Burke

a. Potential revisions for counties and WUGs. WUGs shared with Region G and Region L will not be changed based on utility GPCD vs. city GPCD. Revisions to GPCD are generally only recommended if 10 GPCD or greater, unless specifically requested.
b. If there are significant decreases, based on a recommended change to GPCD, a notification will be sent to the utility regarding the change in order to provide an opportunity to comment before the January Region K meeting.
c. Bastrop County
    i. City of Bastrop - recommended decreased demands. (utility GPCD vs. city GPCD)
    ii. Bastrop County-Other - recommended decreased demands. (utility GPCD vs. city GPCD)
d. Blanco County
    i. City of Blanco - recommended decreased demands. (utility GPCD vs. city GPCD)
e. Burnet County
    i. City of Bertram – no revisions to demand since no information was received.
    ii. City of Burnet - recommended decreased demands. (utility GPCD vs. city GPCD)
    iii. Chisholm Trail SUD – request name change to Georgetown, as confirmed by Region G.
    iv. Cottonwood Shores - recommended increased demands. (utility GPCD vs. city GPCD)
    v. Burnet County-Other – The population and demands increase for Burnet County-Other to balance population decreases for Granite Shoals and Meadowlakes MUD, in order to keep the County population constant. The Committee agreed to recommend.
    vi. City of Granite Shoals - requested a population decrease and demand decrease. The Committee agreed to recommend.
    vii. City of Horseshoe Bay - recommended decreased demands (also in Llano County). (utility GPCD vs. city GPCD)
    viii. Kingsland WSC - recommended increased demands (also in Llano County). (utility GPCD vs. city GPCD)
    ix. Meadowlakes MUD - requested a population decrease due to buildout capacity and demand decrease. The Committee agreed to recommend.
f. Colorado County
    i. City of Weimar - recommended decreased demand. (utility GPCD vs. city GPCD)
g. Fayette County
    i. Fayette County-Other – recommended slight decrease in population to balance Fayette County WCID Monument Hill, and increased demand. (utility GPCD vs. city GPCD)
    ii. Fayette County WCID Monument Hill - requested to correct GPCD and demands to reflect historical data, and slightly increase 2020 population. The Committee agreed to recommend.
    iii. Fayette WSC - recommended increased demand. (utility GPCD vs. city GPCD)
    iv. City of La Grange - recommended increased demand. (utility GPCD vs. city GPCD)
h. Gillespie County – No revisions.
i. Hays County
    i. City of Austin - requested overall large population and water demand increase. A small portion of that increase is recommended to be added to the Hays County portion of the City of Austin. City has also requested to increase their GPCD to reflect the utility-boundary number. The Committee agreed to recommend.

ii. Hays County-Other – Recommend population decreases to balance increases for City of Austin and Dripping Springs WSC, in order to keep County total unchanged. Population decreases also decrease demand.
iii. Dripping Springs WSC - requested large population and resultant water demand increase. The WSC has documentation of existing population as well as current and pending development projects to support faster growth. The Committee agreed to recommend.
iv. West Travis County PUA – requested decreased retail population in Hays County and increased retail population in Travis County. Decreases incorporate that the overall population numbers WTCPUA requested include wholesale customers such as Dripping Springs WSC. Committee agreed to recommend. Also recommended decreased demands (utility GPCD vs. city GPCD). See also Travis County

j. Llano County
   i. City of Horseshoe Bay - recommended decreased demands (also in Burnet County). (utility GPCD vs. city GPCD)
   ii. Kingsland WSC - recommended increased demands (also in Burnet County). (utility GPCD vs. city GPCD)
   iii. City of Llano - recommended decreased demands. (utility GPCD vs. city GPCD)
   iv. Sunrise Beach Village - recommended increased demand due to irregular source year for 2011. (utility GPCD vs. city GPCD) Linda Raschke is reaching out to mayor.
k. Matagorda County
   i. Markham MUD - recommended decreased demand. (utility GPCD vs. city GPCD)
   ii. Matagorda County WCID 6 - recommended decreased demand. (utility GPCD vs. city GPCD)
   iii. City of Palacios - recommended decreased demand. (utility GPCD vs. city GPCD)
l. Mills County – No revisions.
m. San Saba County
   i. North San Saba WSC – requested population and demand increase, but lacked any documentation. Committee recommends no revision due to lack of documentation.
   ii. Richland SUD - recommended increased demands. (utility GPCD vs. city GPCD). Region F is in agreement.
   iii. City of San Saba - recommended decreased demand in order to keep with methodology. (utility GPCD vs. city GPCD). Will reach out to San Saba for feedback.
n. Travis County
   i. Because Travis County is growing faster than predicted and Region K is 1.5% underprojected, committee will request to TWDB that the excess 1.5% (approximately 23,000 people in 2015) of population be added to Travis County.
   ii. Aqua Texas-Rivercrest is a sub-WUG to County-Other. Population and demand projections have been developed as part of the revision request to TWDB.
   iii. City of Austin - requested increase in population, based on the City demographer's projections. Committee is able to recommend some increase, based on the overall Travis County population increase, but not all. City also requested to increase GPCD from 156 to 162 GPCD, based on utility GPCD number. Committee agreed to recommend. The RWPG may consider action to support the

City of Austin submitting a separate request to the TWDB for their full projected population numbers.

iv. Barton Creek West WSC - recommended increased demand. (utility GPCD vs. city GPCD)
v. Barton Creek WSC - recommended increased demand. (utility GPCD vs. city GPCD)
vi. Cottonwood Creek MUD 1- recommended decreased demand. (utility GPCD vs. city GPCD)
vii. Travis County-Other used to balance county population projections, but adjusted to keep some population in the County in each decade.
viii. Hurst Creek MUD - recommended increased demand. (utility GPCD vs. city GPCD)
ix. Jonestown WSC - recommended increased demand. (utility GPCD vs. city GPCD)
x. City of Lago Vista - requested an increase in population. Committee recommended staying with draft numbers due to lack of documentation.
xi. Lakeway MUD - requested decreased population and demand, based on data they provided. Committee agreed to recommend decreases.
xii. City of Leander - requested increased population for 2020 and 2030 and requested decreased population for 2040-2070. Also requested increased GPCD, based on 2015 rate. Coordination with Region G and TWDB staff has occurred. Committee agreed to recommend revisions.
xiii. Manville WSC requested decreased population, based on information provided to Region K by Region G staff. Lower demands reflect population changes. Committee agreed to recommend revisions.
xiv. North Austin MUD 1- recommended increased demand. (utility GPCD vs. city GPCD)
xv. Oak Shores Water System - requested increased population and demand for 2020 and 2030 and requested decreased population and demand for 2040-2070. Small changes based on anticipated growth and buildout conditions.
xvi. City of Pflugerville - requested decreased population and demand. Committee agreed to recommend.
xvii. Rough Hollow in Travis County CRU (new WUG) – no recommendations to change numbers, just providing draft numbers for information.
xviii. Shady Hollow MUD - recommended increased demand. (utility GPCD vs. city GPCD)
xix. City of Sunset Valley- requested decreased population, providing calculations. Committee agreed to recommend. Also recommending increase to GPCD. (utility GPCD vs. city GPCD)
xx. Sweetwater CRU (new WUG) – no recommendations to change numbers, just providing draft numbers for information.
xxi. Travis County MUD 10 - recommended decreased demand. (utility GPCD vs. city GPCD)
xxii. Travis County MUD 2 - recommended decreased demand. (utility GPCD vs. city GPCD)
xxiii. Travis County MUD 4 - recommended decreased demand. (utility GPCD vs. city GPCD)
xxiv. Travis County WCID 10 - recommended increased demand. (utility GPCD vs. city GPCD)
xxv. Travis County WCID 17 – requested increase to 2020 population, based on 2016 population submitted to TWDB. Committee agreed to recommend. Also recommended increased demand. (utility GPCD vs. city GPCD)
xxvi. Travis County WCID 19 - recommended decreased demand. (utility GPCD vs. city GPCD)
xxvii. Travis County WCID 20 - recommended decreased demand. (utility GPCD vs. city GPCD)

xxviii. Travis County WCID Point Venture - requested increased population in 2020 based on 2015 population and current growth rates. 2030 population was then adjusted to better balance the growth between 2020 and 2040. 2040 – 2070 population was not changed. Committee agreed to recommend. Also recommended decreased demand. (utility GPCD vs. city GPCD)

xxix. Wells Branch MUD – requested increased population based on documentation of current single family and multi-family population. GPCD is decreased based on updated population numbers, resulting in decreased demands. Committee agreed to recommend.

xxx. West Travis County PUA - requested increased retail population in Travis County based on demographic study provided. Also requested lower GPCD, which includes both retail and wholesale and is lower than historical data shows for retail. Committee agreed to recommend a portion of the requested increase, based on the increase to Travis County's population. Committee did not agree to recommend requested GPCD, but recommended lower GPCD (utility GPCD vs. city GPCD).

o. Wharton County
   i. Wharton County-Other -recommended increased demand based on Region P request to slightly increase GPCD (utility GPCD vs. city GPCD).

p. Williamson County
   i. City of Austin – initially increased population to reflect moving the County-Other population under City of Austin, based on service area. TWDB asked that we check to see if some population should be left under County-Other. City of Austin is looking at the numbers.
   ii. Williamson County-Other – initially moved all of County-Other population under City of Austin. TWDB asked that we check to see if some population should be left under County-Other. City of Austin is looking at the numbers.
   iii. North Austin MUD 1 - recommended increased demand. (utility GPCD vs. city GPCD)
   iv. Wells Branch MUD - GPCD is decreased based on updated population numbers in Travis County, resulting in decreased demands. Committee agreed to recommend.

6. Discuss Draft Non-Municipal Demand projections and potential revisions by category, as needed. Identify recommendations to make to the entire RWPG. – Jaime Burke
   a. Irrigation Demands
      i. Concern regarding potential overlap / double-counting of irrigators using both surface water and groundwater. Discussion of using a consistent methodology for both water sources, or detailed inventory of groundwater.
      ii. Discussion of Daniel Berglund and David Wheelock's memo that developed proposed new surface water demand numbers for irrigation.
      iii. David Lindsay discussed possible issues with irrigation demand methodology. Discussed 1988 Adjudication Order. Suggested that for planning purposes, Gulf Coast number needs to be decreased, based on 5.25 acre-foot/acre. See separate meeting handout *"Irrigation Demand Metric and Associated Water Conservation Requirements Summary and Excerpts: Court Order from 1988 Adjudication of Water Rights; Certificates of Adjudication held by LCRA; LCRA's Water Management Plans (1989 +)"* for full discussion.
      iv. Committee agreed to schedule another meeting, to be able to discuss materials presented in more detail. No recommendations at this time.

b. Manufacturing Demands
    i. Discussion of "potential unaccounted manufacturing water use" data for 2015, provided by TWDB staff. Looked at what counties might have increased demands based on the addition of that data. Six counties would have increased demands that could be requested as revisions to the TWDB.
    ii. Discussion of City of Austin manufacturing increases for Travis County, based on their projected employment in the manufacturing sector from the City Demographer. The Committee had some concerns that there was a large jump in demand from 2030-2040 that wasn't well explained.
    iii. Committee agreed to recommend revisions for all six counties, except for Travis County. The City of Austin will take another look at their numbers, which will be considered at the next Committee meeting.
c. Steam-Electric Demands
    i. Llano County
        1. David Wheelock will submit request at next meeting.
    ii. Wharton County
        1. Moving portion of demand from Region P to Region K, based on accidentally being located in the incorrect region.
d. Mining Demands
    i. Bastrop County
        1. News article said mine was to be closed. Leaving revision request as-is for now.
e. Livestock Demands
    i. No comments.

7. Summarize recommendations to make to RWPG at January 10th meeting.
    a. Need additional discussion on Irrigation, Manufacturing, Steam-Electric, and Municipal (based on changes discussed at meeting and feedback expected from WUGs regarding GPCD change).
        i. A Doodle poll will be sent out to determine next meeting.
        ii. Location: City of Pflugerville.

8. New / Other Business
    a. None.

9. Public Comments – limit 3 minutes per person
    a. None.

10. Lauri Gillam adjourned at 2:40 p.m.

Lower Colorado Regional Water Planning Group
Population and Water Demand Committee Meeting
City of Pflugerville Public Library
December 7, 2017

1. Lauri Gillam called meeting to order at 10:14 a.m.
    a. Lauri Gillam mentioned that when receiving emails, in accordance with the Open Meetings Act requirements, please do not "reply to all." Members of a governing body (i.e. committee members) cannot correspond with one another regarding planning group business outside an open meeting. All correspondence should be sent directly to Jaime Burke.

2. Attendees (23)
    Lauri Gillam – Region K Population and Water Demand Committee Chair, Small Municipalities Rep
    David Wheelock –Region K, River Authority Rep
    John Burke – Region K, Water Utilities Rep
    Daniel Berglund – Region K, Small Business Rep
    Ann McElroy – Region K, Environmental Rep
    David Lindsay – Region K, Recreation Rep (Alternate)
    Teresa Lutes – Region K, Municipalities Rep
    Lann Bookout – TWDB (Region K non-voting member)
    Jaime Burke – AECOM
    Alicia Smiley – AECOM
    James Kowis – James Kowis Consulting, LLC
    Yun Cho – TWDB
    Katie Dahlberg – TWDB
    Stacy Pandey – LCRA
    Rebecca Batchelder – LCRA
    Jeff Fox – Austin Water / Region K, Municipalities Rep (Alternate)
    Helen Gerlach – Austin Water
    Christianne Castleberry – Castleberry Engineering / Region K, Water Utilities Rep (Alternate)
    Cindy Smiley – Smiley Law Firm
    Earl Foster – Lakeway MUD
    Susan Patton – CTWC
    Jo Karr Tedder – CTWC
    Jordan Furnans – LRE Water, LLC

3. Public Comments
    a. No public comments.

4. Minutes Approval
    a. Draft of September 14, 2017
        i. David Wheelock proposed to add note in (5) Non-Municipal Demand Projections that comments had been provided prior to meeting, and the commenters were not necessarily at the meeting.

b. Draft of October 31, 2017
    i. David Wheelock proposed to delete last sentence of (6aii).
    ii. Dave Lindsay proposed to add the following sentence to (6aiii):
    See separate meeting handout "Irrigation Demand Metric and Associated Water Conservation Requirements Summary and Excerpts: Court Order from 1988 Adjudication of Water Rights; Certificates of Adjudication held by LCRA; LCRA's Water Management Plans (1989 +)" for full discussion.
c. John Burke motioned to approve both sets of minutes with the noted changes. David Wheelock seconded. Committee passed.

5. Meeting Objectives
    a. Lauri Gillam commended AECOM for presenting such complicated information and organizing it well for the committee.
    b. The committee needs to finalize and approve recommendation for presentation to RWPG at the January 10, 2018 meeting.
    c. Jaime Burke lead discussion on revising:
        i. Municipal projections based on feedback from October 31st meeting
        ii. Manufacturing Demands for Travis County
        iii. Steam Electric for Llano County
        iv. Irrigation Demands, particularly in:
            1. Colorado County
            2. Wharton County
            3. Matagorda County

6. Municipal projections revisions (as discussed at the October 31st meeting.)
    a. Letters and emails were sent to WUGs whose draft projections have changed based on the utility boundary versus city boundary methodology agreed upon at the October 31st meeting. The following WUGs requested *not* to change their GPCD based on utility boundaries:
        i. Bastrop County-Other
        ii. Kingsland WSC
        iii. City of San Saba
        iv. Travis County WCID 17
        v. North Austin MUD No. 1
        vi. Teresa Lutes motioned to approve requests. John Burke seconded. Committee passed.
    b. Travis County
        i. As a result of Lago Vista not increasing population in draft projection due to lack of sufficient data, unaccounted population was added to City of Austin per request of the City.

ii. City of Austin will revise request to break municipal request into portion that will fit under the population cap that TWDB staff have agreed to consider, and a supplemental request for the additional population that City of Austin actually expects to see. The RWPG will take the municipal requests up as separate agenda items at the January Region K meeting.

iii. Region G and Region K need to coordinate to have the same draft projections for City of Leander. Committee came to a consensus to wait for the City to respond and the Region K planning group will decide on draft projections. This is due to incomplete information from City of Leander as of December 7th.

c. Williamson County

i. Previously, Williamson County-Other population had been revised to zero (0) to reflect moving the entire population under City of Austin. Based on TWDB staff suggestion at October 31st meeting, City of Austin revisited the numbers and determined that 3% of the County-Other population should remain in County-Other. The remaining 97% was moved under City of Austin. This is because while this population may live in the Austin service area, they use wells for water.

d. John Burke motioned to approve changes as noted above. Dave Lindsay seconded. Committee passed.

7. Manufacturing Demands – Travis County

a. City of Austin is requesting revisions to Manufacturing Demand in Travis County in 2040-2070 beyond what the committee agreed to recommend with the incorporation of the 2015 potentially unaccounted for additional manufacturing water use at the October 31st meeting:

i. 2040: 14,853 to 18,299 AFY
ii. 2050: 14,853 to 19,491 AFY
iii. 2060: 14,853 to 20,683 AFY
iv. 2070: 14,853 to 21,876 AFY

b. Teresa Lutes provided additional documentation to back this request in the form of a handout. Main points include:

i. When creating manufacturing demands, the North American Industry Classification System (NAICS) codes used by TWDB does not cover all manufacturing in City of Austin, leaving unaccounted water use in the industrial sector.

ii. Austin Water's disaggregated demand model projects higher estimates of manufacturing demand than TWDB's current projections.

c. TWDB staff asked that City of Austin provide additional data showing how the manufacturing growth will exceed anticipated water use efficiencies. Current trends for the State show water use for manufacturing decreasing even as manufacturing shows growth. City of Austin agreed to provide additional data. David Wheelock motioned to approve City of Austin's Manufacturing Demands projections. John Burke seconded. Committee passed.

8. Steam Electric – Llano County
    a. David Wheelock submitted a letter to Region K and presented the request to the committee to revise projections for Llano County. The 2020 water demands projections were developed for each county by using the highest county aggregated steam-electric power water use from 2010-2014. As the Ferguson Power Plant was under reconstruction during that time, the numbers provided for Llano were under-projected. Using 2015-2016 data, Wheelock proposed to alter the Llano County numbers to 1,748 acre-feet/year.
    b. Committee passed the approval to recommend the requested revision to the Llano County steam-electric demand.

9. Irrigation Demands
    a. Donna Klaeger (Region K, Counties Rep) submitted a letter of support to utilize the 5.25 acre-feet per acre-total water use waste standard requirement as a maximum allowable water usage metric for determining irrigation demand.
    b. Explanation of various source components that make up the irrigation demands in Colorado, Matagorda, and Wharton Counties (surface water for LCRA Irrigation Districts, surface water for other irrigation water rights, and groundwater) and that the Committee would need to choose a methodology for each component in order to determine the revised total by County.
    c. Surface Water for LCRA Irrigation Districts
        i. Discussion of whether demand is at the field or at the point of diversion. Decision that demand is at point of diversion, similar to previous plans.
        ii. Daniel Berglund noted that the total surface water numbers presented in 10/5/17 memo of 419,601 AF is less than 2015 LCRA WMP interim demands of 438,500 AF, and less than the 464,000 AF actually used in 2011.
        iii. Discussion whether 5.25 AF/A is a legal requirement, and that showing demands higher than that allows for wasted water.
        iv. Discussion focusing on 5.25 AF/A requirement for irrigation, rather than historical use, being a different methodology than other water use categories.
        v. Showing historical use shows what happens if nothing changes, and pushes the effort to look at conservation.
        vi. Concern that after 30 years, Gulf Coast Irrigation District has not made effort to reduce water use.
        vii. Conservation projects being done in Gulf Coast with grant funding that is available because of water management strategies listed in the Region K Water Plan.
        viii. Discussion of irrigation demand projections for Colorado, Matagorda, and Wharton counties being flat versus decreasing each decade. Committee fairly comfortable with decadal decrease of 2.69% over planning horizon, which is what Region K used in the last planning cycle.
        ix. Motion made by David Wheelock to recommend to Region K RWPG to accept the surface water numbers in the 10/5/17 memo, as summarized in 12/7/17 meeting

Handout 6 Item 1.a. for the 2020 demand. Include a reduction of 2.69% per decade for future decades. The RWPG will work to identify water management strategies that focus on conservation, along with possible other strategies. Lauri Gillam seconded. Motion passed, Dave Lindsay voted no.

d. Surface Water for other irrigation water rights
    i. Options presented included 1)last cycle's numbers (90th percentile of 2000-2011 water use), 2) 2011 water use, and 3) average of 2010-2014 water use.
    ii. Some concern that Colorado County numbers for the second two options are too low and don't reflect a true demand.
e. Groundwater
    i. Options presented included 1) 2011 water use, and 2) average 2010-2014 water use.
    ii. Some discussion, but no strong opinion for one option versus another.
f. Committee felt that because the TWDB draft projections used an average 2010-2014 water use, they would recommend that method for both the groundwater component and the surface water for other irrigation rights component. Ann McElroy made the motion, David Wheelock seconded, motion passed.
g. Additional Supplemental water discussion. David Wheelock mentioned that although supplemental (non-rice) water use had been included for the Gulf Coast irrigation district numbers, it hadn't been included for Lakeside irrigation district because in 2011, there wasn't a demand at Lakeside. Because there possibly should be, David Wheelock requested that 2,000 acres at 1.2 AF/A be added to the Lakeside irrigation district demand. Committee approved the motion.
h. Committee also approved to apply the 2.69% demand decrease per decade to the entire irrigation demand in Colorado, Wharton, and Matagorda counties.
i. Resulting breakdown of revised irrigation demands by county, and the projection of the 2020 demands out to 2070 – see attached sheet.

10. Additional Discussion
    a. Teresa Lutes wanted to encourage the Committee and the RWPG to take the information regarding irrigation water use that has been presented and discussed, and use it to identify conservation water management strategies in the 2021 Plan that will specifically reduce water demand, acknowledging that the recommended water demands based on historical water use have room for improvement and the region should do what it can to help make that happen. She also wanted to clarify the planning process and how it is broken into steps that are somewhat separate from each other. First step is to identify water demands, based on historical water use or some other determined methodology. Second step is to identify existing available water and supplies during drought conditions, separate from the demands. Third step is to compare the demands and existing water supplies to determine where there are "needs", or water shortages. Fourth step is to identify potential water management strategies, such as conservation or new water supply projects, to help meet the water

shortage. Including strategies/projects in the regional water plans allows the State to help provide financing to implement the projects, and helps to show specifically what projects need to occur in order to increase supply or reduce demand where it's needed.

11. Next meeting
    a. No meeting scheduled

12. New / Other Business
    a. None.

13. Public Comments – limit 3 minutes per person
    a. Jordan Furnans, LRE Water, LLC.
        i. Concerned that the Committee's recommendation of average 2010-2014 water use for the smaller non-LCRA irrigation water rights in the lower basin is not a good representation of normal water demand. Believes that the numbers used in the last cycle (90^{th} percentile of 2000-2011 water use) are a better representation.
        ii. Believes use of 2011 planted acreage for calculating irrigation demands may be too high for future dry-year water demands based on changes to "open supply" concept.
        iii. Subsidence District study is coming out soon

14. Lauri Gillam adjourned at 2:10 p.m.

Irrigation Demand Calculations Based on Committee Recommendations at 12/07/17 Meeting

Irrigation District	Surface Water Demand (AFY)	
	Region K	Region P
Garwood	84,000	16,000
Lakeside*	135,311	
Pierce Ranch	30,000	
Gulf Coast**	156,690	
Total	406,001	16,000

Irrigation District	Surface Water by County in Region K (AFY)		
	Colorado	Wharton	Matagorda
Garwood [1]	84,000	0	0
Lakeside [2]	55,478	79,833	0
Pierce Ranch [3]	0	30,000	0
Gulf Coast [4]		7,835	148,855
Other SW Rights in Lower Basin [5]	94	2,885	8,814
Total	139,572	120,553	157,669

	Groundwater by County in Region K (AFY)		
	Colorado	Wharton	Matagorda
Avg 2010-2014 Use	33,540	60,557	33,919

	Total Demand by County in Region K (AFY)		
	Colorado	Wharton	Matagorda
Revised Projection	173,112	189,110	191,588
Draft TWDB Projection	123,682	147,543	109,595

*Includes 2,400 AF of Supplemental Water (non-rice irrigation)

**Includes 20,024 AF of Supplemental Water (non-rice irrigation)

[1] Region K portion of Garwood is 100% Colorado Co.

[2] Lakeside is 41% Colorado Co., 59% Wharton Co.

[3] Pierce Ranch is 100% Wharton Co.

[4] Gulf Coast is 92% Matagorda Co., 8% Wharton Co.

[5] Surface water rights other than LCRA, STPNOC, & Corpus Christi (TCEQ Water Use Reports Average 2010-2014)

Projections

	Committee Recommended Revisions to Irrigation (AFY)					
	2020	2030	2040	2050	2060	2070
Colorado	173,112	168,455	163,924	159,514	155,223	151,048
Matagorda	191,588	186,434	181,419	176,539	171,790	167,169
Wharton	189,110	184,023	179,073	174,256	169,569	165,008
Total (Lower Basin)	553,810	538,912	524,416	510,309	496,582	483,225
Total (Region K)	582,407	567,509	553,013	538,906	525,179	511,822

Minutes
Lower Colorado Regional Water Planning Group Regular Meeting
January 10, 2018
LCRA Dalchau Service Center
3505 Montopolis Drive
Austin, Texas
10:00 a.m.

Members Signing In:

Daniel Berglund, Small Business
John Burke, Water Utilities
John Dupnik, GMA 10
Ron Fieseler, GMA 9
Lauri Gillam, Municipalities
Dianne Wheeler, Public Interest, Alternate
Jason Ludwig, Electric Generating Utilities
Barbara Johnson, Industries
Donna Klaeger, Counties
Teresa Lutes, Municipalities
Ann McElroy, Environmental
David Lindsay, Recreation, Alternate
Mike Reagor, Municipalities
Robert Ruggiero, Small Business
Mitchell Sodek, GMA 8, Alternate
Jim Totten, GMA 12
Byron Theodosis, Counties
Paul Tybor, GMA 7
David Van Dresar, Water Districts
Jennifer Walker, Environmental
David Wheelock, River Authorities
Russ Robertson, Non-Voting TDA
David Bradsby, Non-Voting, TPWD
Lann Bookout, Non-voting, TWDB

Voting Members Absent:

Jim Brasher, GMA 15
Karen Haschke, Alternate Attended
Doug Powell, Alternate Attended
Billy Roeder, Agriculture
GMA 8 Member, Alternate Attended
Paul Sliva, Agriculture
James Sultemeier, Counties

Consultants/Support/Visitors/Other:

Jeff Fox, COA, Municipalities, Alternate
Jordan Furnans, LRE Water LLC
Ken Cunningham, STP Nuclear Op. Co.
Alicia Smiley, AECOM
Richard Hoffpauir, Hoffpauir Consulting
Jo Karr Tedder, CTWC
Heather Cooke, COA-Austin Water
Walter Couger, TNRIS-ACC
Cindy Smiley, Smiley Law Firm
Kodi Sawin, Sawin Group
Matt Nelson, TWDB
Temple McKinnon, TWDB
Helen Gerlach, COA-Austin Water
Stefan Schuster, HDH
Linda Raschke, Counties, Alternate
Christianne Castleberry, Water Utility Alt.
Charlie Flatten, Environmental, Alternate
David Dehal
David Villarreal, TDA
Vicky Kennedy, Travis County

Quorum:

Quorum: Yes
Number of voting members or alternates representing voting members present: 21
Number required for quorum per current voting membership of 25: 13

Formal Actions Taken:

1. Meeting minutes from the October 11, 2017 regular meeting were approved as amended.
2. Population and water demand revision request was approved for consultant to submit to TWDB.
3. Additional upward revision request from the City of Austin approved to submit to TWDB.
4. Hydrologic variance requests approved for submittal to TWDB.

Regular Meeting:

1. **Call to Order** – Chairman John Burke called the meeting to order at about 10:09 am.
2. **Welcome and Introductions** – Chairman John Burke welcomed all to the meeting.
3. **Discuss term expiration for several member representatives and take action as needed** – Several members' terms are expiring soon. John Burke stated that members whose terms have expired and would like to serve another term should notify him by email and in writing, and the Regional Water Planning Group (RWPG) will vote on the matter at the next meeting.
4. **Report on Nominating Committee Recommendations** – Barbara Johnson provided a brief summary of the nominating committee meetings, stating that the committee worked to nominate people from all areas of the basin representing a broad range of interests. The committee produced a slate of officers for the Executive Committee, as follows: Chairman: John Burke (representing Water Utilities); Vice Chair: David Wheelock (representing River Authorities); Secretary: Teresa Lutes (representing Municipalities). The three at-large seats are David Van Dresar (representing Groundwater Districts), Mike Reagor (representing Small Municipalities), and Paul Sliva (representing Agriculture). John Burke then asked the Group if there were any other nominations. Barbara Johnson made a motion to accept the composition of the Executive Committee as described, and the motion was seconded and passed.
5. **Receive public comments on specific issues related to agenda items #10-17** – Jordan Furnans made a comment related to water modeling done by the RWPG. He stated that he has performed studies on modeling sedimentation and environmental flows, and both their effects on the firm water available in the WAM are minimal compared to modeling interruptible water. He encouraged the Group to keep in mind the impact of modeling interruptible water on the firm water available.
6. **Attendance Report** – Teresa Lutes called attention to the attendance report that was included in the members' packets.
7. **Consent Agenda:**
    a. Approval of Minutes from the October 11, 2017 regular meeting – David Wheelock asked to add a clarification about irrigation at the bottom of page6/top of page 7. The change was made, and a motion to approve minutes from the regular October 11, 2017 meeting as amended was approved.
    b. Financial/Budget Report – David Wheelock reported the Consultant budget is now authorized for $418,201, with $97,546 having been spent and a remaining

balance of $320,655. David also reported that the grant account balance is currently $57,130 and the Members account has a balance of $3,564.

8. **Texas Water Development Board (TWDB)**

   a. Update on regional water planning activities and schedules – Lann Bookout said that the rulemaking process at TWDB has opened up and the comment period closes at the end of January. Revision requests for the population and water demand projections are due January 12, 2018. TWDB will consider those requests in April. Lann also stated that there will be a contract amendment in March that the group needs to consider for approval, so it should be added to the agenda. In the near future, the RWPG will also need to choose a process for identifying potentially infeasible projects to comply with the new TWDB rules.

9. **Consultant Status Report** – Jaime Burke from AECOM presented the consultant status report. Since the last meeting, AECOM worked with the Population and Water Demand Committee to present final the population and water demand revision requests to the Group for consideration. Pending Group approval, AECOM plans to submit the requests to TWDB before the January 12th deadline. AECOM has also worked with the Water Modeling Committee and prepared hydrologic variance requests to submit to TWDB pending Group approval. In addition to the submittal of revision and variance requests to TWDB, upcoming effort for AECOM includes updating water availability and supply numbers for Water User Groups (WUGs), working with the Water Management Strategies Committee to identify any needed changes in process and discuss a method for determining potentially feasible projects, beginning data entry to TWDB's DB22 database, and preparing relevant chapter text updates.

10. **Population and Water Demand Committee Report –**

    a. Summary of committee meetings held October 31 and December 7, 2017 – At the October committee meeting, the committee discussed municipal revisions, irrigation demands, steam-electric demands, manufacturing demands, mining demands, and livestock demands. The committee made change suggestions for all demand categories except Livestock Demands (no changes), and there was significant discussion of the irrigation demand projections.

    At the December 7th committee meeting, the group finalized all revision recommendations to bring to the RWPG for today's meeting. A large portion of the discussion was about determining irrigation demand projections.

    During the presentation at the December 7th committee meeting summary, John Dupnik asked about the use of a 5.25-ft/acre limit for irrigation that was discussed at the meeting. David Wheelock explained that although the 5.25-ft/acre is an important number from the adjudication, it was not what he and Daniel Berglund had developed as a recommendation, and explained that they used actual reported irrigation use from recent years to develop their recommended values. Donna Klaeger asked if the 5.25-ft/acre was being used by irrigators currently as a guideline for water use. David Wheelock and Daniel Berglund explained that the actual water use changes every year, but the goal

is to reach an average use of 5.25-ft/acre. Ms. Klaeger followed up by asking if the 5.25-ft/acre value would be used as a water management strategy; Lauri Gillam responded that it had been discussed at the Population and Water Demand Committee meeting and they determined that the 5.25-ft/acre is appropriate for water management strategy analysis. Some additional brief discussion of irrigation demands followed.

b. Approval by Population and Water Demand Committee of Committee meeting minutes from December 7, 2017 – A motion was approved to table the approval of the minutes from the December 7, 2017 Committee meeting until the next RWPG meeting due to the submission of additional edits to the minutes that had not been completely reviewed.

c. Presentation of Committee recommendations for population and water demand revisions for RWPG consideration – Jaime Burke of AECOM presented the recommendations for population and water demand revisions to the RWPG. The revision requests are separated into two memorandums, one for municipal and one for non-municipal. A packet with the summarized feedback from the WUGs was provided to RWPG members. Jaime began by going through the recommended population and GPCD changes county-by-county. Gillespie County and Mills County had no proposed population or GPCD revisions.

   In Bastrop and Blanco counties, the proposed revision was to switch the GPCD from the city-based GPCD to the utility boundary-based GPCD. No population revisions were recommended for those counties.

   In Burnet County, the Committee proposed a population decrease for Granite Shoals and Meadowlakes Municipal Utility District (MUD) based on requested changes. To balance the decrease in population, Burnet County-Other population was increased. The revised GPCD was proposed for the City of Burnet, Cottonwood Shores, and Horseshoe Bay. Additionally, the WUG name for Chisolm Trail SUD was recommended to be changed to Georgetown. Donna Klaegar asked if representatives from Horseshoe Bay had been contacted regarding the proposed GPCD revision; Jaime responded that they had green-lighted the revision.

   In Colorado County, no population revisions were proposed, but it was recommended that the RWPG request use of the revised utility-based GPCD.

   In Fayette County, a population and GPCD revision for Fayette County Water Control and Improvement District (WCID) Monument Hill was recommended. The proposal is to increase 2020 population and increase base water use in gallons per capita per day (GPCD) to reflect 2011 water use. The Fayette County-Other population was decreased to balance the population increase. A recommendation was also made to use the revised GPCD values for Fayette County-Other, Fayette Water Supply Corporation WSC, and La Grange.

   In Hays County, population revisions are proposed for the City of Austin, Dripping Springs WSC and West Travis Public Utility Agency (PUA), and Hays County-Other all requested changes. City of Austin and Dripping Springs WSC would increase their population, while Hays County-Other and West Travis

PUA populations would decrease. A recommendation to use revised GPCDs is also proposed for Austin and West Travis County PUA.

In Llano County, no population revisions are proposed, but revised GPCDs are recommended for Horseshoe Bay and the City of Llano. Mike Reagor suggested using a higher GPCD than the one recommended based on how early in the year Llano imposed drought restrictions. Similarly, in Matagorda County, no population revisions are recommended but use of the revised GPCD is proposed for Markham MUD and Palacios. In San Saba County, there are also no population revision recommendations, but there is a recommendation to use the revised GPCD for Richland SUD.

In Travis County, the Committee recommends requesting an amount equal to 1.5% of the overall Region K population be added to the total Travis County population. Increases in population are recommended for Austin, Leander, Oak Shores Water System, Travis County WCID 17, Travis County WCID Point Venture, Wells Branch MUD, and West Travis County PUA. Decreases in population are recommended for Lakeway MUD, Manville WSC, Pflugerville, and Sunset Valley. Travis County-Other was used to balance the various requests. A GPCD revision is recommended for Austin, Barton Creek West WSC, Barton Creek WSC, Cottonwood Creek MUD, Hurst Creek MUD, Jonestown WSC, Lakeway MUD, Shady Hollow MUD, Sunset Valley, Travis County MUD 10, Travis County MUD 2, and Travis County MUD 4. The Committee also recommends including Aqua Texas-Rivercrest as a sub-WUG to Travis County-Other. Austin is planning on submitting a separate request asking TWDB to increase the overall population of Region K.

In Wharton County, no population revisions were recommended; a revision to Wharton County-Other is recommended for consistency with Region P.

In Williamson County, a population increase for Austin and population decrease for Williamson County-Other is recommended. GPCD revisions are recommended for Austin and Wells Branch MUD.

Jaime then went on to discuss non-municipal demands. There were several minor revisions recommended for mining and steam-electric demands. Manufacturing demands for Bastrop, Fayette, Gillespie, Hays, Travis, and Williamson are recommended to for an upward adjustment to reflect potentially unaccounted for manufacturing water use. Travis County is recommended for an additional upward revision based on City of Austin requested increases.

Irrigation demands for Travis County are recommended for revision to correct data error in historical water use. Revised irrigation demands in Colorado, Matagorda, and Wharton Counties are based on historical usage data and incorporate a 2.69% decrease in total demand each decade.

d. Presentation of minor additional base GPCD revisions that were received after the Committee last met (December 7, 2017), for RWPG consideration – An adjustment to Leander's GPCD, Matagorda County WCID 6's GPCD, and Sunrise Beach Village's GPCD was presented for consideration by the RWPG for inclusion in requested revisions to TWDB (see Agenda Item #11, below).

11. **Discuss and take action to approve population, municipal demand, and non-municipal demand projection revisions to TWDB draft projections, and to authorize consultant to submit revision request to TWDB. Consider authorizing consultant to continue any needed discussions with TWDB regarding the revisions, on behalf of the RWPG.** – Lauri Gillam made a motion to adopt the proposed revisions as edited and revised; the motion was seconded and approved. Lauri also made a motion to allow the consultant to make minor changes and submit the Region K revision requests on behalf of the RWPG; the motion was seconded and approved.

12. **COA Upward Revision Request – Discuss and take action on COA request to incorporate COA forecast for additional population growth for recommendation from the Region K planning group for the COA to submit to TWDB.** – Teresa Lutes from the City of Austin (COA) presented Austin's upward revision request. COA projects significantly higher population growth out to 2070 than TWDB does. The proposal is for the RWPG to consider approval of the COA submitting independently a revision request to TWDB for a population increase to the overall Region K population. After discussion, the motion made by Teresa to submit a separate COA upward population revision request made, seconded, and was approved.

13. **Water Modeling Committee Report** –

    a. Summary of Committee meeting held December 13, 2017 – The Water Modeling Committee met for the first time this planning cycle at the December 13th meeting. At the meeting, the Committee discussed the purpose of the committee, reviewed TWDB guidelines, reviewed key features and assumptions included in the water availability model (WAM) used in the last cycle, identified WAM assumptions that should be updated this cycle, and discussed planning timeline. The Committee decided to hold another Water Modeling Committee meeting immediately before the Region K meeting on January 10th to watch a presentation on the WAM (an overview of the WAM) and make final recommendations to bring to the RWPG.

    b. Informational presentation on surface water modeling and Region K Cutoff Model – Joe Trungale presented several slides on water availability modeling and how the WAM works. Jaime Burke of AECOM then presented on the Region K cutoff model, and explained how it works and why it is used. Both Joe and Jaime answered questions from the group.

    c. Presentation of Committee recommendations for updates to the assumptions incorporated into the Region K Cutoff Model for 2021 Plan development and the associated hydrologic variance request to TWDB, for RWPG consideration – The updated hydrologic variance request to TWDB recommended by the Water Modeling Committee was presented to the group.

14. **Discuss and take action to approve updates to the assumptions incorporated into the Region K Cutoff Model for 2021 Plan development and the associated hydrologic variance request to TWDB, and authorize consultant to submit hydrologic variance request to TWDB. Consider authorizing consultant to**

continue any needed discussions with TWDB regarding the request, on behalf of the RWPG – Teresa Lutes made a motion to approve the Water Modeling Committee recommendation of submitting to TWDB the draft variance request letter and the attachment containing the table of variances presented. The motion was seconded and approved. Teresa also made a motion to authorize the consultant to submit the variance requests to TWDB on the RWPG's behalf. This motion was also seconded and approved.

15. **Discussion of water suppliers, other than LCRA, in Region K that are not included as Water User Groups, but should potentially be included in the 2021 Region K Water Plan as Wholesale Water Providers only. Take action, as needed.** – Jaime Burke gave an overview on the topic. Currently, LCRA is the only wholesale provider in the basin that is not also a Water User Group (WUG). TWDB is asking for the RWPG to identify any other wholesale suppliers in the basin who are not WUGs for inclusion in the 2021 plan. After discussion, the group agreed to have AECOM collect more data and ask for more guidance from TWDB before taking action.

16. **Other Committee Reports as needed** – None

17.

    a. Discuss and take action on requesting written opinion from TWDB or the Texas Attorney General on Regional Planning Group members attending committee meetings by conference call. – The RWPG approved Anne McElroy and John Burke composing a letter to send to the Texas Attorney General requesting an opinion on RWPG members attending committee meetings by conference call.

    b. Discuss and take action on videotaping committee meetings. – The RWPG determined that videotaping committee meetings is allowed, but that Region K does not currently have money in the budget for that service.

18. **Agenda items for next meeting**

    a. Location of next meeting – The location and date of the next regular meeting will be at LCRA's Dalchau Service Center in Austin on April 11, 2018 at 10:00 a.m.

    b. Committee Meetings – A Water Modeling Committee meeting will be scheduled for some time in February.

19. **New / Other Business** – None.

20. **Public Comments** – None.

21. **Adjourn** – The meeting was adjourned at approximately 2:26 pm.

Minutes
Lower Colorado Regional Water Planning Group Regular Meeting
April 11, 2018
LCRA Dalchau Service Center
3505 Montopolis Drive
Austin, Texas
10:00 a.m.

Members Signing In:

John Burke, Water Utilities
Jim Brasher, GMA 15
Robin Gary, GMA 10
Ron Fieseler, GMA 9
Lauri Gillam, Municipalities
Karen Haschke, Public
Jason Ludwig, Electric Generating Utilities
Barbara Johnson, Industries
Donna Klaeger, Counties
Teresa Lutes, Municipalities
Ann McElroy, Environmental
Doug Powell, Recreation
Mike Reagor, Municipalities
Billy Roeder, Agriculture
Robert Ruggiero, Small Business
Mitchell Sodek, GMA 8, Alternate
Paul Sliva, Agriculture
James Sultemeier, Counties
Paul Tybor, GMA 7
David Van Dresar, Water Districts
Jennifer Walker, Environmental
David Wheelock, River Authorities
Russ Robertson, Non-Voting TDA
David Bradsby, Non-Voting, TPWD
Lann Bookout, Non-voting, TWDB

Voting Members Absent:

Daniel Berglund, Small Business
John Dupnik, GMA 10
Jim Totten, GMA 12
Byron Theodosis, Counties
GMA 8 Member, Alternate Attended

Consultants/Support/Visitors/Other:

Jeff Fox, COA, Municipalities, Alternate
Jordan Furnans, LRE Water LLC
Alicia Smiley, AECOM
Cindy Smiley, Smiley Law Firm
David Lindsay, Recreation, Alternate
Karen Bondy, River Authorities, Alternate
Christianne Castleberry, Water Utility Alt.
Vicky Kennedy, Travis County
Elizabeth McCoy, TWDB
Helen Gerlach, COA-Austin Water
Linda Raschke, Counties, Alternate
Blake Neffendorf, City of Buda
Charlie Flatten, Environmental, Alternate
Andy Hines
Rebecca Batchelder, LCRA

Quorum:

Quorum: Yes
Number of voting members or alternates representing voting members present: 22
Number required for quorum per current voting membership of 25: 13

Formal Actions Taken:

1. Three voting member representative's terms were approved for renewal: Lauri Gillam, David Wheelock, and Mike Reagor. The terms were renewed for five years (from 2018 to 2023).
2. Meeting minutes from the January 10, 2018 regular meeting approved as amended.
3. LCRA was approved to execute a TWDB contract amendment to add funding to the RWPG budget.
4. Minutes from the December 7, 2018 Population and Water Demand Committee meeting were approved as amended.
5. RWPG approved inclusion of Arbuckle Reservoir (currently under construction) in the Region K Cutoff Model as an existing supply.
6. Regional Water Planning Group approved a process for identifying potentially feasible water management strategies for this cycle, as outlined in the meeting.

Regular Meeting:

1. **Call to Order** – Chairman John Burke called the meeting to order at about 10:02 am.
2. **Welcome and Introductions** – Chairman John Burke welcomed all to the meeting.
3. **Receive public comments on specific issues related to agenda items #8-20** – None.
4. **Attendance Report** – Attendance report information was included in the members' packets for review.
5. **Discuss and take action on renewal of voting member representative's terms** – Chairman Burke led the discussion explaining that voting members Lauri Gillam, David Wheelock, and Mike Reagor have expiring terms and each would like to renew their term. Teresa Lutes motioned to approve renewal of the voting members' terms. The terms will be renewed for five years (from 2018 to 2023). The motion was seconded and approved by the group.
6. **Consent Agenda:**
    a. Approval of Minutes from the January 10, 2018 regular meeting – Barbara Johnson noted several minor edits to make to the minutes. A motion to approve minutes from the regular January 10, 2018 meeting as amended was approved.
    b. Financial/Budget Report – David Wheelock reported the Consultant budget is now authorized for $418,201, with $133,446 having been spent and a remaining balance of $284,755. David also reported that the grant account balance is currently $49,716 and the Members account has a balance of $3,123.
7. **Texas Water Development Board (TWDB)**
    a. TWDB Comments – TWDB Director Brooke Paup provided comments to the Regional Water Planning Group (RWPG) representing the Texas Water Development Board.
    b. Update on regional water planning activities and schedules – Lann Bookout said that the new rule changes (i.e. new rules on open meetings, public

information, and simplified planning) for Regional Water Planning are effective today. Funding has become available to TWDB to allocate to the Region K contract, so more funding is planned to be added to the existing contract with no other changes. TWDB has reviewed and approved Region K's hydrologic variance request. A required Technical Memorandum is due to TWDB in September 2018.

8. **Discuss Open Meetings Issues and Committee Meetings** – As previously discussed, on Region K's behalf, Chairman Burke sent a letter to the Attorney General asking for an opinion on some specifics on how to best address questions that had arisen about the Open Meetings Act in the context of regional water planning group and committee meetings. The Attorney General responded and directed Region K to submit a request for an opinion through a governmental body, for example, LCRA, as the planning group's administrative body. After additional discussion, the RWPG decided not to further pursue seeking an AG option at this time and to continue not allowing participation in planning group and committee meeting via conference call based on information provided by TWDB.
9. **Discuss and Take Action on Committee Assignments** – Chairman Burke led the RWPG in a discussion of Committee roles and membership. The committee list updated in the meeting is as follows:

Executive Committee John Burke – Chairman David Wheelock – Vice Chair Teresa Lutes – Secretary David Van Dresar – At Large Mike Reagor – At Large Paul Sliva – At Large	Nominating Committee Ann McElroy – Chair Jennifer Walker Karen Haschke Jim Brasher Barbara Johnson
Legislation & Policy Committee Barbara Johnson-Chair Donna Klaeger Jim Brasher Teresa Lutes John Burke David Van Dresar Jennifer Walker David Wheelock Lauri Gillam	Drought Committee David Wheelock – Chair Barbara Johnson Donna Klaeger Lauri Gillam Teresa Lutes Mike Reagor Jennifer Walker Karen Haschke Doug Powell David Van Dresar

Water Management Strategies	Water Modeling Committee
Lauri Gillam - Chair	Teresa Lutes-Chair
Donna Klaeger	Mike Reagor
John Burke	Jim Brasher
Teresa Lutes	David Wheelock
David Van Dresar	John Burke
Doug Powell	Jason Ludwig
Barbara Johnson	Ron Fieseler
Jennifer Walker	Jennifer Walker
Karen Haschke	Ann McElroy
David Wheelock	Doug Powell / David Lindsay
Ann McElroy	NV - David Bradsby
Mike Reagor	NV - Lann Bookout
NV- David Bradsby	
NV - Lann Bookout	
Population and Water Demand Committee	**Public Involvement and Participation Committee**
Lauri Gillam -Chair	Karen Haschke - Chair
Donna Klaeger	Teresa Lutes
Barbara Johnson	NV - Lann Bookout
Teresa Lutes	**By-Laws Committee**
John Burke	Donna Klaeger - Chair
David Van Dresar	Doug Powell
Jennifer Walker	Barbara Johnson
David Wheelock	Robert Ruggiero
NV - Lann Bookout	Teresa Lutes
	Paul Tybor

10. **Discuss and take action on whether or not to request LCRA or TWDB to request on Region K's behalf a written request from the Attorney General's Office regarding the issue of committee or subcommittee meetings of the RPG being attended by conferences call** – Chairman Burke stated that the RWPG had covered this in the discussion for agenda item #8; there was no action taken for LCRA or TWDB to submit a request to the Attorney General.

11. **Discussion item on process for determination of a new drought of record** – Jaime Burke from AECOM presented information on how the regional water planning process addresses a possible new drought of record. It is expected that modeling preformed for Region K supply availability analysis will show that the approximately 2008-2016 drought was worse than the prior drought of record from the 1950's and become the new critical period for water availability determination. Jaime

recommended that interested parties read Chapter 7 from the 2016 Lower Colorado RWPG Water Plan for more related information.

12. **Discuss and take action on approval by the RWPG for the political subdivision (LCRA) to execute a TWDB contract amendment** – Motion was made for LCRA to be approved to execute a TWDB contract amendment to add money to the RWPG budget. Motion was seconded and approved by the planning group.
13. **Consultant Status Report** – Jaime Burke from AECOM presented the consultant status report. Since the last meeting, AECOM has been finishing up the Population and Water Demand items and has been making updates to the appropriate chapters to reflect the new projections. AECOM has also begun work on gathering existing water supply and potential water management strategies information by sending surveys to Water User Groups (WUGs). AECOM also assisted with Water Modeling and Water Management Strategies Committee meetings since the last RWPG meeting. AECOM coordinated with TWDB regarding Region K's hydrologic variance request and will begin water availability modeling. Other upcoming work includes updating existing water supply availability amounts, beginning TWDB database entry of Region K numbers, determination of water needs, identification of potentially feasible water management strategies, and updating chapter texts for the report as able.
14. **Population and Water Demand Committee** – Lauri Gillam stated that the population and water demand projection process is nearly complete.
    a. Approval by Population and Water Demand Committee of Committee meeting minutes from December 7, 2017 – Teresa Lutes requested minor edits to the minutes from the December 7, 2017 Committee meeting. A motion to approve the minutes as amended was seconded and approved.
15. **Water Modeling Committee** –
    a. Summary of Committee meetings held January 10, and April 5, 2018 – Teresa Lutes provided a brief summary of the two Water Modeling Committee meetings. The January 10th meeting was held immediately before a full RWPG meeting. At that Committee meeting, the members approved minutes from the December 13, 2018 Committee meeting, viewed an informational presentation about surface water modeling and the Region K cut-off model, and voted to recommend the TWDB hydrologic variance request to the full RWPG for consideration for approval.

       At the April 5, 2018 Committee meeting, the group approved the January 10, 2018 meeting minutes, got an update on the status of the hydrologic variance request submitted to TWDB, discussed the Region K cut-off model, and reviewed an update on groundwater availability.

    b. Request RWPG take action to approve recommendation from Water Modeling Committee to include the Arbuckle Reservoir in the Region K Cutoff Model as an existing supply – A motion to include LCRA's Arbuckle Reservoir in the Region K Cutoff Model as an existing supply was seconded and approved. The Arbuckle Reservoir (formerly referred to as the Lane City Reservoir project) is a new off-channel reservoir project nearing completion in Wharton County

16. **Water Management Strategies Committee –**

    a. Summary of Committee meeting held April 5, 2018 – Lauri Gillam presented a summary of the April 5, 2018 Water Management Strategies Committee meeting. At the meeting, members reviewed the purpose and role of the Committee, received some background information on water management strategies in regional planning, reviewed outreach to WUGs for data, reviewed the last cycle's process and recommended for approval at today's meeting, and reviewed public comments from the last planning cycle.

17. **Present Region K process for identifying potentially feasible water management strategies for comment by planning group** – Jaime Burke from AECOM presented the process used in the last planning cycle for identifying potentially feasible water management strategies. The RWPG discussed the process and possible adjustments that could be made for this planning cycle.

18. **Take public comments on the Region K process for identifying potentially feasible water management strategies** – Jordan Furnans from LRE Water made a comment that the Region K group should take land subsidence into account when considering groundwater water management strategies related to groundwater pumping, as he recently provided TWDB with a report on the relationship of groundwater pumping and subsidence.

    Written comment provided by Jordan Furnans: To inform group of TWDB Subsidence Study Results and Availably of report/information.

19. **RWPG to consider planning group and public comments to revise process for identifying potentially feasible water management strategies, as needed, and take action to approve process** – A motion was made, seconded, and approved by the RWPG to approve the process discussed for identifying potentially feasible water management strategies for this cycle.

20. **Other Committee Reports as needed** – None

21. **Agenda items for next meeting**

    a. Location of next meeting – The location and date of the next regular meeting will be at LCRA's Dalchau Service Center in Austin on July 11, 2018 at 10:00 a.m. Further regular RWPG meetings will be held August 29, 2018 and October 10, 2018.

    b. Committee Meetings – A Water Modeling Committee meeting will be scheduled for some time in late June, before the next RWPG meeting.

22. **New / Other Business** – None.

23. **Public Comments** – None.

24. **Adjourn** – The meeting was adjourned at approximately 12:18 pm.

Minutes
Lower Colorado Regional Water Planning Group Regular Meeting
July 11, 2018
LCRA Dalchau Service Center
3505 Montopolis Drive
Austin, Texas
10:00 a.m.

Members Signing In:

John Burke, Water Utilities
Jim Brasher, GMA 15
Robin Gary, GMA 10, Alternate
Ron Fieseler, GMA 9
Karen Haschke, Public
Jason Ludwig, Electric Generating Utilities
Barbara Johnson, Industries
Donna Klaeger, Counties
Ann McElroy, Environmental
Doug Powell, Recreation
Mike Reagor, Municipalities
Helen Gerlach, Municipalities, Alternate
Paul Babb, GMA 8, Alternate
Paul Sliva, Agriculture
James Sultemeier, Counties
Paul Tybor, GMA 7
Jim Totten, GMA 12
Byron Theodosis, Counties
David Van Dresar, Water Districts
David Wheelock, River Authorities
David Bradsby, Non-Voting, TPWD
Lann Bookout, Non-voting, TWDB

Voting Members Absent:

Daniel Berglund, Small Business
Jennifer Walker, Environmental
Teresa Lutes, Munic., Alternate Attended
Robert Ruggiero, Small Business
Lauri Gillam, Municipalities
Mitchell Sodek, GMA 8, Alternate Attended
David Caldwell, GMA 10, Alternate Attended

Consultants/Support/Visitors/Other:

Jordan Furnans, LRE Water LLC
Alicia Smiley, AECOM
Cindy Smiley, Smiley Law Firm
David Lindsay, Recreation, Alternate
Christianne Castleberry, Water Utility Alt.
Paul King, Rancher
Joe Trungale, Consultant
Richard Hoffpauir, Hoffpauir Consulting PLLC
Diane Wheeler, Alternate
Blake Neffendorf, City of Buda
Prachi Patel, Austin Water
James Kowis, Consultant
Troy Wenzel, TCESD #8
Charles Olfers, County Comm. Gillespie Co
Kylie Beard, LCRA
Danielle Noor, Sunset Commission
Mikayla Garrison, Sunset Commission
Erick Fajardo, Sunset Commission
Rusty Ray, TSSWCB
James Babb
Christiane Alepuz, CAPCOG
Jaime Burke, AECOM

Quorum:

Quorum: Yes
Number of voting members or alternates representing voting members present: 22
Number required for quorum per current voting membership of 25: 13

Formal Actions Taken:

1. Minutes from April 11, 2018 regular meeting were approved, as amended.
2. Charles Olfers, Gillespie County, elected as voting member for Agricultural Interest category.
3. Initial surface water availability modeling results, as presented, were approved for inclusion in the Technical Memo to be submitted to TWDB in September 2018.
4. LCRA, Austin, and West Travis County Public Utilities Agency approved to be submitted as major water providers in Region K.

Regular Meeting:

1. **Call to Order** – Chairman John Burke called the meeting to order at about 10:29 am.
2. **Welcome and Introductions** – Chairman John Burke welcomed all to the meeting.
3. **Receive public comments on specific issues related to agenda items #5-13** – Troy Wenzel, Assistant Fire Chief at Pedernales Fire Department, Travis County, communicated his concern that their fire department relies on water from the Highland Lakes and that the lakes levels are falling. Low levels in the lakes mean their pumps cannot access water to fight fires. He would like the Region K group to take this into consideration in their decisions throughout the process.
4. **Attendance Report** – Attendance report information was included in the members' packets for review.
5. **Discuss and take action as necessary to fill voting member vacancy for Agricultural Interest category** – Chairman Burke led the discussion. Both Paul King and Charles Olfers were under consideration to fill the voting member vacancy for the Agricultural Interest category. The Executive Committee recommended Charles Olfers for approval. Discussion included concerns about being able to equally represent all the counties in Region K if Paul King was chosen as the voting member. Paul Tybor motioned to approve Charles Olfers as the voting member to fill the vacancy for Agricultural Interest category. The motion was seconded by James Sultemeier and approved by the group.
6. **Consent Agenda:**
    a. Approval of Minutes from the April 11, 2018 regular meeting – Barbara Johnson noted several edits to make to the minutes. Robin Gary noted an edit on the location and date of the next meeting. A motion was made and approved to adopt the minutes from the regular April 11, 2018 meeting as amended.
    b. Financial/Budget Report – David Wheelock reported the total consultant budget was being revised to $723,046 for the study period. So far the consultant has spent $197,468 and there is remaining balance of $ 525,577. Account balance for paying the consultant, which is reimbursed by the TWDB, is $44,747. The members account has a balance of $ 3,004.
7. **Texas Water Development Board (TWDB)**
    a. Update on regional water planning activities and schedules – Lann Bookout reminded the group that TWDB continues to hold financial assistance workshops. These are posted on their webpage on the financial assistance tab. It was noted that we are about halfway through the planning cycle. Technical memos are due to TWDB in September.
8. **Committee Reports**
    a. **Water Modeling Committee** – Mike Reagor explained that the water availability model being run by the consultant uses new evaporation rates provided by TCEQ.

Additionally, the model uses a multi-use pattern for downstream water demands, as in the last planning cycle.

Later in the meeting there is going to be a presentation on the surface water availability modeling results recommended by the Water Modeling Committee to include in a Technical Memo due to TWDB in September. At5 its July 11th committee meeting, the Water Modeling Committee voted to recommend the modeling results to the group for the full groups' consideration for approval for this Technical Memo.

Jaime Burke, from AECOM, provided additional information on the Water Modeling Committee meeting that was held on June 27th. In this committee meeting, the initial modeling results were reviewed, there was discussion of the different options for determining the new drought of record period (e.g. full-to-full, full-to-empty, etc.), and consultants were asked to perform additional analysis on using a multi-use demand pattern for certain downstream water rights rather than an industrial use pattern.

9. **Consultant Status Report** – Jaime Burke, from AECOM, presented overall consultant progress in the planning process. Progress has been made on the chapter one text, water supplies and water availability numbers, water needs determination, identification of feasible water management strategies, and assessment of the new drought of record period. Ann McElroy requested more detail on various aspects of the progress report. Jaime Burke acknowledged this request.

   Jaime provided information on water management strategy survey results and next steps for identifying feasible water management strategies. For the upcoming technical memo, the consultant will update water supply numbers, finish database entry, complete the draft technical memo, post the technical memo for public comment, and design the scope of work for evaluating water management strategies. Ann McElroy asked for clarification on the posting and due dates for the technical memo; Jaime Burke clarified that the meeting to approve the technical memo would be August 29th, the technical memo would be posted on August 22nd, and the regular meeting notice would be posted on August 15th. After the regular meeting on August 29th, the public will have 14 days to make comments, all of which need to be submitted to TWDB. The technical memo is due to TWDB on September 10th.

10. **Discuss and take action on initial surface water modeling results** – Joe Trungale, from Trungale Engineering & Science, presented initial surface water availability modeling results. Since the last regular meeting, two changes were made to the model: the evaporation and precipitation inputs were updated to the most recent dataset and a multi-use pattern was used for all downstream irrigation demands except for Garwood (where an irrigation water use pattern was used). The multi-use pattern was used for all downstream irrigation demands except for Garwood during the last planning cycle.

    Modeling assumptions that are the same as presented at the last regular meeting but differ from the last planning cycle are: hydrology was updated through 2016, the Arbuckle off-channel reservoir has been added to the model, sedimentation rates have been updated, the Gulf Coast water right was split into two, routine water rights updates from TCEQ's WAM were made, a new City of Austin monthly demand pattern was used, and there was an update to the balancing of Lakes Travis and Buchanan in the model. The modeling results show that the new critical period for drought in the basin is October 2007-December 2016.

    Jaime Burke requested that the group consider approval of the initial surface water availability numbers for use in the technical memo, which will be used in TWDB's database. Ms. Burke reiterated that the group would only be approving initial numbers and that there will be opportunities for discussion and changes of the numbers. if necessary. Ron Fieseler motioned to approve the presented initial surface water availability numbers for use in the technical

memo, which will be used in TWDB's database, Paul Tybor seconded, and the group approved the motion.

11. **Discussion of water supply/ potentially feasible strategies survey responses** – Jaime Burke, from AECOM, explained that information on identified potentially feasible strategies is to be included as part of the technical memo to be submitted to TWDB in September. The Region K Potentially Feasible Strategies Survey was sent out to municipal Water User Groups (WUGs) to gather information for this purpose, including requesting feedback on existing water supplies and potentially feasible strategies. For WUGs included in the last plan, the survey included information on supplies and strategies from the 2016 plan was included as a starting point. The survey also included space to provide planned strategies that the WUGs would like to include in the 2021 plan. There was a 65% response rate. Of the unresponsive WUGs, there were 13 new WUGs. For most of the unresponsive WUGs, the consultant can work to find information on strategy options, and for the others additional outreach will be undertaken.

    Several WUGs share sources with entities in other regional planning groups and need to coordinate regionally. Donna Klaeger asked if there was a deadline to respond to the survey; Jaime Burke responded that there is no official deadline, but it would be helpful to know all strategies to be evaluated by the end of the year to inform the scope of work. Next steps include listing the strategies in the technical memo and working with the Water Management Strategies Committee to add strategies, as needed. Robin Gary requested the survey results be presented in map form; Jaime Burke agreed.

12. **Discuss and take action on Region K Major Water Providers** – Jaime Burke, from AECOM, explained that a major water provider in this planning cycle is defined as a WUG or wholesale water provider that is of significance to the region's water supply as determined by the water planning group. A list of Region K major water providers should be submitted at the same time as the technical memo. The group discussed which entities would be considered as major water providers for Region K. David Van Dresar made a motion to approve LCRA, Austin, and West Travis County Public Utilities Agency as the major water providers for Region K. The motion was seconded by Ron Fieseler and approved by the group.

13. **Discuss Technical Memorandum** –

    a. **Data to be included** – Jaime Burke, from AECOM, explained that the following items need to be included in the technical memorandum: reports generated by TWDB related to population, demand projections, source water availability, existing water supplies, identified needs and surpluses, water balances for the sources, and comparison of these data to the 2016 water plan. The consultant team will add supply and water availability data into the TWDB database, TWDB has already entered population and demand information, and information for inclusion in the reports is generated based on the supply and demand data. The consultant will need to include documentation of the process for identifying water management strategies by using a template provided by TWDB. Information regarding the surface water availability models (WAMs) and groundwater availability models (GAMs) used in the process will also be included.

    b. **Posting /comment period for technical memo** – Submittal of the technical memo will need to be considered for approval at a regular planning group meeting. The agenda for the regular planning group meeting will need to be posted 14 days before the day of the meeting and it is recommended that the technical memo be available for review one week prior to meeting date. Public comments are accepted for 14 days following the meeting. The technical memo is due on September 10th. Public comments received after September 10th but within the 14 days following the meeting are to be submitted separately. August 29th is the scheduled meeting date for planning group consideration of the technical memo approval.

c. **Other items** – None.

14. **Agenda items for next meeting –**

a. David Wheelock to present information on sedimentation rates

b. Richard Hoffpauir to make presentation on climate change modeling in the City of Austin's Water Forward integrated water resource plan effort as he did in a recent Water Modeling Committee meeting.

c. Donna Klaeger, Bylaws Committee Chair, to convene a Bylaws Committee meeting on August 29th prior to the regular group meeting.

15. **New/ Other Business** – None

16. **Public Comments** – None.

17. **Adjourn** – The meeting was adjourned at approximately 11:57 am.

Meeting Minutes
Lower Colorado Regional Water Planning Group Regular Meeting
August 29, 2018
LCRA Dalchau Service Center
3505 Montopolis Drive
Austin, Texas
10:00 a.m.

Members Signing In:

John Burke, Water Utilities
Jim Brasher, GMA 15
Scott Edmonson, Municipalities Alternate
Robin Gary, GMA 10, Alternate
Lauri Gillam, Municipalities
Karen Haschke, Public
Jason Ludwig, Electric Generating Utilities
Teresa Lutes, Municipalities
Barbara Johnson, Industries
Charles Olfers, Agriculture
Robert Ruggiero, Small Business
James Sultemeier, Counties
Jim Totten, GMA 12
Byron Theodosis, Counties
David Wheelock, River Authorities
Jennifer Walker, Environmental
David Bradsby, Non-Voting, TPWD
Lann Bookout, Non-voting, TWDB
Doug Powell, Recreation

Voting Members Absent:

Daniel Berglund, Small Business
Paul Tybor, GMA 7
Mike Reagor, Municipalities, Alternate Attended
Paul Sliva, Agriculture
Ron Fiesler, GMA 9
Donna Klaeger, Counties
Ann McElroy, Environmental
Mitchell Sodek, GMA 8
David Caldwell, GMA 10, Alternate Attended
David Van Dresar, Water Districts

Consultants/Support/Visitors/Other:

Jordan Furnans, LRE Water LLC
Alicia Smiley, AECOM
Cindy Smiley, Smiley Law Firm
Christianne Castleberry, Water Utility Alt.
Richard Hoffpauir, Hoffpauir Consulting PLLC
Sarah Hoes, Austin Water
Rebecca Batchelder, LCRA
David Villarrial, TDA
James Kowis, Consultant
Christiane Alepuz, CAPCOG
Jaime Burke, AECOM
Laurence Brown, Jr., TSSWCB
David Lindsay, Recreation Alternate

Quorum:

Quorum: Yes
Number of voting members or alternates representing voting members present: 17
Number required for quorum per current voting membership of 25: 13

Formal Actions Taken:

1. Minutes from July 11, 2018 regular meeting were approved as presented.
2. The group approved a motion that Region K will not pursue a simplified planning option this planning cycle.
3. The group approved a motion to:
    - Approve the Region K Technical Memorandum with the three edits noted by the planning group to be made by the Technical Consultant, and
    - Authorize submittal of the Region K Technical Memorandum to the TWDB by September 10, 2018.
4. The group approved a motion to authorize the Technical Consultant to submit public comments by September 12, 2018 to TWDB.
5. The group approved motions to:
    - Approve the Task 5A Partial Scope of work with edit as discussed,
    - Authorize LCRA to submit a request to the TWDB for a Notice-to-Proceed with partial Scope of Work for Task 5A and execute the subsequent contract amendments, and
    - Authorize the Technical Consultant to make minor edits to the partial Scope of Work based on comments received from TWDB.

Regular Meeting:

1. **Call to Order** – Chairman John Burke called the meeting to order at 10:02 a.m.
2. **Welcome and Introductions** – Chairman John Burke welcomed all to the meeting.
3. **Receive public comments on specific issues related to agenda items #7-16** – None.
4. **Attendance Report** – Attendance report information was included in the members' packets for review.
5. **Consent Agenda:**
    a. Approval of Minutes from the July 11, 2018 regular meeting – Motion to approve the minutes from the regular July 11, 2018 meeting as presented was approved.
    b. Financial/Budget Report – David Wheelock reported the total consultant budget was being revised to $723,046 for the study period. So far, $238,971 has been spent on consulting services and there is remaining balance of $ 484,075. The account balance for paying the consultant, which is reimbursed by the TWDB, is $44,815. The members account has a balance of $ 3,009.
6. **Texas Water Development Board (TWDB)**
    a. Update on regional water planning activities and schedules – Lann Bookout reminded the group that TWDB continues to hold financial assistance workshops. These are posted on their webpage under the financial assistance tab. Mr. Bookout noted that the planning cycle is about halfway through, and that the group is on track. Technical memos are due to TWDB in September. The Water for Texas conference will be held in January.

7. **Committee Reports**

   a. **Bylaws Committee** – None.

   b. **Other committee reports, as needed** – None.

8. **Consultant Status Report** – Jaime Burke, AECOM, made a presentation on the overall consultant progress on the planning process. Recent efforts have focused on water availability and supply, water needs, work on the technical memorandum, drought response, and work on preparation of a draft partial scope of work for Task 5A (evaluation of water management strategies for Regional Water Planning Group consideration).

9. **Consultant presentation of draft Region K Technical Memorandum – AECOM**

   a. Discussion of draft Region K Technical Memorandum – Jaime Burke, AECOM, explained that the Technical Memorandum is the first deliverable due to TWDB for this planning cycle. Jaime explained what needs to be included in the Technical Memorandum and went over methodologies for groundwater and surface water. Ms. Burke highlighted that the process for identifying potentially feasible water management strategies is documented in the draft Technical Memorandum. After discussion of the draft Technical Memorandum, three relatively minor-scale edits were noted from the planning group discussion.

   b. Discussion of simplified planning option with respect to Region K. Take action as needed. – Information was presented regarding a simplified planning approach option that planning groups can take if there are no significant changes to a number of key water planning parameters within a region. It was discussed that in Region K there have been some significant changes since last planning cycle on a number of the key parameters. Jennifer Walker motioned that Region K not pursue simplified planning this cycle. David Wheelock seconded. The planning group unanimously voted to approve this motion. Thus far, no regions have chosen the simplified planning process.

10. **Receive oral and written public comments on the draft Technical Memorandum (Public comments limited to 3 minutes per speaker). Written comments may be submitted through September 12, 2018, to Mr. John Burke, Region K Chairman, by mail: c/o LCRA (Administrative Agent), P.O. Box 220, Austin TX 78767; or by email administrative@regionk.org** – No public comments were provided at the meeting.

11. **Take action regarding the draft Region K Technical Memorandum**

    a. Consider approval to authorize the Technical Consultant to address the Planning Group changes to the draft Region K Technical Memorandum.

    b. Consider approval to authorize the Technical Consultant to submit the Region K Technical Memorandum to TWDB by September 10, 2018.

       Teresa Lutes made a motion to: a) approve the Region K Technical Memorandum with the three edits noted by the planning group to be made by the Technical Consultant, and b) authorize submittal of the Region K Technical Memorandum to the TWDB by September 10, 2018. Karen Haschke seconded this motion and the planning group approved.

    c. Consider approval to authorize the Technical Consultant to submit public comments that are received by September 12, 2018, to TWDB.

       James Sultemeier made a motion to authorize the Technical Consultant to submit public comments by September 12, 2018 to TWDB. David Wheelock seconded the

motion and the planning group approved the motion.

12. **Discuss and consider draft Task 5A Partial Scope of Work for evaluation water management strategies** – Jaime Burke, AECOM, presented a brief summary on the Water Management Strategies Evaluation task. Ms. Burke presented a partial scope of work for four strategies: drought management, basic and advanced water conservation strategies, expand use of local groundwater, and City of Austin return flows. The Regional Water Planning Group discussed the various strategies and suggested edits to the wording of the scope of work. Jennifer Walker asked about the current timeline and schedule. Jamie Burke noted that it can take up to 60 days for TWDB to approve the scope of work but will probably be complete in early 2019. David Wheelock requested a minor text change regarding peak modeled available groundwater factors. David Wheelock also suggested that it would be good for the Water Management Strategies Committee to plan to meet soon. Jennifer Walker asked about the process for other strategies to be evaluated with the budget remaining after the tasks in the draft Scope of work are complete. Jamie noted that there were about 40 strategies in the last plan survey so there will likely be quite a number of additional strategies to add to the scope of work for water management strategy evaluation.

13. **Receive public comments on draft Task 5A Partial Scope of Work for evaluation of water management strategies** – None.

14. **Consider and take action on approval of the Task 5A Partial Scope of work and authorize LCRA to submit a request to the TWDB for a Notice-to-Proceed with partial Scope of Work for Task 5A and execute the subsequent contract amendments. Consider and take action on authorizing Technical Consultant to make minor edits to the partial Scope of Work based on comments received from TWDB. –**

    After discussion (see item #12, above), the planning group approved the following motions:

    - Approve the Task 5A Partial Scope of work with edit as discussed,
    - Authorize LCRA to submit a request to the TWDB for a Notice-to-Proceed with partial Scope of Work for Task 5A and execute the subsequent contract amendments,
    - Authorize the Technical Consultant to make minor edits to the partial Scope of Work based on comments received from TWDB.

15. **Presentation on hydrographic survey of lakes Travis and Buchanan and resulting sedimentation estimates** – David Wheelock, LCRA, gave a brief introduction on the hydrographic survey of lakes Travis and Buchanan. Nathan Leber, TWDB, gave a presentation on the process, data, and deliverables associated with the hydrographic surveys and sedimentation estimates. David Wheelock then discussed the various factors that may affect sedimentation at the lakes.

    Jordan Furnans provided comments on the apparent increase in volume of the lakes compared to past surveys, the time required to perform the surveys, sedimentation's effects on water availability, and suggested that TWDB should allow a competitive bidding process for conducting hydrographic surveys.

16. **Presentation on City of Austin analysis of basin-wide hydrologic conditions incorporating impacts of climate change projections and identification of drought conditions worse than the Drought of Record for planning purposes.** – Richard Hoffpauir, consulting hydrologist, provided a presentation on the City of Austin's water availability model (WAM) climate-change and drought worse than the drought of record analysis. Teresa Lutes, Austin Water, invited discussion of how climate change could be

included as part of the Region K process. Concern was expressed about maintaining consistency with TWDB approved methods and other potential uncertainties. Based on the discussion, the group may look at the possibly adding a policy recommendation about planning for climate change and droughts worse than the drought of record in the policy chapter of the plan. This possibility can be discussed in future at the Policy Committee for consideration by the Policy Committee and full group.

17. **Update and discussion on current very low inflows into the Highland Lakes to include but not limited to:**

    a. Update from LCRA – David Wheelock, LCRA, discussed that the Highland Lakes inflows from January-July 2018 are the 3rd worst on record. However, Mr. Wheelock noted that the lakes are still in relatively good shape. Mr. Wheelock added that LCRA is in the process of updating their Water Management Plan.

    b. Update on upcoming TWDB Study of watershed to better understand low inflows – Lann Bookout, TWDB, updated the group on the status of a follow-up report to the study titled "Evaluation of Rainfall/Runoff Patterns in the Colorado River Basin". That study showed that over time the rainfall-runoff relationship has decreased. A request for qualifications (RFQ) for an update to the study has been released and the new study is anticipated to be finished sometime in 2019.

    c. Discussion on potential impacts/ramifications – David Lindsay, Recreation Alternate, discussed how eight of the lowest annual inflows in period of record have been recorded in the last twelve years. Mr. Lindsay stated his concerns regarding planning using only historical data. Jim Brasher voiced his support for investigating potential factors that may be affecting stream flows, but cautioned against the risk of misinterpreting the cause of low streamflow when it occurs during droughts. Jennifer Walker added that the "Evaluation of Rainfall/Runoff Patterns in the Colorado River Basin" report did not make strong conclusions, but recommended a follow-up study.

18. **Agenda Items for next meeting**

    a. Location and date of next meeting – October 24th Regional Water Planning Group meeting. Plan is to have a Water Management Strategies Committee meeting sometime before then.

    b. Other committee meetings – None.

19. **New / Other Business (time permitting)** – None.

20. **Agenda items for next meeting** – Jaime Burke, AECOM, mentioned that possible agenda items for the next meeting may include water management strategies or upcoming chapters.

21. **Adjourn** – The meeting was adjourned at 1:14 pm.

Neil Hudgins (CBGCD GM), Ed Weinheimer (CBGCD Director), and L.G. Raun, Jr. (CBGCD Director) all sit on the Region P Water Planning Group.

The following sets of minutes show that CBGCD participated in at least 50% of Region P meetings.

Minutes of Lavaca Regional Water Planning Group
October 2, 2017
Edna, Texas

A meeting of the Lavaca Regional Water Planning Group was held in the Meeting Room of the Lavaca Navidad River Authority Office Complex, 4631 FM 3131, located approximately seven (7) miles east of Edna, Jackson County, Texas off FM 3131 on Monday, October 2, 2017 at 1:30 p.m.

Voting Group Members present were: Patrick Brzozowski, Tom Chandler, Jim Coleman, Neil Hudgins, Jack Maloney, Richard Ottis, Edward Pustka, L.G. Raun, Robert Shoemate, Gary Skalicky, Michael Skalicky, Phillip Spenrath, Chairman Harrison Stafford II, and Ed Weinheimer.

Absent Voting Group Members were: John Butschek, Marie Day, Robert Martin, and David Wagner.

Also present was: Ron Ellis of Texas Water Development Board, Jaime Burke of AECOM, Josh Harper of Texas Parks and Wildlife Department, Steve Ramos, City of Corpus Christi. Also present was Ronald Kubecka, LNRA Board President, Jerry Adelman, LNRA Board Vice President, Sandy Johs, LNRA Board member, Doug Anders, LNRA Deputy General Manager, Operations, and Karen Gregory, LNRA Deputy General Manager, Administration.

Chairman Stafford called the meeting to order.

Public Comments

There were no public comments.

Minutes

The minutes of the February 23, 2017 meeting were reviewed. Coleman moved to approve the minutes as presented. Brzozowski seconded the motion. Motion passed.

Nominations for New Voting Members

Brzozowski informed the Group that Voting Member Marie Day was actively seeking potential members for the Lavaca County open positions.

Briefing from AECOM Consultant

Burke briefed the Group on the following:

- Update on draft population and municipal demand projections.
- Presentation of draft non-municipal demand projections.
    - Draft irrigation demand projections

- Draft manufacturing demand projections
- Draft steam-electric demand projections
- Draft mining demand projections
- Draft livestock demand projections

The Group was presented copies of the draft projections for their review.

Spenrath moved to request revising the Base GPCD numbers for the municipal WUGs be modified to reflect the 2011 historical utility-boundary GPCD, and that the municipal demands reflect this change. M. Skalicky seconded the motion. Motion passed.

Spenrath moved to request revising the irrigation demand projections in all counties to equal an average of the water use in the years 2011- 2013, rather than 2010-2014. Raun seconded the motion. Motion passed.

Brzozowski moved to request changing the manufacturing demand projections in Wharton County to include the potentially unaccounted-for additional manufacturing use data provided by TWDB, and in Jackson County to include a recently increased LNRA customer demand. Ottis seconded the motion. Motion passed.

TWDB inadvertently listed a Region K steam-electric facility as part of the Region P demand. Brzozowski moved to request TWDB move the demand to Region K. Spenrath seconded the motion. Motion passed.

Spenrath moved to request revising the livestock demand projections in all counties to reflect a water use rate of 30 GPCD for fed/other cattle, rather than 15 GPCD. M. Skalicky seconded the motion. Motion passed.

Burke will prepare a letter with supporting documentation to TWDB to communicate the comments and revision requests from the LRWPG discussed and voted on today.

Briefing and Update from Texas Water Development Board

Ellis briefed the Group on legislative updates including:

- Upcoming rule revisions to the regional planning rules (31 Texas Administrative Code Chapter 357)
- SWIFT Projects Update
- Simplified Planning

Future Meeting Dates

The Group's next regular meeting was tentatively scheduled for January 18, 2018 at 1:30 p.m.

Public Comments

There were no public comments.

The meeting adjourned at 3:40 p.m.

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Harrison Stafford II
Chairman

Minutes of Lavaca Regional Water Planning Group
February 23, 2017
Edna, Texas

A meeting of the Lavaca Regional Water Planning Group was held in the Meeting Room of the Lavaca Navidad River Authority Office Complex, 4631 FM 3131, located approximately seven (7) miles east of Edna, Jackson County, Texas off FM 3131 on Thursday, February 23, 2017 at noon.

Voting Group Members present were: Patrick Brzozowski, John Butschek, Tom Chandler, Jim Coleman, Marie Day, Neil Hudgins, Jack Maloney, Robert Martin, Richard Ottis, L.G. Raun, Robert Shoemate, Phillip Spenrath, Michael Skalicky, Chairman Harrison Stafford II, and Ed Weinheimer.

Absent Voting Group Members were: Robert Martin, Edward Pustka, and David Wagner.

Also present was: Ron Ellis and Scott Galaway of Texas Water Development Board, Jaime Burke of AECOM, Josh Harper of Texas Parks and Wildlife Department, and Gary Skalicky, Jackson County citizen. Also present was Stephen Cortes of Kip Averitt and Associates, Ronald Kubecka, LNRA Board President, Jerry Adelman, LNRA Board Vice President, Sandy Johs, LNRA Board member, Doug Anders, LNRA Deputy General Manager, Operations, and Karen Gregory, LNRA Deputy General Manager, Administration.

Chairman Stafford called the meeting to order.

Public Comments

There were no public comments.

Minutes

The minutes of the December 12, 2016 meeting were reviewed.

Skalicky moved to approve the minutes as presented. Weinheimer seconded the motion. Motion passed.

Nominations for New Voting Members

Brzozowski informed the Group that a Notice of Solicitation for Nominations for Persons to Serve on the LRWPG for the three open positions had been published in the area newspapers, with no response.

Michael Skalicky moved to nominate Gary Skalicky to fill the Jackson County, Agriculture position. Brzozowski seconded the motion. Motion passed.

Day informed the Group that she was actively seeking potential members for the Lavaca County open positions.

Election of Officers

Maloney moved to re-elect Stafford, Chairman, Raun, Vice-Chairman, and Brzozowski, Secretary of the Lavaca Regional Water Planning Group and Jim Coleman, Jack Maloney, Phillip Spenrath, and Ed Weinheimer to the Executive Committee. Shoemate seconded the motion. Motion passed.

Briefing from AECOM Consultant

Burke briefed the Group on the following:

- Notice to Apply for Grant Funds was posted on February 1, 2017.
- Grant application for funding was submitted to TWDB on February 6, 2017.
- Scope and Schedule for 5th Planning Cycle.
- Draft Population and Municipal Demand Projections.
- Draft Mining Demand Projections

Briefing and Update from Texas Water Development Board

Galaway updated the Group on the SWIFT funding. Applications were due February 3rd and 22 applications were received totaling approximately 1.9 billion from across the state of Texas.

Ellis briefed the Group on the modeled available groundwater (MAG) peak factor. The Group was presented information regarding the MAG peak factor produced by the Texas Water Development Board.

Ellis also presented the Group via powerpoint a Water Planning introduction, indicating information on the water planning process.

Briefing on Goldwater Project

Stephen Cortes from Kip Averitt and Associates presented the Group with information regarding the Goldwater Project.

Averitt and Associates have been contracted by the Texas Water Development Board (TWDB) to quantify and measure water conservation strategies being implemented in all 16 regions under the 2017 State Water Plan. The TWDB wants to know how much progress is being made toward reaching the conservation goals laid out in the state water plan.

One of the goals of the Goldwater Project is to ensure a uniform methodology for measuring conservation in all regions that also accounts for unique situations among utilities. Ultimately, planners will have a reliable numerical value for the conservation work being done. Cortes stated that reports should be available for the Group by August 2017.

Future Meeting Dates

The Group's next regular meeting will be scheduled for mid July.

Public Comments

There were no public comments.

The meeting adjourned at 2:45 p.m.

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Harrison Stafford II
Chairman

Minutes of Lavaca Regional Water Planning Group
August 6, 2018
Edna, Texas

A meeting of the Lavaca Regional Water Planning Group was held in the Meeting Room of the Lavaca Navidad River Authority Office Complex, 4631 FM 3131, located approximately seven (7) miles east of Edna, Jackson County, Texas off FM 3131 on Monday, August 6, 2018 at noon.

Voting Group Members present were: Patrick Brzozowski, Tom Chandler, Steve Cooper, Neil Hudgins, Jack Maloney, Robert Shoemate, Dennis Simons, Gary Skalicky, Michael Skalicky, Phillip Spenrath and Ed Weinheimer.

Absent Voting Group Members were: John Butschek, Jim Coleman, Marie Day, Robert Martin, Bart McBeth, Richard Ottis, Edward Pustka, and David Wagner.

Also present was: Elizabeth McCoy of Texas Water Development Board, Jaime Burke of AECOM, Caren Collins of Texas Parks and Wildlife Department, and Tony Franklin of Texas State Soil and Water Conservation Board. Also present was Ronald Kubecka, LNRA Board President, Jerry Adelman, LNRA Board Vice President, and Karen Gregory, LNRA Deputy General Manager, Administration.

Chairman Spenrath called the meeting to order.

It was determined that a quorum of the LRWPG was not present. Additional members were expected to arrive before any action items would need to be taken.

Public Comments

There were no public comments.

Briefing and Update from Texas Water Development Board

McCoy briefed the Group on the following:

- TWDB approval of LRWPG's request to modify surface water availability hydrologic assumptions for development of the 2021 Region P Regional Water Plan.
- State Flood Assessment is expected to be available online (texasfloodassessment.com) and open for public comments in August 2018. Final report is expected to be delivered in December 2018.
- Water for Texas 2019 Conference (January 23-25) registration is now available.

Briefing from AECOM Consultant

Burke briefed the Group on the following:

- Update on effort to date and timeline.
- Update on existing water supplies and identified water needs.
- Update on potentially feasible waer management strategies.

Nominations for New Voting Members

Brzozowski informed the Group that Robert Martin, Jackson County, Agriculture, had submitted his resignation from the LRWPG. The Group will continue to solicit new voting members for Lavaca County, Small Business and Jackson County, Agriculture.

Presentation of Technical Memorandum

Burke briefed the Group on the Technical Memorandum which is a compilaton of the task work performed to date as part of the regional water planning process to develop the 2021 Lavaca Regional Water Plan for Region P. It is prepared for the Texas Water Development Board (TWDB) as a deliverable associated with Task 4C.

The Technical Memorandum includes the TWDB DB22 Database Reports that provide data on the following areas:

- Population Projections
- Water Demand Projections for all water use categories
- Summary of demands, supplies, and needs by water use category
- Water sources and their availability volumes
- Exising water supplies for all Water User Groups
- Analysis of water needs and surpluses
- Water Source Balance (Availability-Water User Group Supply)
- Comparison of Water User Group and Water Source data between the 2016 RWP and 2021 RWP

There were no public comments.

G Skalicky and Shoemate entered the Group's meeting at 1:28 p.m. and Chairman Spenrath declared that a quorum of the Region P Group was formed.

Weinheimer moved to authorize the Technical Consultant (AECOM) to address the Region P changes to the draft Technical Memorandum and approve submittal of the Technical Memorandum to TWDB prior to September 10, 2018, including public comments received through August 20, 2018. Cooper seconded the motion. Motion passed.

Minutes

The minutes of the June 18, 2018 meeting were reviewed. Weinheimer moved to approve the minutes as presented. Brzozowski seconded the motion. Motion passed.

Potential Water Management Strategy Evaluation Scope of Work (Task 05A)

Burke briefed the Group on Task 5A Scope of Work, Water Management Strategy Evaluation Task. TWDB has allocated budget to Task 5A ($45,001). The Group is required to prepare a scope of work for each strategy evaluation to be performed. The scope of work must be preented for public input and Group approval before submitting to TWDB for their approval. The Group was presented a copy of Scoping Template for Currently Contracted Task 5A Funding for Region-Specific Subtasks for their review. Burke recommended for $2,500 of the budget to be unallocated for additional strategies.

There were no public comments.

Spenrath moved to approve the Task 5A Scope of Work as presented and authorize the technical consultant to make minor adjustments as needed, authorize LNRA to submit a request to the TWDB for a Notice-to-Proceed with the Scope of Work for Task 5A, and execute the subsequent contract amendments. Weinheimer seconded the motion. Motion passed.

Future Meeting Dates

A Region P meeting is tentatively scheduled for Monday, January 28, 2019 at noon.

Public Comments

There were no public comments.

The meeting adjourned at 1:41 p.m.

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Phillip Spenrath
Chairman

Minutes of Lavaca Regional Water Planning Group
April 16, 2018
Edna, Texas

A meeting of the Lavaca Regional Water Planning Group was held in the Meeting Room of the Lavaca Navidad River Authority Office Complex, 4631 FM 3131, located approximately seven (7) miles east of Edna, Jackson County, Texas off FM 3131 on Monday, April 16, 2018 at noon.

Voting Group Members present were: Patrick Brzozowski, Tom Chandler, Marie Day, Neil Hudgins, Jack Maloney, Richard Ottis, Edward Pustka, L.G. Raun, Gary Skalicky, Michael Skalicky, Phillip Spenrath, Chairman Harrison Stafford II, and Ed Weinheimer.

Absent Voting Group Members were: John Butschek, Jim Coleman, Robert Martin, Robert Shoemate and David Wagner.

Also present was: Ron Ellis and Elizabeth McCoy of Texas Water Development Board, Jaime Burke of AECOM, Josh Harper of Texas Parks and Wildlife Department, Mike Rivet of Formosa Plastics Corporation, Rusty Ray of Texas State Soil and Water Conservation Board, Dennis Simons, Steve Cooper, and Bart McBeth, public. Also present was Ronald Kubecka, LNRA Board President, Jerry Adelman, LNRA Board Vice President, Doug Anders, LNRA Deputy General Manager, Operations, and Karen Gregory, LNRA Deputy General Manager, Administration.

Chairman Stafford called the meeting to order.

Public Comments

There were no public comments.

Minutes

The minutes of the October 2, 2017 meeting were reviewed. M Skalicky moved to approve the minutes as presented. Weinheimer seconded the motion. Motion passed.

Accept Resignation

Brzozowski informed the Board that Chairman Stafford had submitted his resignation letter to the Lavaca Regional Water Planning Group.

Brzozowski moved to accept the resignation, with regrets, from Harrison Stafford II as Chairman and voting member of the Lavaca Regional Water Planning Group. Ottis seconded the motion. Motion passed.

Vice Chairman Raun announced his resignation from the Lavaca Regional Water Planning Group.

Brzozowski moved to accept the resignation, with regrets, from L.G. Raun as Vice Chairman and voting member of the Lavaca Regional Water Planning Group. Ottis seconded the motion. Motion passed.

Resolution Presentation to Harrison Stafford II

Brzozowski presented Stafford with a Resolution recognizing his diligence in carrying out the duties and responsibilities while serving twenty years on the Lavaca Regional Water Planning Group.

M Skalicky moved to approve the Resolution as presented. Maloney seconded the motion. Motion passed.

Nominations for New Voting Members

Raun introduced Steve Cooper, Wharton County, and nominated Cooper to serve on the Lavaca Regional Water Planning Group representing Agricultural, Wharton County. Weinheimer seconded the motion. Motion passed.

Brzozowski introduced Dennis Simons, Jackson County Judge, and nominated Simons to serve on the Lavaca Regional Water Planning Group representing Counties, Jackson County. Ottis seconded the motion. Motion passed.

Maloney introduced Bart McBeth, Lavaca County, and nominated McBeth to serve on the Lavaca Regional Water Planning Group representing Agricultural, Lavaca County. Putska seconded the motion. Motion passed.

Conduct Election of Officers

Weinheimer moved to re-elect Brzozowski as Secretary of the Lavaca Regional Water Planning Group. G Skalicky seconded the motion. Motion passed.

Brzozowski moved to nominate Hudgins to serve as Vice Chairman of the Lavaca Regional Water Planning Group. Weinheimer seconded the motion. Motion passed.

Weinheimer moved to nominate Spenrath to serve as Chairman of the Lavaca Regional Water Planning Group. M Skalicky seconded the motion. Motion passed.

Putska moved to nominate the Executive Committee as follows: Spenrath, Hudgins, Brzozowski, Coleman, Day, Maloney, and Weinheimer. Weinheimer seconded the motion. Motion passed.

Briefing and Update from Texas Water Development Board

Ellis briefed the Group via Power Point presentation on the Texas Water Development Board Update on revised 31 Texas Administrative Code Rules, Chapters 355 and 357. A copy of the presentation is attached to these minutes.

Briefing from AECOM Consultant

Burke briefed the Group on the following:

- Update on process and progress, including project status to date.
- Presentation of final population and water demand projections.
- Discussion of water availability and supplies.
- Discussion of wholesale water providers and major water providers.
- Upcoming work effort and timeline.

The Group was presented a copy of the information including final population and water demand projections, and wholesale water providers and major water providers.

Identifying Potentially Feasible Water Management Strategies

Burke briefed the Group on the process on identifying potentially feasible water management strategies according to the Texas Water Development Board guidelines for Water Management Strategies. Burke presented the Lavaca Region Identifiction Process for Potentially Feasible Water Management Strategies.

There were no public comments.

Brzozowski moved to approve the process on identifying potentially feasible water management strategies as presented to the Group. Weinheimer seconded the motion. Motion passed.

Regional Water Planning Contract Amendment

Ellis briefed the Group on the proposed regional water planning contract amendment with TWDB for additional funding. The additional committed funds of $83,547 will bring the total committed funds amount to $122,544.

Brzozowski moved to approve Lavaca-Navidad River Authority (LNRA) as the contracting entity, to execute the contract amendment with TWDB for additional funding as presented and to negotiate with the TWDB for additional funding if available. M Skalicky seconded the motion. Motion passed.

Future Meeting Dates

Meetings are to be scheduled in June and September. A poll via email will be taken of the members to determine a date in which the majority can attend.

Public Comments

There were no public comments.

The meeting adjourned at 2:20 p.m.

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Phillip Spenrath
Chairman

Minutes of Lavaca Regional Water Planning Group
April 16, 2018
Edna, Texas

A meeting of the Lavaca Regional Water Planning Group was held in the Meeting Room of the Lavaca Navidad River Authority Office Complex, 4631 FM 3131, located approximately seven (7) miles east of Edna, Jackson County, Texas off FM 3131 on Monday, April 16, 2018 at noon.

Voting Group Members present were: Patrick Brzozowski, Tom Chandler, Marie Day, Neil Hudgins, Jack Maloney, Richard Ottis, Edward Pustka, L.G. Raun, Gary Skalicky, Michael Skalicky, Phillip Spenrath, Chairman Harrison Stafford II, and Ed Weinheimer.

Absent Voting Group Members were: John Butschek, Jim Coleman, Robert Martin, Robert Shoemate and David Wagner.

Also present was: Ron Ellis and Elizabeth McCoy of Texas Water Development Board, Jaime Burke of AECOM, Josh Harper of Texas Parks and Wildlife Department, Mike Rivet of Formosa Plastics Corporation, Rusty Ray of Texas State Soil and Water Conservation Board, Dennis Simons, Steve Cooper, and Bart McBeth, public. Also present was Ronald Kubecka, LNRA Board President, Jerry Adelman, LNRA Board Vice President, Doug Anders, LNRA Deputy General Manager, Operations, and Karen Gregory, LNRA Deputy General Manager, Administration.

Chairman Stafford called the meeting to order.

Public Comments

There were no public comments.

Minutes

The minutes of the October 2, 2017 meeting were reviewed. M Skalicky moved to approve the minutes as presented. Weinheimer seconded the motion. Motion passed.

Accept Resignation

Brzozowski informed the Board that Chairman Stafford had submitted his resignation letter to the Lavaca Regional Water Planning Group.

Brzozowski moved to accept the resignation, with regrets, from Harrison Stafford II as Chairman and voting member of the Lavaca Regional Water Planning Group. Ottis seconded the motion. Motion passed.

Vice Chairman Raun announced his resignation from the Lavaca Regional Water Planning Group.

Brzozowski moved to accept the resignation, with regrets, from L.G. Raun as Vice Chairman and voting member of the Lavaca Regional Water Planning Group. Ottis seconded the motion. Motion passed.

Resolution Presentation to Harrison Stafford II

Brzozowski presented Stafford with a Resolution recognizing his diligence in carrying out the duties and responsibilities while serving twenty years on the Lavaca Regional Water Planning Group.

M Skalicky moved to approve the Resolution as presented. Maloney seconded the motion. Motion passed.

Nominations for New Voting Members

Raun introduced Steve Cooper, Wharton County, and nominated Cooper to serve on the Lavaca Regional Water Planning Group representing Agricultural, Wharton County. Weinheimer seconded the motion. Motion passed.

Brzozowski introduced Dennis Simons, Jackson County Judge, and nominated Simons to serve on the Lavaca Regional Water Planning Group representing Counties, Jackson County. Ottis seconded the motion. Motion passed.

Maloney introduced Bart McBeth, Lavaca County, and nominated McBeth to serve on the Lavaca Regional Water Planning Group representing Agricultural, Lavaca County. Putska seconded the motion. Motion passed.

Conduct Election of Officers

Weinheimer moved to re-elect Brzozowski as Secretary of the Lavaca Regional Water Planning Group. G Skalicky seconded the motion. Motion passed.

Brzozowski moved to nominate Hudgins to serve as Vice Chairman of the Lavaca Regional Water Planning Group. Weinheimer seconded the motion. Motion passed.

Weinheimer moved to nominate Spenrath to serve as Chairman of the Lavaca Regional Water Planning Group. M Skalicky seconded the motion. Motion passed.

Putska moved to nominate the Executive Committee as follows: Spenrath, Hudgins, Brzozowski, Coleman, Day, Maloney, and Weinheimer. Weinheimer seconded the motion. Motion passed.

Briefing and Update from Texas Water Development Board

Ellis briefed the Group via Power Point presentation on the Texas Water Development Board Update on revised 31 Texas Administrative Code Rules, Chapters 355 and 357. A copy of the presentation is attached to these minutes.

Briefing from AECOM Consultant

Burke briefed the Group on the following:

- Update on process and progress, including project status to date.
- Presentation of final population and water demand projections.
- Discussion of water availability and supplies.
- Discussion of wholesale water providers and major water providers.
- Upcoming work effort and timeline.

The Group was presented a copy of the information including final population and water demand projections, and wholesale water providers and major water providers.

Identifying Potentially Feasible Water Management Strategies

Burke briefed the Group on the process on identifying potentially feasible water management strategies according to the Texas Water Development Board guidelines for Water Management Strategies. Burke presented the Lavaca Region Identifiction Process for Potentially Feasible Water Management Strategies.

There were no public comments.

Brzozowski moved to approve the process on identifying potentially feasible water management strategies as presented to the Group. Weinheimer seconded the motion. Motion passed.

Regional Water Planning Contract Amendment

Ellis briefed the Group on the proposed regional water planning contract amendment with TWDB for additional funding. The additional committed funds of $83,547 will bring the total committed funds amount to $122,544.

Brzozowski moved to approve Lavaca-Navidad River Authority (LNRA) as the contracting entity, to execute the contract amendment with TWDB for additional funding as presented and to negotiate with the TWDB for additional funding if available. M Skalicky seconded the motion. Motion passed.

Future Meeting Dates

Meetings are to be scheduled in June and September. A poll via email will be taken of the members to determine a date in which the majority can attend.

Public Comments

There were no public comments.

The meeting adjourned at 2:20 p.m.

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Phillip Spenrath
Chairman

Minutes of Lavaca Regional Water Planning Group
June 18, 2018
Edna, Texas

A meeting of the Lavaca Regional Water Planning Group was held in the Meeting Room of the Lavaca Navidad River Authority Office Complex, 4631 FM 3131, located approximately seven (7) miles east of Edna, Jackson County, Texas off FM 3131 on Monday, June 18, 2018 at noon.

Voting Group Members present were: Patrick Brzozowski, Tom Chandler, Jim Coleman, Marie Day, Neil Hudgins, Jack Maloney, Bart McBeth, Richard Ottis, Robert Shoemate, Dennis Simons, Gary Skalicky, and Michael Skalicky.

Absent Voting Group Members were: John Butschek, Steve Cooper, Robert Martin, Edward Pustka, Phillip Spenrath, David Wagner, and Ed Weinheimer.

Also present was: Elizabeth McCoy of Texas Water Development Board, Jaime Burke of AECOM, Josh Harper of Texas Parks and Wildlife Department, Tony Franklin of Texas State Soil and Water Conservation Board, Esteban Ramos of City of Corpus Christi, and Jami McCool, Texas Department of Agriculture. Also present was Ronald Kubecka, LNRA Board President, Doug Anders, LNRA Deputy General Manager, Operations, and Karen Gregory, LNRA Deputy General Manager, Administration.

Vice Chairman Hudgins called the meeting to order.

Public Comments

There were no public comments.

Minutes

The minutes of the April 16, 2018 meeting were reviewed. M Skalicky moved to approve the minutes as presented. Ottis seconded the motion. Motion passed.

Nominations for New Voting Members

Brzozowski reported that the Group should continue the solicitation of a new voting member for Lavaca County, Small Business.

Briefing and Update from Texas Water Development Board

McCoy briefed the Group on the following:

- Revised 31 Texas Administrative Code Rules are on the TWDB website, Regional Water Planning, 5th Planning Cycle.
- Flood Assessment report will be posted for public comments this summer.

- Reminder that the Technical Memo is due September 10, 2018.
- Identification of Major Water Providers.

Briefing from AECOM Consultant

Burke briefed the Group on the following:

- Update on process and progress, project status to date and timeline.
- Discussed existing water supplies, including the survey responses.
- Initial identification of water needs in the region.
- Discussed potentially feasible water management strategies, including the survey responses.

Submittal of Hydrologic Variance Request to TWDB

Burke briefed the Group on the surface water modeling assumptions and the associated hydrologic variance request. The Group was presented via power point information which supported LRWPG request to utilize a modified Texas Commission on Environmental Quality (TCEQ) Water Availabiltiy Model (WAM) Run 3 for surface water availability modeling in the 2021 Lavaca Regional Water Plan development (Hydrologic Variance Request). The Group was also presented a draft letter to TWDB requesting the hydrologic variance.

M Skalicky moved to approve the surface water availability modeling assumption for supplies and strategies and submittal of the associated hydrologic varance request to TWDB as presented. Brzozowski seconded the motion. Motion passed.

Potential Major Water Providers

Burke briefed the Group on the potential Major Water Providers (MWP). A MWP should be of particular significance to the region's water supply as determined by the RWPG, responsible for developing and/or delivering significant quantities of water in the region, and more data is reported for this category in the Plan.

Day moved to identify Lavaca-Navidad River Authority (LNRA) as the single Major Water Provider in the region. Ottis seconded the motion. Motion passed.

Future Meeting Dates

A Region P meeting is tentatively scheduled for Monday, August 6, 2018.

Public Comments

There were no public comments.

The meeting adjourned at 1:20 p.m.

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Phillip Spenrath
Chairman

6) Addressing Drought Conditions.

6.1 Objective – Each month, the District will download the updated Palmer Drought Severity Index (PDSI) map and other related information from the National Weather Service – Climate Prediction Center website. Additional information is available from TWDB at the following website:
http://waterdatafortexas.org/drought/
6.1 Performance Standard – Quarterly, the District will make an assessment of the status of drought in the District and prepare a quarterly briefing to the Board of Directors. The downloaded PDSI maps and other related information will be included with copies of the quarterly briefing in the District Annual Report to the Board of Directors.

NOTICE OF PUBLIC MEETING

Coastal Bend Groundwater Conservation District
Tuesday, March 13, 2018
8:00 a.m.
CBGCD Office
109 E Milam, Wharton, TX 77488
(979) 531-1412

Notice is hereby given in accordance with the Open Meetings Act, Chapter 551, Government Code and Section 36.064 of the Texas Water Code that the Board of Directors of the Coastal Bend Groundwater Conservation District will hold a meeting at the above stated place and time to consider the following agenda items.

AGENDA

I. Call to Order
II. Public Comments / Announcements.
III. Approval of February 07, 2018 Meeting Minutes. (Action Item)
IV. Approval of February 07, 2018 Permit Hearing Minutes. (Action Item)
V. Manager's Report
   a) Financial Report. (Action Item)
   b) 2017 Water Use Report
   c) Well Monitoring Report.
   d) Upcoming Meetings.
VI. Audit Presentation by Harry Afadapa & Associates. (Action Item)
VII. Discussion to Approve Permit Applications. (Action Item)
VIII. Discuss and Consider Amendments to CBGCD Management Plan. (Action Item)
IX. Litigation update
   a) City of Conroe, et al v. Lone Star Groundwater Conservation District, et al (District Court)
   b) Fazzino v Brazos Valley Groundwater Conservation District (Robertson County District Court)
   c) Recharge Texas (End Op) v Environmental Stewardship (3rd Court of Appeals)
   d) Cockrell Investment Partners, Ltd. v Middle Pecos Groundwater Conservation District (Pecos County District Court)
   e) Uvalde County Underground Water Conservation District v Edwards Aquifer Authority (Uvalde County District Court)
X. Legislative Report
XI. PDSI/Situation Report
XII. Possible Future Agenda Items
XIII. Public Comments / Announcements
XIV. Set Next Meeting Date and Agenda. (Action Item)
XV. Adjournment.

The Board of Directors of the Coastal Bend Groundwater Conservation District reserves the right to adjourn into Executive (Closed) Session at any time during the course of this meeting to discuss items listed on this agenda, as authorized by the Texas Government Code, Sections 551.071 (Consultations with Attorney), 551.072 (Deliberations about Real Property), 551.073 (Deliberations about Gifts and Donations), 551.074 (Personnel Matters), 551.076 (Deliberations about Security Devices) and 551.086 (Economic Development). No final action will be taken in Executive Session.

The Coastal Bend Groundwater Conservation District is committed to compliance with the Americans with Disability Act. Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the District office at least 24 hours in advance if accommodation is needed.

NOTICE OF PUBLIC MEETING

Coastal Bend Groundwater Conservation District
Wednesday, July 25, 2018
8:00 a.m.
CBGCD Office
109 E Milam, Wharton, TX 77488
(979) 531-1412

Notice is hereby given in accordance with the Open Meetings Act, Chapter 551, Government Code and Section 36.064 of the Texas Water Code that the Board of Directors of the Coastal Bend Groundwater Conservation District will hold a meeting at the above stated place and time to consider the following agenda items.

AGENDA

I. Call to Order
II. Public Comments / Announcements.
III. Approval of May 08, 2018 Meeting Minutes. (Action Item)
IV. Approval of May 08, 2018 Permit Hearing Minutes. (Action Item)
V. Manager's Report
   a) Financial Report. (Action Item)
   b) Quarterly Investment Report. (Action Item)
   c) Well Monitoring Report.
   d) Upcoming Meetings.
VI. Discussion to Approve Permit Applications. (Action Item)
VII. Review Preliminary 2018-2019 Budget. (Action Item)
VIII. Discuss and Review Auditor Proposals. (Action Item)
IX. Order an Election of Directors for November 6th, 2018, noting this election will be cancelled if no opposing applications are received by 5:00 p.m., August 20th, 2016. (Action Item)
X. Litigation update
   a) City of Conroe, et al v. Lone Star Groundwater Conservation District, et al (District Court)
   b) Fazzino v Brazos Valley Groundwater Conservation District (Robertson County District Court)
   c) Recharge Texas (End Op) v Environmental Stewardship (3rd Court of Appeals)
   d) Cockrell Investment Partners, Ltd. v Middle Pecos Groundwater Conservation District (Pecos County District Court)
   e) Uvalde County Underground Water Conservation District v Edwards Aquifer Authority (Uvalde County District Court)
   f) Post Oak
XI. Legislative Report
XII. PDSI/Situation Report
XIII. Executive Session, as allowed under Section 551.01 of the Texas Open Meetings Act Government Code, specifically Section 551.074 Revised Statutes of Texas to discuss appointment, employment, evaluation, reassignment, duties, discipline, or dismissal of personnel. (Staff Performance Evaluations)
XIV. Reconvene in Open Session and take any appropriate action subsequent to discussion in Executive Session. (Possible Action Item)
XV. Possible Future Agenda Items
XVI. Public Comments / Announcements
XVII. Set Next Meeting Date and Agenda. (Action Item)
XVIII. Adjournment.

The Board of Directors of the Coastal Bend Groundwater Conservation District reserves the right to adjourn into Executive (Closed) Session at any time during the course of this meeting to discuss items listed on this agenda, as authorized by the Texas Government Code, Sections 551.071 (Consultations with Attorney), 551.072 (Deliberations about Real Property), 551.073 (Deliberations about Gifts and Donations), 551.074 (Personnel Matters), 551.076 (Deliberations about Security Devices) and 551.086 (Economic Development). No final action will be taken in Executive Session.

The Coastal Bend Groundwater Conservation District is committed to compliance with the Americans with Disability Act. Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the District office at least 24 hours in advance if accommodation is needed.

NOTICE OF PUBLIC MEETING

Coastal Bend Groundwater Conservation District
Tuesday, September 11, 2018
8:00 a.m.
CBGCD Office
109 E Milam, Wharton, TX 77488
(979) 531-1412

Notice is hereby given in accordance with the Open Meetings Act, Chapter 551, Government Code and Section 36.064 of the Texas Water Code that the Board of Directors of the Coastal Bend Groundwater Conservation District will hold a meeting at the above stated place and time to consider the following agenda items.

AGENDA

I. Call to Order
II. Public Comments / Announcements.
III. Approval of August 14, 2018 Meeting Minutes. (Action Item)
IV. Approval of August 14, 2018 Permit Hearing Minutes. (Action Item)
V. Manager's Report
   a) Financial Report. (Action Item)
   b) Well Monitoring Report.
   c) Upcoming Meetings.
VI. Cancel Election of Directors for November 06, 2018. (Action Item)
VII. Discussion to Approve Permit Applications. (Action Item)
VIII. Discuss Possible Budget Amendments Regarding 2017-2018 FY Budget. (Action Item)
IX. Discuss Possible Adoption of 2018-2019 Budget. (Action Item)
X. Discuss Possible Adoption 2018-2019 Tax Rate. (Action Item)
XI. Review and Discuss CBGCD Rules on Spacing and Screening Requirements. (Action Item)
XII. Litigation update
   a) Review and Discuss Current AG Opinion Request RE: GCD Authority on Defining Agricultural Irrigation
   b) City of Conroe, et al v. Lone Star Groundwater Conservation District, et al (Montgomery County District Court)
   c) Fazzino v Brazos Valley Groundwater Conservation District (Federal District Court—Waco Division)
   d) Recharge Texas (End Op) v Environmental Stewardship (3rd Court of Appeals)
   e) Cockrell Investment Partners, Ltd. v Middle Pecos Groundwater Conservation District (Pecos County District Court)
   f) Uvalde County Underground Water Conservation District v Edwards Aquifer Authority (Uvalde County District Court)
XIII. Legislative Report
XIV. PDSI/Situation Report
XV. Possible Future Agenda Items
XVI. Public Comments / Announcements
XVII. Set Next Meeting Date and Agenda. (Action Item)
XVIII. Adjournment.

The Board of Directors of the Coastal Bend Groundwater Conservation District reserves the right to adjourn into Executive (Closed) Session at any time during the course of this meeting to discuss items listed on this agenda, as authorized by the Texas Government Code, Sections 551.071 (Consultations with Attorney), 551.072 (Deliberations about Real Property), 551.073 (Deliberations about Gifts and Donations), 551.074 (Personnel Matters), 551.076 (Deliberations about Security Devices) and 551.086 (Economic Development). No final action will be taken in Executive Session.

The Coastal Bend Groundwater Conservation District is committed to compliance with the Americans with Disability Act. Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the District office at least 24 hours in advance if accommodation is needed.

7) Addressing Conservation, Recharge Enhancement, Rainwater Harvesting, Precipitation Enhancement, or Brush Control, where appropriate and cost-effective.

Conservation

7.1 Objective – The District will annually submit an article regarding water conservation for publication to at least one newspaper of general circulation in the District.
7.1 Performance Standard – A copy of the article submitted by the District for publication
to a newspaper of general circulation in the District regarding water conservation will be included in the Annual Report to the Board of Directors.

7.2 Objective – The District will develop or implement a pre-existing educational program for use in public or private schools located in the District to educate students on the importance of water conservation.
7.2 Performance Standard – A summary of the educational program developed or implemented by the District for use in public or private schools located in the District will be included in the Annual Report to the Board of Directors for every year this plan is active.

7.3 Objective – Each year, the District will include an informative flier on water conservation with at least one mail out to groundwater use permit holders distributed in the normal course of business for the District.
7.3 Performance Standard – The District's Annual Report will include a copy of the informative flier distributed to groundwater use permit holders regarding water conservation and the number of fliers distributed.

Recharge Enhancement

7.4 Objective – Each year, the District will provide one article relating to recharge enhancement on the District web site.
7.4 Performance Standard – Each year, the District annual report will include a copy of the information that has been provided on the District web site relating to recharge enhancement.

Precipitation Enhancement

Precipitation enhancement is not an appropriate or cost-effective program for the District at this time because there is not an existing precipitation enhancement program operating in nearby counties in which the District could participate and share costs. The cost of operating a single-county precipitation enhancement program is prohibitive and would require the District to increase taxes. Therefore, this goal is not applicable to the District at this time.

Brush Control

7.5 Objective – Each year, the District will provide one article relating to Brush Control on the District web site.

7.5 Performance Standard – Each year, the District annual report will include a copy of the information that has been provided on the District web site relating to Brush Control.

Rainwater Harvesting

7.6 Objective – Each year, the District will provide one article relating to Rainwater Harvesting on the District web site.

7.6 Performance Standard – Each year, the District annual report will include a copy of the information that has been provided on the District web site relating to Rainwater Harvesting.

Water conservation promoted

Special to the Journal-Spectator

Although Wharton County has had its share of rainfall throughout 2017, the Coastal Bend Groundwater Conservation District urges continued practice of conserving and preserving the groundwater that underlies the county.

Learning how to conserve the region's most precious resource takes a team effort, with large-scale users and smaller well owners all chipping in to do their part. This effort will become even more critical with the state's population expected to double by 2050.

Most of the state's groundwater comes from nine major aquifers and 20 minor aquifers.

The major aquifer underlying Wharton County is known as the Gulf Coast Aquifer. Of the groundwater used in Wharton County, about 96 percent is used for agricultural irrigation. Another 3 percent is used by municipalities/commercial uses, and the remainder is utilized for domestic and livestock purposes.

Wharton County has always enjoyed an abundant source of groundwater. The only way to continue to be able to pass on that enjoyment to our future generations is to be good stewards and conserve the resource.

Some conservation tips to consider are:

For homeowners: Shorten showers by at least two minutes; wash only full loads of clothes; use shorter dishwasher cycles; turn off the tap while brushing teeth or shaving; and sweep off driveways and sidewalks instead of power washing;

For agricultural users: Use land leveling; implement brush control management; line irrigation channels; replace irrigation channels with underground pipelines; install low pressure center pivot sprinklers; and use gated and flexible pipe for water distribution systems

For more information, contact the district at 979-531-1412 or on the web at www.cbgcd.com.

Neil Hudgins

From: Neil Hudgins <nhudgins@cbgcd.com>
Sent: Thursday, February 15, 2018 3:01 PM
To: 'tkulak@bolingisd.net'; 'ksanchez@bolingisd.net'
Subject: Major Rivers Water Conservation Educational Program

2-15-18

Dear Wharton County 4th & 5th Science Teachers,

The Coastal Bend Groundwater Conservation District would like to remind you all that our local GCD has offered to purchase all curriculum materials for Majors Rivers, a water conservation program that was established by the Texas Water Development Board that educates kids on the importance of conserving water. Please visit http://www.twdb.texas.gov/conservation/education/kids/MajorRivers/ for more information about this education program.

If you are interested, please respond to Neil Hudgins nhudgins@cbgcd.com no later than February 23rd in order for us to make the order deadline. We will need to know the amount of materials and educational packages you may need.

Best Regards,

Neil Hudgins
Coastal Bend GCD/Coastal Plains GCD
(979)531-1412 office
(979)531-1002 fax
nhudgins@cbgcd.com

Neil Hudgins

From: Neil Hudgins <nhudgins@cbgcd.com>
Sent: Thursday, February 15, 2018 3:13 PM
To: 'patricia.orsak@ebisd.org'; 'susan.kresta@ebisd.org'
Subject: Major Rivers Water Conservation Educational Program

2-15-18

Dear Wharton County 4th & 5th Science Teachers,

The Coastal Bend Groundwater Conservation District would like to remind you all that our local GCD has offered to purchase all curriculum materials for Majors Rivers, a water conservation program that was established by the Texas Water Development Board that educates kids on the importance of conserving water. Please visit http://www.twdb.texas.gov/conservation/education/kids/MajorRivers/ for more information about this education program.

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nhudgins@cbgcd.com

Neil Hudgins

From: Neil Hudgins <nhudgins@cbgcd.com>
Sent: Thursday, February 15, 2018 3:20 PM
To: 'skonvicka@whartonisd.net'; 'dmareth@whartonisd.net'
Subject: Major Rivers Water Conservation Educational Program

2-15-18

Dear Wharton County 4th & 5th Science Teachers,

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Neil Hudgins
Coastal Bend GCD/Coastal Plains GCD
(979)531-1412 office
(979)531-1002 fax
nhudgins@cbgcd.com

Neil Hudgins

From: Neil Hudgins <nhudgins@cbgcd.com>
Sent: Thursday, February 15, 2018 3:24 PM
To: 'lhlavaty@ecisd.org'
Subject: Major Rivers Water Conservation Educational Program

2-15-18

Dear Wharton County 4th & 5th Science Teachers,

The Coastal Bend Groundwater Conservation District would like to remind you all that our local GCD has offered to purchase all curriculum materials for Majors Rivers, a water conservation program that was established by the Texas Water Development Board that educates kids on the importance of conserving water. Please visit http://www.twdb.texas.gov/conservation/education/kids/MajorRivers/ for more information about this education program.

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Neil Hudgins
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(979)531-1412 office
(979)531-1002 fax
nhudgins@cbgcd.com

Neil Hudgins

From: Neil Hudgins <nhudgins@cbgcd.com>
Sent: Thursday, February 15, 2018 3:27 PM
To: 'omendez@louiseisd.net'
Subject: Major Rivers Water Conservation Educational Program

2-15-18

Dear Wharton County 4th & 5th Science Teachers,

The Coastal Bend Groundwater Conservation District would like to remind you all that our local GCD has offered to purchase all curriculum materials for Majors Rivers, a water conservation program that was established by the Texas Water Development Board that educates kids on the importance of conserving water. Please visit http://www.twdb.texas.gov/conservation/education/kids/MajorRivers/ for more information about this education program.

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Best Regards,

Neil Hudgins
Coastal Bend GCD/Coastal Plains GCD
(979)531-1412 office
(979)531-1002 fax
nhudgins@cbgcd.com

Neil Hudgins

From: Susan Kresta <susan.kresta@ebisd.org>
Sent: Sunday, February 18, 2018 11:24 PM
To: Neil Hudgins
Subject: Re: Major Rivers Water Conservation Educational Program

Mr. Hudgins,

Thank you for including the fourth grade in this opportunity to receive the Major Rivers curriculum. I look forward to including this information throughout the next school year in both Science and Social Studies classes.

2018-2019 school year:
60-65 students / 1 teacher

only participant

Thank you,
Susan Kresta
4th Grade Teacher
Science/Social Studies
East Bernard Elementary

On Thu, Feb 15, 2018 at 3:12 PM, Neil Hudgins <nhudgins@cbgcd.com> wrote:

2-15-18

Dear Wharton County 4th & 5th Science Teachers,

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Best Regards,

Neil Hudgins

Coastal Bend GCD/Coastal Plains GCD

(979)531-1412 office

(979)531-1002 fax

nhudgins@cbgcd.com

Agricultural Water Conservation
Irrigation Water Use Management

BEST MANAGEMENT PRACTICES

Texas Water Development Board
Conservation Division

No one knows better than Texas farmers and ranchers that agriculture depends on water. Because our state is prone to drought, the lack of water often limits the production of food and fiber crops. As a result, producers often rely on irrigation to provide sufficient water for agricultural needs. In arid areas, crop production is not possible without irrigation water. In semiarid areas, irrigation water increases crop yields and quality. In humid areas, supplemental irrigation increases yields for certain specialty crops. For many Texas producers, irrigation water is essential and will continue to be so, especially during periods of erratic rainfall and drought. However, with declining water supplies in many areas of the state and the escalating need to conserve water, producers must address the challenge of managing their irrigation water use as efficiently as possible.

The primary objective of this booklet is to inform agricultural irrigators, irrigation water districts, and groundwater conservation districts about irrigation water use management practices. The practices are explained, and guidelines on how to adopt these practices are suggested. The best management practices (BMP) that together form the core of irrigation water use management are:

BMP 01 Irrigation scheduling

BMP 02 Measurement of irrigation water use

BMP 03 Crop residue management and conservation tillage

BMP 04 Irrigation audit

Irrigation systems

To irrigate effectively, the right amount of water has to reach the right place at the right time. Generally, greater amounts are applied with gravity systems than with sprinkler and micro-irrigation systems. The common types of irrigation methods in Texas are given in Table 1.

Table 1. Irrigation systems and methods used in Texas

System	Method	Description
Surface (Gravity)	Flood	Water is diverted from ditches to fields or pastures
	Furrow	Water is channeled down furrows for row crops or fruit trees
	Border	Water is applied to sloping strips of fields bordered by ridges
	Surge	Valves control delivery of water to fields in intermittent surges
Sprinkler (Pressurized)	Pivot & linear systems	High pressure
		Medium pressure
		Low pressure
	Side rolls	Mobile pipelines deliver water across fields using sprinklers
	Solid set	Pipes placed on fields deliver water from raised sprinkler heads
Micro-irrigation (Pressurized)	Surface	Emitters along pipes or hoses deliver water directly to the soil surface
	Sub-surface	Emitters along pipes or hoses deliver water below the soil surface
	Micro-sprinklers	Emitters on short risers or suspended by drop tubes sprinkle or spray water above the soil surface

BMP 01: IRRIGATION SCHEDULING

Irrigation scheduling is a practical tool for preventing the over-application of water while optimizing crop growth. Most producers know how much it takes to irrigate fields and avoid crop stress during average conditions. With erratic rainfall, however, it becomes difficult to apply enough water to fill the effective root zone without unnecessary deep percolation or runoff.

Why schedule irrigation?

Efficient irrigation scheduling can significantly reduce the amount of irrigation water pumped and avoid excessive energy use. By managing irrigation systems to use as much rainfall as possible, producers do not have to pump water from aquifers or use water released from reservoirs. Two of the most important decisions an irrigator has to make are when to start and stop irrigating each season. To help make those decisions, the producer should monitor the moisture content of the soil and assess the actual irrigation system capacity. This information is critical for keeping tabs on the ability of the individual irrigation system to keep up or catch up with crop water demand. Despite lower water use rates in the early growing season, the soil may dry quickly without the producer realizing it. As a result, the irrigation system may not be able to catch up with the crop water demand, and the crop yield may suffer. Delaying irrigation for as long as possible is desirable, provided that it does not cause yield reduction.

How do I schedule irrigation?

At the start of the season, producers should plan a strategy that encompasses decisions about when and where to irrigate and how much water to apply. The strategy should be based on a good understanding of crop water use. The advantages and limitations of the three popular methods of measuring crop water use are presented in Table 2.

Table 2. Three methods of measuring crop water use

Soil moisture measurements	Throughout the growing season, producers need to know the current moisture status of the soil. There are several soil moisture tools and devices available on the market. Each of these devices has distinct advantages and limitations. Discuss your options with an irrigation expert before using one.
Plant water measurements	The plant is the link between the soil and the atmosphere. Its water status provides an indication of when to irrigate. Because individual plants are measured, this method is more commonly used for orchards and tree crops.
Evapotranspiration measurements	Water use data from an automated evapotranspiration network is generally processed at central locations and broadcasted in near-real time. The evapotranspiration network information can be used to improve your decision making for irrigation scheduling. Discuss training sessions with an irrigation expert.

Where can I find more information?

Using soil moisture measurements combined with water requirement predictions from the evapotranspiration network is the most effective method for making decisions on scheduling irrigation. However, adopting both methods in tandem is a formidable task. The practical option for producers is to engage in experiential learning. Observe keenly the practicality of adopting each of the methods in your production system. Participating in irrigation training workshops or peer training can help producers determine which methods are most appropriate for them. The U.S. Department of Agriculture's Agricultural Research Service, Texas AgriLife Research and AgriLife Extension, and Texas Tech University conduct formal training sessions and workshops. These usually include tours to fields equipped with soil moisture probes and evapotranspiration network stations. The Texas Water Development Board (TWDB) has worked closely with all three institutions on training. For additional technical information and for opportunities on possible training and tours, please visit these Web sites:

http://www.ars.usda.gov/main/site_main.htm?modecode=62-09-05-05
http://txhighplainset.tamu.edu/
http://texaset.tamu.edu/

BMP 02: MEASUREMENT OF IRRIGATION WATER USE

Measuring water use is a key step in managing irrigation water use. Producers may choose from several technologies, methods, and calculations to assist them with this practice. In Texas, some producers use meters to measure their water use, and others rely on automated water canal delivery information systems. The automated system allows irrigation district personnel to open or close gates at pumping stations and monitor flow rates from a remote location.

Why measure irrigation water use?

Measuring irrigation water use provides critical information to the State of Texas, producers, local groundwater conservation districts, irrigation districts, and regional water planning groups. Because agricultural irrigation currently accounts for about 60 percent of all water demand in Texas, state planners need accurate information on irrigation water use to estimate future needs. Groundwater conservation districts and irrigation districts rely on irrigation water use information to quantify the effects of water withdrawals on aquifers and surface water sources, which assists these groups in responsible resource management. Some groundwater conservation districts require producers to report irrigation amounts for every growing season, using the data to estimate the volume of water pumped within their territorial jurisdiction. The water use information also assists regional water planning groups in projecting future water supplies in their areas.

How do I measure irrigation water use?

There are numerous methods for measuring water use, and some are listed in Table 3.

TWDB manages a voluntary irrigation metering program to monitor irrigation water use at producers' sites. Through this program, financial assistance is provided to local districts to install meters in producers' fields. Currently, four groundwater conservation districts are participating in the program, and together they report data from over 430 irrigation meters. TWDB has also funded the construction of a few facilities in the Lower Rio Grande Valley and in the Texas High Plains to provide

meter calibration services to producers. More recently, TWDB awarded contracts to some irrigation districts to develop and test low-cost canal gates for surface water delivery systems.

Table 3. Flow measurement methods commonly used in Texas

Direct measurements for closed channels and pipelines	Propeller or impeller meters
	Orifice, venturi, or differential pressure meters
	Magnetic flux meters (both insertion and flange mount)
	Ultrasonic meters (travel-time method)
Direct measurements for open channels	Weirs and flumes
	Stage discharge rating tables
	Area/point velocity measurements
	Ultrasonic (doppler and travel time methods)
Indirect measurements	Energy used by a pumping plant
	Elevation change of water level in a storage reservoir
	Timing and estimated flow rate

Where can I find more information?

To see if you qualify for federal funding assistance to defray the costs of flow meters, visit your local Natural Resources Conservation Service office. Some groundwater conservation districts and irrigation water districts may also share some of the capital costs by using TWDB grants.

References

Enciso, J., Santistevan, D., and Hla, A., 2007, Propeller flow meter: Texas AgriLife Extension publication number L-5492, 4 p.

Martin, E., 2009, Measuring water flow and rate on the farm: Arizona Cooperative Extension publication number AZ 1130, 4 p.

BMP 03: CROP RESIDUE MANAGEMENT AND CONSERVATION TILLAGE

Crop residue management and conservation tillage are two separate practices but are considered one best management practice because they are closely related. Crop residue management conserves some of the remains of a previous crop on a field. Generally, crop residue can be left in situ during harvest with a combine or spreader. Conservation tillage reduces the intensity of soil-disturbing operations, often limiting tillage passes. Different tillage systems include no till, mulch till, strip till, and ridge till. Producers should consider integrating these practices and implementing them in tandem to maximize conservation benefits.

Why adopt residue management and conservation tillage?

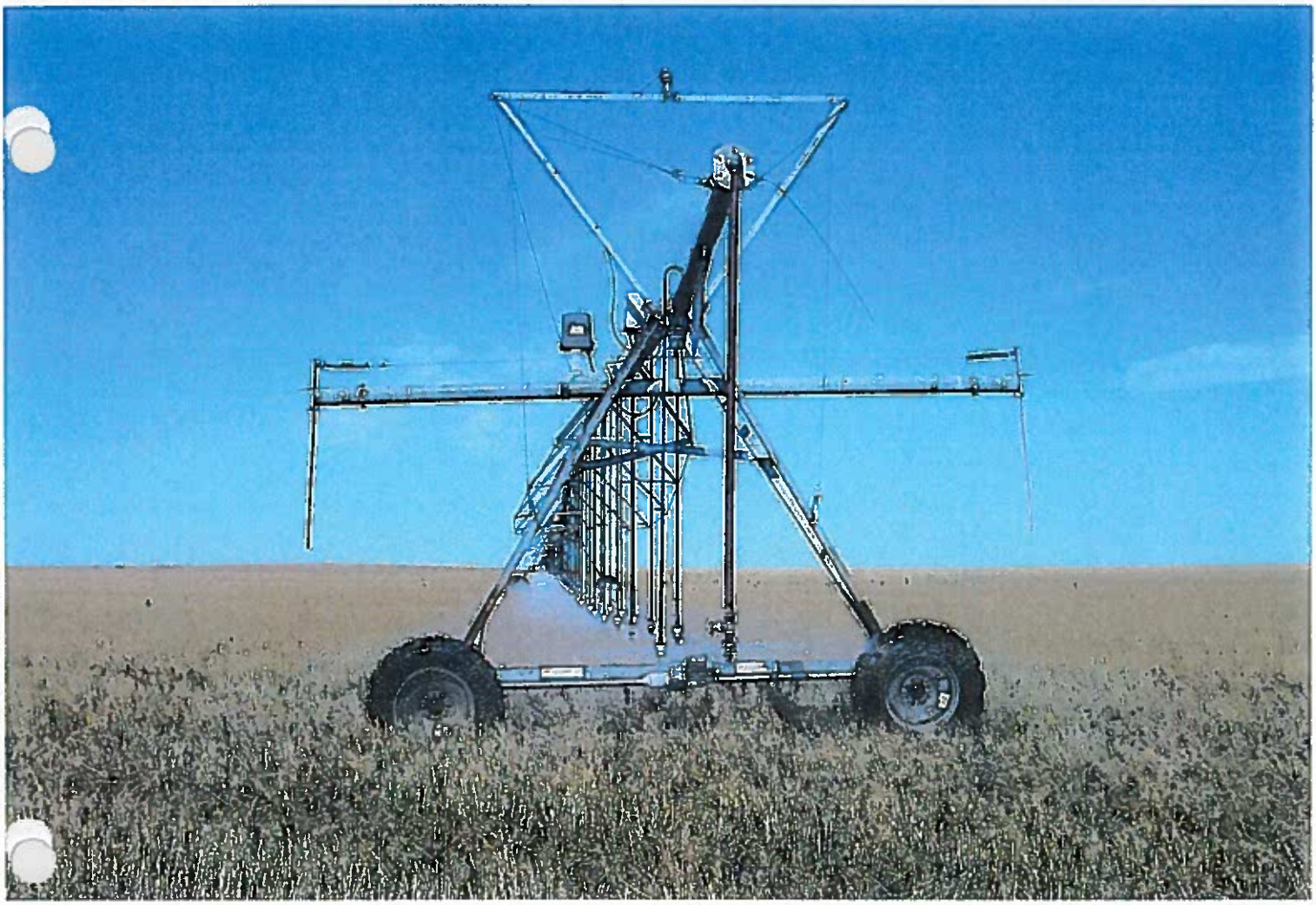
Crop residue management helps reduce soil erosion, captures precipitation (snow and rain), and reduces runoff. In the long term, the practice may improve soil physical properties by adding organic matter to the soil and enhancing soil health. Keeping the crop residue even across the field is essential for spreading nutrients uniformly and shielding new plants from adverse weather conditions. Residue covering 30 percent of a field is considered adequate.

Conservation tillage minimizes soil disturbance and increases oxygen levels within the soil. It also reduces air pollution, limits soil compaction, and helps maintain a habitat for beneficial bugs and nutrients in the soil. By adopting conservation tillage, producers can lower fuel consumption and labor costs by decreasing material inputs and spending less on maintenance. Other benefits include improved weed suppression, increased percolation and infiltration, and decreased amount of evaporation of water from the soil surface.

How do I adopt crop residue management and conservation tillage? Irrigation producers may find it hard to adopt crop residue management and conservation tillage because to do so requires dedicated cultural changes. Producers with pressurized sprinkler irrigation systems may find the adoption less of a cultural shift than those who depend on gravity water delivery systems. With gravity irrigation systems, traditional tillage prepares the field for both planting crops and supplying irrigation water.

Adopting this practice is a learning process and may take several years to fully master. This best management practice will work best if crop residue management and conservation tillage are implemented in tandem. There are several factors that will affect this practice. For example, the equipment used, the tillage operation speed, and the crop type will determine how much residue may be left. Crop hybrid selection and variety traits are elements to consider because good germination potential under cooler conditions, early growth, vigorous root system, good stand under high populations, and high yields are better suited to this practice.

Farming with conservation tillage may require initial investments for new and specialized tilling accessories for field preparation. Producers should discuss options with peers who have successfully implemented this practice and who may be willing and able to lease their equipment or perform custom operations. The key to adopting the practice is to plan meticulously, start small, and experiment with trial runs before implementing it on a large scale.



Where can I find more information?

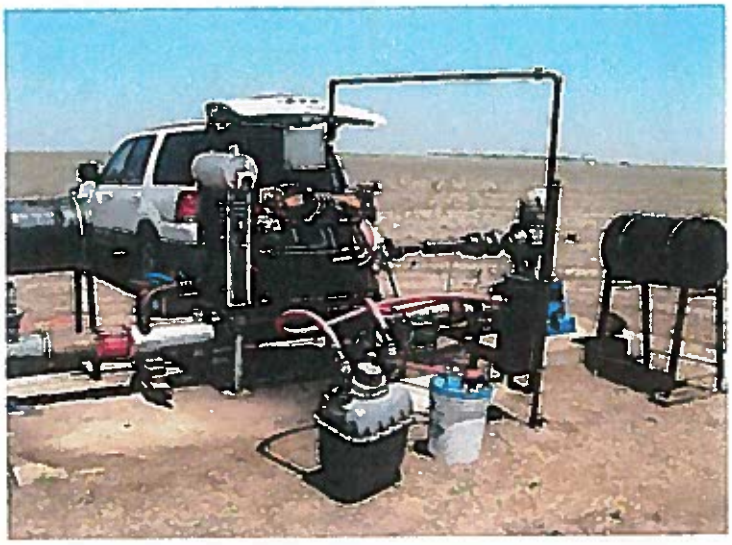
The best option for acquiring additional information on crop residue management and conservation tillage is your local office of the Natural Resources Conservation Service. Through its Environmental Quality Incentive Program, the Natural Resources Conservation Service offers a wide range of cost-share options. Texas AgriLife Extension and Texas AgriLife Research also provide ample opportunities for field tours of crop residue management and conservation tillage demonstrations around the state. Contact your local county agent or soil conservation specialist for information about training events in your area.

References

Lemunyon, J., and Gross, C., 2002, Conservation tillage and crop residue management: Natural Resources Conservation Service, 2 p. Available online at http://www.sera17.ext.vt.edu/Documents/BMP_tillage.pdf.

BMP 04: IRRIGATION AUDIT

An irrigation audit is the testing process to assess an irrigation system's performance. The Texas Water Conservation Implementation Task Force pointed out that this is the initial conservation practice producers should use to increase irrigation water efficiency. For gravity irrigation systems, the audit can assess on-farm water use, identify problems, and find ways to solve them. For pressurized sprinkler irrigation and micro-irrigation systems, the irrigation audit can provide more in-depth assessments. A complete analysis of the pressurized irrigation system is possible because all components of the irrigation system are generally located at one site. For example, an irrigation audit for a sprinkler irrigation system that has a pumping plant, well, and center pivot can assess the effectiveness of all component parts to determine the efficiency of the whole system. Generally, this practice is performed by experienced service providers, but it can also be conducted by the producers.



Why should I have an irrigation audit performed?

By auditing any irrigation system on a regular basis, producers can monitor the water use trend over a period of time. Because an irrigation audit provides critical information about an irrigation system's efficiency, it can be used to detect problem areas before they become endemic to the whole system.

An audit conducted for gravity irrigation systems can determine the time needed to distribute water adequately throughout the irrigated fields. Producers can also use the audit information to resize, reshape, and level the fields so that water can be delivered more rapidly and effectively.

An irrigation audit on pressurized systems can inform the producer how evenly irrigation water is being applied. This information is essential for producers to know when to replace key components such as sprinkler heads or emitters. The audit report will allow the producer to compare the original and current flow characteristics of the pumping plant and gauge the pumping plant's working condition. Information in the report may also be used to determine the mismatch of the system capacity with the flow characteristics of the pumping plant. Conducting irrigation audits on a regular basis helps the farmer schedule maintenance work for the well, pumping plant, and sprinkler heads or micro-irrigation emitters.

How do I conduct an irrigation audit?

A typical irrigation audit generally has three distinctive phases:

Phase 1— Data collection: The cooperation of the producer is paramount for meticulously collecting key information, which can include sketches or maps of fields, the locations of water supply networks, meters or measuring points, and inventories of pumping plants. Field information about crop types, field slope, soil types and textures, and infiltration rates is also important. The irrigation scheduling method, water use data from previous years, and copies of prior irrigation audits can also be important, in addition to well construction information and well testing records.

Phase 2— On-site audit: The on-site physical irrigation audit should verify water use in the fields by assessing the performance of the irrigation pumping plant while it is being used. For the gravity irrigation system audit, an orifice plate, flume, weir, propeller meter, soil moisture

be, level instrument, chain, or measuring tape may be needed. The of the trade for conducting an audit on pressurized irrigation systems may include a portable flow meter, stopwatch, pressure gauge, graduated measuring cylinder, soil sampling probe, and catch can.

Phase 3—Audit report: The data gathering and on-site audit phases should provide enough information to generate the audit report. This report may contain information on current equipment, recent irrigation schedules, and identified water uses throughout the operation. The irrigation audit report generally provides practical options for scheduling maintenance work to improve irrigation systems. More importantly, it also serves as a guidance tool for making innovative management changes.

Where can I find more information?

Some groundwater conservation districts provide the irrigation audit as a service. The local offices of the Natural Resources Conservation Service may cost share this practice as part of the irrigation system improvement programs under the Environmental Quality Incentive Program.

References

Natural Resources Conservation Service, 1997, National engineering handbook Part 652—Irrigation guide, 754 p. Available online at http://www.wsi.nrcs.usda.gov/products/w2q/downloads/Irrigation/National%20Irrigation%20Guide.pdf.

LOANS AND GRANTS

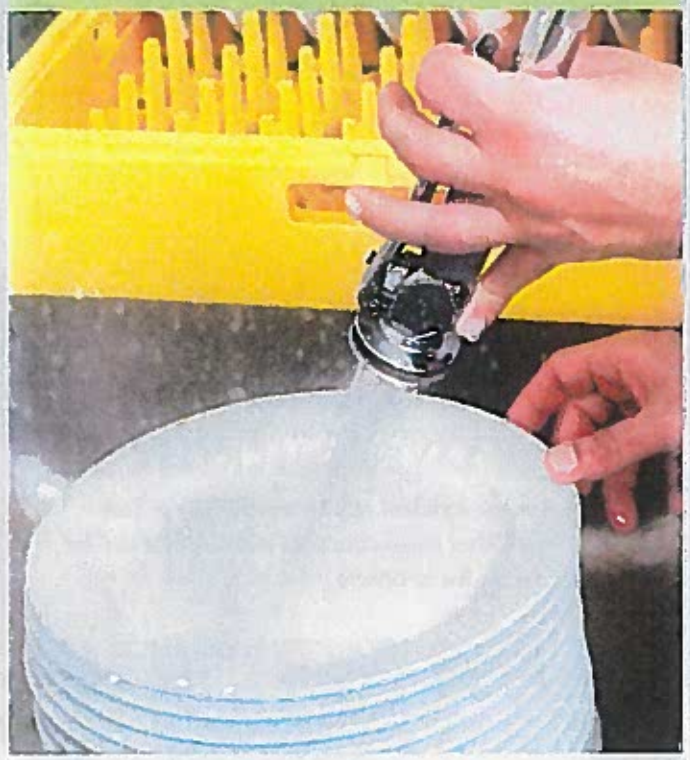
These irrigation water use management practices are eligible for funding under the Natural Resources Conservation Service incentive programs. TWDB-administered loan and grant programs may also support the adoption of these practices. Since the inception of the TWDB agricultural conservation program in 1985, over $50 million in loans has been provided to local institutions for improvements in irrigation systems. TWDB has also provided about $15 million in 313 grants to local districts and universities for promoting the adoption of agricultural irrigation water use practices. In addition, local districts implement water conservation best management practices by leveraging federal and state incentives and disseminating education to producers.

For further information on loan and grant opportunities, contact the TWDB Agricultural Conservation Team Lead at 512-463-7940, or visit the TWDB Web site: http://www.twdb.state.tx.us/assistance/conservation/agricons.asp

Texas Water Development Board
P.O. Box 13231, Capitol Station
Austin, Texas 78711-3231

Photo credits:
Cover, pages 7, 8, 9, 11, 12 (right): Aung Hla
Page 3: top and bottom, Harlingen Irrigation District, center, Tom Marek, Texas AgriLife Research
Page 4: Harlingen Irrigation District
Page 5: Tom Marek, Texas AgriLife Research
Page 6: Harlingen Irrigation District
Page 10: Nicholas Kenny, Texas AgriLife Extension
Page 12 (left): David Doerfert, Texas Tech University

WATER CONSERVATION FOR INDUSTRIES, BUSINESSES, AND INSTITUTIONS



USING WATER EFFICIENTLY makes good business sense. With rising costs of operations for many businesses, conserving water is one way to cut costs without compromising products or services. Texas' soaring population and dwindling water supplies have prompted communities to begin conservation programs, many of which provide financial incentives to businesses that establish water-saving practices.

Numerous businesses in Texas have already instituted significant conservation measures. As a result, they have reaped both financial and environmental benefits, demonstrating that water conservation can improve the bottom line.

EPA United States Environmental Protection Agency

Aquifer Recharge and Aquifer Storage and Recovery

On this page:

Aquifer recharge (AR) and aquifer storage and recovery (ASR) are manmade processes or natural processes enhanced by humans that convey water underground. The processes replenish ground water stored in aquifers for beneficial purposes. Although AR and ASR are often used interchangeably, they are separate processes with distinct objectives. AR is used solely to replenish water in aquifers. ASR is used to store water, which is later recovered for use.

Background

Projects for AR and ASR are increasing in number nationwide, especially in areas with potential for water shortages. AR and ASR projects are frequently found in areas of the United States that have high population density, proximity to intensive agriculture, dependence and increasing demand on ground water for drinking water and agriculture, and limited ground or surface water availability. Northeastern and midwestern states with relatively abundant water supplies may not have used AR and ASR widely. However, in many southeast, southwest, and western states, AR and ASR are popular options to provide a reliable water supply.

The objective of AR is to replenish water in an aquifer. Injecting water into AR wells can prevent salt water intrusion into freshwater aquifers and control land subsidence. In contrast, ASR wells are used to store water in the ground and recover the stored water for drinking water supplies, irrigation, industrial needs, or ecosystem restoration projects. The stored water may be recovered from the same well used for injection or from nearby injection or recovery wells.

Several methods of introducing water into an aquifer exist including:

- surface spreading
- infiltrations pits and basins
- injection wells

Injection wells are used for AR and ASR in areas where surface infiltration is impractical. EPA's UIC program regulates AR and ASR injection wells. The UIC program does not regulate the recovery of the stored water.

Construction of injection wells for AR and ASR varies depending upon site-specific conditions and project objectives. Wells may be either deep pits draining into porous layers above a USDW, or use multiple layers of casing and tubing to inject water directly into a USDW.

UIC regulations for AR and ASR wells

The regulating agency will either authorize the AR or ASR well by rule or by permit. The well is typically authorized by rule if both the owner or operator submits the well information and the well injection does not endanger a USDW. The regulating agency may require an individual permit if additional operating requirements are needed to ensure USDW protection.

Additional regulations adopted by primacy states for AR and ASR wells vary. State-specific AR and ASR regulations do not supersede federal regulations that prohibit USDW endangerment.

As of 2007, nine states require water used for AR and ASR injection be potable or treated to national or state standards. Potable water is defined differently in each state. Generally, "potable" refers to water of high quality posing no health risk when consumed.

Primacy states may adopt additional regulations for AR and ASR wells. However, state-specific AR and ASR regulations do not supersede federal regulations that prohibit USDW endangerment. Federal regulations state:

> "no owner or operator shall construct, operate, maintain, convert, plug, abandon, or conduct any other injection activity in a manner that allows the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR part 142 or may otherwise adversely affect the health of persons." (40 CFR 144.12L)

Impact on underground sources of drinking water

Water injected into AR and ASR wells includes:

- Drinking water from a public water treatment system
- Untreated ground water and surface water
- Treated effluent
- Reclaimed or recycled water

Some states allow additional types of water to be injected for AR and ASR. The water sources are subject to state regulations or state water criteria.

The type and quality of injected fluid, called "injectate," and the geology affect the potential for

endangering a USDW. The following examples illustrate potential concerns.

- Pathogens may enter aquifers if water is not disinfected prior to injection. Some states allow injection of raw water and treated effluent. In these states, the fate of microbes and viruses in an aquifer is relevant.
- Disinfection byproducts can form in the aquifer if water is disinfected prior to injection. Soluble organic carbon should be removed from the injectate before disinfection. If not, chlorinated disinfectants may react with the carbon to form contaminating compounds. Contaminants include trihalomethanes and haloacetic acids.
- Metals and radionuclides may be mobilized from the rock depending on the chemistries of the injected water and the aquifer. Differences in pH and reduction-oxidation potential between the injected water and aquifer may cause arsenic, iron, manganese, or radionuclides that are present in the rock to dissolve into the USDW.
- Carbonate precipitation in carbonate aquifers can clog wells when the injectate is not sufficiently acidic.

EPA is aware of some ASR operations that have exceeded the National Primary Drinking Water Regulations for arsenic and the National Secondary Drinking Water Regulations for iron and manganese. Additionally, the presence of disinfection byproducts has occurred in USDWs due to ASR activities.

AR and ASR injection can have positive impacts on USDWs. Recharge into aquifers of poor quality water has, in some cases, improved ambient water quality.

LAST UPDATED ON NOVEMBER 14, 2018

Water Supply Enhancement Program

Overview

Scarcity and competition for water have made sound water planning and management increasingly important. The demand for water in Texas is expected to increase by about 22%, to a demand of nearly 22M ac-ft in 2060; while existing water supplies are projected to decrease by about 10%, to just over 15M ac-ft. With Texas' population expected to grow by 82% in the next 50 years, the availability of water supplies is essential for not only the Texans of today but also for those of tomorrow (2012 State Water Plan, Texas Water Development Board).

Noxious brush, detrimental to water conservation, has invaded millions of acres of rangeland and riparian areas in Texas, reducing or eliminating stream flow and aquifer recharge through interception of rainfall and increased evapotranspiration. Brush control has the potential to enhance water yield, conserve water lost to evapotranspiration, recharge groundwater and aquifers, enhance spring and stream flows, improve soil health, restore native wildlife habitat by improving rangeland, improve livestock grazing distribution, protect water quality and reduce soil erosion, aid in wildfire suppression by reducing hazardous fuels, and manage invasive species.

Technical Resources

State Water Supply Enhanceme Plan (/sites/default/files/files/progr supply-enhancement/State%20WSE%20Plan%20Jan%202017_0.pdf)

Water Supply Enhancement Program Annual Report - 2017 (/sites/default/files/files/progr supply-enhancement/WSEP%202017%20Annual%20Report-2.pdf)

Water Supply Enhancement Program Fact Sheet (/sites/default/files/files/progr supply-enhancement/WSEP_FS_2016 2018.pdf)

Brush Control Feasibility Studies (http://www.tsswcb.texas.gov/a reports)

In order to help meet the State's critical water conservation needs and ensure availability of public water supplies, in 2011 the 82nd Texas Legislature established the Water Supply Enhancement Program (WSEP) administered by the TSSWCB, with the purpose of increasing available surface and ground water through the targeted control of brush species that are detrimental to water conservation (e.g., juniper, mesquite, saltcedar).

Contact

Water Supply Enhancement Program Office
(325) 481-0335

Program Reports

- Brush Management - Increasing Usable Water Supplies (/sites/default/files/files/programs/water-supply-enhancement/Brush%20Management%20-%20Increasing%20Usable%20Water%20Supplies.pdf)
- Effect of Brush Control on Evapotranspiration-North Concho River Watershed (/sites/default/files/files/programs/water-supply-enhancement/Effect%20of%20Brush%20Control%20on%20Evapotranspiration-North%20Concho%20River%20Watershed.pdf)
- Linkage of the Soil and Water Assessment Tool and the Texas Water Availability Model-Canyon Lake South-Central Texas 1995-2010 (/sites/default/files/files/programs/water-supply-enhancement/Linkage%20of%20the%20Soil%20and%20Water%20Assessment%20Tool%20and%20the%20Texas%20Water%20Availability%20Model-Canyon%20Lake%20South-Central%20Texas%201995-2010.pdf)
- Subwatershed Selection Criteria for Demonstration of Streamflow Yield Enhancement (/sites/default/files/files/programs/water-supply-enhancement/Subwatershed%20Selection%20Criteria%20for%20Demonstration%20of%20Streamflow%20Yield%20Enhancement.pdf)
- Brush Management in Gonzales County as a Water Management Strategy (/sites/default/files/files/programs/water-supply-enhancement/Brush%20Management%20in%20Gonzales%20County%20as%20a%20Water%20Management%20Strategy.pdf)
- Brush Management in Gonzales County as a Water Management Strategy Pt. 2 (/sites/default/files/files/programs/water-supply-enhancement/Brush%20Management%20in%20Gonzales%20County%20as%20a%20Water%20Management%20Strategy%202.pdf)

Partnering Agency Reports

Jump to a Section:

FY2018-2019 RFP Documents

The TSSWCB collaborates with SWCDs, and other local, regional, state, and federal agencies to identify watersheds across the state where it is feasible to implement brush control in order to enhance public water supplies. The TSSWCB uses a competitive grant process to rank

feasible projects and allocate WSEP grant funds, giving priority to projects that balance the most critical water conservation need of municipal water user groups with the highest projected water yield from brush control.

In watersheds where WSEP grant funds have been allocated, the TSSWCB works through SWCDs to deliver technical assistance to landowners in order to implement brush control activities for water supply enhancement. A 10-year resource management plan is developed for each property enrolled in the WSEP which describes the brush control activities to be implemented, follow-up treatment requirements, brush density to be maintained after treatment, and supporting practices to be implemented including livestock grazing management, wildlife habitat management, and erosion control measures (e.g., buffers, filter strips, reseeding). Cost-share assistance is provided through the WSEP to landowners implementing brush control activities on eligible acres.

Program Statute - Texas Agriculture Code, Chapter 203

In 1985, the 69th Texas Legislature created the Texas Brush Control Program (Senate Bill 1083) and designated the TSSWCB as the agency responsible for administering the Program. The goal of this legislation, which was authored by Senator Bill Sims of San Angelo, was to enhance the State's water resources through selective control of brush species. This statute was codified in Chapter 203 of the Texas Agriculture Code. The TSSWCB was given authority to delegate responsibility for administering certain portions of the Brush Control Program to local SWCDs.

In 1986, in accordance with Texas Agriculture Code §203.051, the TSSWCB first prepared and adopted a State Brush Control Plan, now known as the State Water Supply Enhancement Plan. The TSSWCB periodically revises the Plan and adopted the most recent revision in July 2014. The State Water Supply Enhancement Plan serves as the State's comprehensive strategy for managing brush in all areas of the state where brush is contributing to a substantial water conservation problem.

The Brush Control Program was unfunded until 1999, when the 76th Texas Legislature appropriated funds to implement the Brush Control Program. TSSWCB was appropriated funds for 12 fiscal years (2000-2011) to carry-out the Brush Control Program.

Texas Agriculture Code §203.056 requires the TSSWCB to submit an annual report on the activities of the Program to the Governor, the Speaker of the House, and the Lieutenant Governor before January 31 of each year.

Texas Agriculture Code, Chapter 203, Subchapter E, created a cost-share program for brush control, limited the cost-share rate to 70% of the total cost of a practice, and limited the cost-share program to critical areas designated by the TSSWCB and to methods of brush control approved by the TSSWCB. The Subchapter also established criteria for approving applications, setting priorities, and contracting for cost-sharing.

The Texas Sunset Advisory Commission conducted a review of the TSSWCB in 2009-2011. During this process the Sunset Commission adopted recommendations to address several issues identified with agency programs. As a result of the Sunset Commission's recommendations for improving the program, in 2011, the 82nd Texas Legislature passed House Bill 1808 which delineated major changes to TSSWCB's programs, including the elimination of the Texas Brush Control Program effective September 2011. House Bill 1808 established a new program for the agency, the WSEP, with the purpose of increasing available surface and ground water through the targeted control of brush species that are detrimental to water conservation.

Program Rules – Texas Administrative Code, Title 31, Chapter 517, Subchapter B

Texas Agriculture Code §203.012 authorizes the TSSWCB to adopt reasonable rules necessary to carry out the WSEP.

On March 22, 2012, the State Board adopted a comprehensive revision to 31 Texas Administrative Code, Chapter 517, Subchapter B, transitioning the rules from the Brush Control Program to the WSEP.

Further amendments to the rules were adopted by the State Board on July 28, 2014 to continue implementing provisions of House Bill 1808 and ensure consistency with the State Water Supply Enhancement Plan and other programmatic policies and documents.

State Water Supply Enhancement Plan

In accordance with Texas Agriculture Code §203.051, the TSSWCB must prepare and adopt the State Water Supply Enhancement Plan which serves as the State's comprehensive strategy for managing brush in all areas of the state where brush is contributing to a substantial water conservation problem.

The State Water Supply Enhancement Plan, formerly the State Brush Control Plan, was updated and revised in order to continue implementing provisions of House Bill 1808 passed by the 82nd Texas Legislature. In order to help meet the State's critical water conservation needs and ensure availability of public water supplies, the State Board adopted the current State Water Supply Enhancement Plan.

The State Water Supply Enhancement Plan also serves as the programmatic guidance for the TSSWCB's WSEP. The State Water Supply Enhancement Plan documents the goals, processes, and results the TSSWCB has established for the WSEP, including goals describing the intended use of a water supply enhanced by the WSEP and the populations that the WSEP will target. The State Water Supply Enhancement Plan discusses the competitive grant process, the proposal ranking criteria, factors that must be considered in a feasibility study, the geospatial analysis methodology for prioritizing acreage for brush control, how the agency will allocate funding, priority watersheds across the state for water supply enhancement and brush control, how success for the WSEP will be assessed and reported, and how overall water yield will be projected and tracked.

In prioritizing water supply enhancement projects for funding, the TSSWCB must consider the need for conservation of water resources within the territory of a proposed project, based on the State Water Plan as adopted by the Texas Water Development Board. The TSSWCB also considers whether or not a Regional Water Planning Group has identified brush control as a water management strategy in the State Water Plan.

The State Water Supply Enhancement Plan was last updated and approved by the State Board in January 2017.

Stakeholder Committee and Science Advisory Committee

In order to provide recommendations to the agency and guide the decisions of the State Board in implementing the Legislative directives for the WSEP (i.e., provisions of HB 1808, 82nd Legislature), the TSSWCB established a Stakeholder Committee of program

beneficiaries and a Science Advisory Committee of technical experts. Since early 2012, TSSWCB has worked with these two Committees to discuss how best to implement changes to the WSEP. Both Committees have worked hard to ensure that the best available science is being used by the TSSWCB to direct State funds to those areas where the positive impacts of brush management to enhance public water supplies can best be realized.

The Stakeholder Committee has provided recommendations for WSEP goals, the proposal ranking process, and the ranking index. The Stakeholder Committee is currently comprised of:

- **Association of Texas Soil and Water Conservation Districts - Jule Richmond**
- **Texas and Southwestern Cattle Raisers Association - Jason Skaggs**
- **Texas Commission on Environmental Quality - vacant**
- **Texas Tech University - Dr. Ken Rainwater**
- **Texas Water Development Board - Dr. Robert Mace**

The Science Advisory Committee has provided recommendations regarding requirements for feasibility studies and computer models, and the method for prioritizing acreage for brush control. The Science Advisory Committee is currently comprised of:

- **Texas A&M AgriLife Extension Service - vacant**
- **Texas Department of Agriculture - Dr. David Villarreal**
- **Texas Institute for Applied Environmental Research at Tarleton State University - Dr. Larry Hauck**
- **Texas Parks and Wildlife Department - Chad Norris (Anne Rogers, alternate)**
- **Texas Tech University - Dr. Ken Rainwater (Dr. Tom Arsuffi, alternate)**
- **Texas Water Development Board - Dr. Carla Guthrie (Dr. Yujuin Yang, alternate)**
- **USDA Agricultural Research Service - Dr. Mike White**
- **USDA Natural Resources Conservation Service - Dr. Ken Spaeth (Kristy Oates, alternate)**
- **U.S. Geological Survey - Dr. George Ozuna (Dr. Ryan Banta, alternate)**

Feasibility Studies and Project Watersheds for Brush Control

Since 1998, TSSWCB, in cooperation with many partnering entities, has been conducting assessments of the feasibility of conducting brush control for water supply enhancement in watersheds across Texas. These feasibility studies estimate the potential water yield enhanced through brush control. For a watershed to be considered eligible for allocation of WSEP cost-share funds, a feasibility study must demonstrate increases in projected post-treatment water yield as compared to the pre-treatment conditions.

Feasibility Studies conducted and published, and the reports accepted by the TSSWCB as established WSEP Project Watersheds, include:

- **Lake Alan Henry (impounds South Fork Double Mountain Fork Brazos River)**
- **Lake Arrowhead**
- **Lake Brownwood**
- **Upper Guadalupe River above Canyon Lake**
- **Gonzales County [Carrizo-Wilcox Aquifer Recharge Zone and Guadalupe River]**
- **Frio River above Choke Canyon Reservoir**
- **Nueces River above Lake Corpus Christi [above confluence Frio River]**
- **Edwards Aquifer Recharge Zone over**
  - **Frio River**
  - **Hondo Creek**
  - **Medina River**
  - **Upper Nueces River**
  - **Sabinal River**
  - **Seco Creek**
- **North Concho River [O.C. Fisher Lake]**
- **O.H. Ivie Reservoir (Lake Basin)**
- **O.H. Ivie Reservoir (Watershed) [Upper Colorado River and Concho River]**
- **Wichita River above Lake Kemp**
- **Canadian River above Lake Meredith**
- **Palo Pinto Reservoir**

- **Fort Phantom Hill Reservoir**
- **E.V. Spence Reservoir [Upper Colorado River]**
- **Lake J.B. Thomas [Upper Colorado River]**
- **Pedernales River [Lake Travis]**
- **Twin Buttes Reservoir [including Lake Nasworthy]**
- **Upper Llano River**

Feasibility Studies In Progress, being conducted either with TSSWCB WSEP funding or collaboratively funded by third-parties, include:

- **Victoria and Goliad Counties, including lower San Antonio and Guadalupe Rivers**
- **Wilson, Karnes, and Refugio Counties (third-party funding; San Antonio River Authority)**
- **Edwards Aquifer Recharge Zone over Upper Nueces River (carrizo cane specific) (third-party funding; Nueces River Authority and Edwards Aquifer Authority)**

The following are not feasibility studies, per se; rather, these studies, funded by TSSWCB, are critical to the WSEP and will contribute to the overall understanding of water supply enhancement through brush control:

- **Linking Empirical Data on Brush Management from Honey Creek State Natural Area to the Upper Guadalupe River Feasibility Study Model (U.S. Geological Survey)**
- **Effects of Huisache Removal on Evapotranspiration in South Central Texas at McFaddin Ranch in Victoria County (U.S. Geological Survey)**

Proposed Feasibility Studies to be considered in the future include:

- **Ballinger City Lake (saltcedar specific)**
- **Medina River over Edwards Aquifer Recharge Zone**
- **Carrizo-Wilcox Aquifer Recharge Zone in Burleson, Lee, Milam, and Williamson Counties**
- **Carrizo-Wilcox Aquifer Recharge Zone in Caldwell and Guadalupe Counties**
- **DeWitt County, including lower Guadalupe River and Lavaca River**
- **Hubbard Creek Reservoir (saltcedar specific)**

- **Stillhouse Hollow Reservoir (impounds Lampasas River)**
- **Upper Brazos River above Possum Kingdom Reservoir (saltcedar specific)**
- **Upper Blanco River over Edwards Aquifer Recharge Zone**
- **Upper Cibolo Creek over Edwards Aquifer Recharge Zone**
- **Lake Buchanan, including San Saba River, Brady Creek, and lower Pecan Bayou**
- **Lake LBJ, primarily Llano River below confluence of South and North Llano Rivers**
- **Lake Whitney, including Steele Creek**
- **White River Reservoir (saltcedar specific)**
- **Hill Country Priority Groundwater Management Area, Travis County portion only**
- **Mackenzie Reservoir**
- **Trinity Aquifer Recharge Zone in Hood, Montague, Parker, and Wise Counties**

Studies Completed for Fiscal Years 2002-2003
The feasibility of using brush control to enhance water yield was studied in the Lake Arrowhead, Lake Brownwood, Fort Phantom Hill Reservoir, and Palo Pinto Reservoir watersheds. The 77th Texas Legislature provided $500,000 to initiate these brush control feasibility studies in September 2001; they were completed in November 2002. The final report (TR-207) was delivered to the Texas Legislature in December 2002.

Studies Completed for Fiscal Years 2000-2001
In 1999, the Texas Legislature appropriated $1,000,000 to the TSSWCB to conduct eight brush control feasibility studies. The TSSWCB submitted these feasibility studies to the 77th Texas Legislature in January 2001. The Texas Agricultural Experiment Station and the USDA Natural Resources Conservation Service Water Resources Assessment Team performed modeling to determine water yields and used economic analysis to determine the feasibility of brush control projects in each watershed. The final report (TR-182) describes the results. Local river authorities and water districts provided information on historic land use and hydrology of each watershed and assessed changes in land use and hydrology due to brush infestation.

Studies Completed for Fiscal Years 1998-1999
In 1998, a year-long study was completed on the North Concho River watershed to determine potential water yield from a comprehensive brush control program throughout the watershed. The study was funded with a grant from the Texas Water Development Board and conducted by the TSSWCB, Texas Agricultural Experiment Station, and the Upper Colorado River Authority.

North Concho River Pilot Brush Control Project
Beginning in 1999, the Texas Legislature directed the TSSWCB to begin implementing the Texas Brush Control Program in the North Concho River watershed. This pilot brush control project was appropriated $16 million in fiscal years 2000-2003. Many of the changes implemented in the Program due to House Bill 1808 stem from lessons learned during the North Concho River pilot brush control project.

Program Policies

On May 15, 2014, the State Board approved a revised Policy on Allocation of Grant Funds for the WSEP. This policy was originally approved on March 6, 2013 and revised on July 18, 2013. This policy describes the agency's WSEP purpose and goals, the competitive grant process and proposal ranking criteria, factors that must be considered in a feasibility study, the geospatial analysis methodology for prioritizing acreage for brush control, and how the agency will allocate funding.

On May 15, 2014, the State Board approved a revised Policy on Brush Control Feasibility Studies for the WSEP. This policy was originally approved on July 18, 2013. This policy describes the requirements for computer modeling for water yield predictions in feasibility studies and the process to review applications for funding to conduct new feasibility studies.

On May 15, 2014, the State Board approved a Policy on Funding Technical Assistance for Brush Control through SWCDs for the WSEP (PDF, 38 kB). In order to maximize the effective and efficient use of WSEP grant funds, this policy describes the options SWCDs have for providing technical assistance to landowners and administering the cost-share program.

These three Policies were incorporated into the Program Rules (31 TAC Chapter 517, Subchapter B) and the State Water Supply Enhancement Plan.

FY2018-2019 Request for Proposals for Water Supply Enhancement Projects

The TSSWCB is requesting proposals for water supply enhancement projects seeking funding in FY2018-2019 to conduct brush control under the WSEP. Proposed projects should focus on watersheds with a demonstrated water conservation need and where brush control has been shown, using a computer model, to be a feasible strategy to enhance surface and/or ground water supplies. Proposals must be received by 5:00 p.m. CDT, Thursday, June 1, 2017, to be considered for funding.

Proposals may be submitted either electronically (preferred) or as hard copies. Submit proposals electronically to Johnny Oswald at joswald@tsswcb.texas.gov (mailto:joswald@tsswcb.texas.gov). Hard copy submissions should be mailed to the TSSWCB WSEP Office located at 622 South Oakes Street, Suite H-2, San Angelo, TX 76903. Regardless of delivery method, proposals must be received by 5:00 p.m. CDT, Thursday, June 1, 2017, to be considered for funding.

A competitive proposal review process will be used so that the most appropriate and effective projects are selected for funding. In January 2017, the TSSWCB adopted a revised State Water Supply Enhancement Plan, which describes the program purpose and goals, the competitive grant process and proposal ranking criteria, how the agency will allocate funding, and priority watersheds across the state for water supply enhancement and brush control.

Project proposals must relate to a water conservation need, based on information in the 2017 State Water Plan as adopted by the Texas Water Development Board. Project proposals will be evaluated giving priority to projects that balance the most critical water conservation need of municipal water user groups with the highest projected water yield from brush control. Evaluation criteria for proposed projects focus on municipal water supplies and those populations relying on the affected water supply.

WSEP funds will only be allocated to projects that have a published feasibility study that includes a watershed-specific computer-modeled water yield component developed by a person with expertise as described in Texas Agriculture Code §203.053(b). For a watershed to be considered eligible for cost-share funds, the feasibility study must demonstrate increases in post-treatment water yield as compared to the pre-treatment conditions.

The proposal submission packet includes the application for proposed water supply enhancement projects, a set of instructions that provides explanations of questions on the form and resources for answering those questions, and a set of guidelines that details project eligibility requirements and provides additional information critical for successful applications.

FY2018-2019 RFP Documents

- Proposal for Water Supply Enhancement Project Form (/sites/default/files/files/programs/water-supply-enhancement/WSEP_RFP_FY2018_application.pdf)
- Instructions for FY2018-2019 Proposal Form (/sites/default/files/files/programs/water-supply-enhancement/WSEP_RFP_FY2018_instructions.pdf)
- Guidelines for FY2018-2019 Proposals (/sites/default/files/files/programs/water-supply-enhancement/WSEP_RFP_FY2018_guidelines.pdf)
- Letter to SWCDs regarding FY2018-2019 Request for Proposals (/sites/default/files/files/programs/water-supply-enhancement/Oswald_memo_20170327.pdf)

"Protecting and Enhancing Natural Resources since 1939."

Texas State Soil and Water Conservation Board Headquarters

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WWW RWH Search

Search for Water Harvesting Systems

- Jal Swaraj
- Raincentre
- Happenings
- Events
- RWH Database

RESEARCH TOOLS

RUNOFF CALCULATOR
FAQ ON RWH
TECHNICAL HELPLINE
GROUNDWATER MAP
RAINFALL DATA
WATER LINKS
DOSSIERS
THREATENED WETLANDS
LEGISLATION
- NATIONAL
- INTERNATIONAL

HOW TO HARVEST
INDIA
- TRADITIONS
- RURAL CASE STUDIES
- URBAN CASE STUDIES

INTERNATIONAL
- TRADITIONS
- RURAL CASE STUDIES
- URBAN CASE STUDIES

We are launching a new site on Rainwater Harvesting and Lake Revival

CSE has been promoting the concept of water harvesting, particularly in urban areas, as a technological solution that can be adopted by all. CSE's campaign to promote water harvesting began with its in-depth research on India's rich traditions in using rainwater for a sustainable, participatory and equitable management of water. The research culminated in the book, Dying Wisdom: Rise, Fall and Potential of India's Traditional Water Harvesting Systems. CSE has compiled a database of NGOs and individuals knowledgeable about water harvesting across the country. In 2001, CSE published another book, Making Water Everybody's Business: Policy and Practice of Water Harvesting, which captures numerous case studies of village communities involved in water harvesting both in India and abroad.

For urban audiences CSE's programme to build model institutions shows people how rainwater harvesting is done. In order to create awareness among opinion and decision-makers, CSE provided them with easily understandable briefing papers that explained how policy options can be developed and implemented. CSE recently published a toolkit on urban rainwater harvesting, Catch Water Where It Falls - Toolkit on Urban Rainwater Harvesting. CSE also runs free consultancies for the communities and help them to plan and design rainwater harvesting.

Apart from this CSE is also working on wetland conservation campaign. Wetlands are vital sponges in the city. They prevent flood and recharge groundwater. Along with being an aesthetic entity, they provide social, economic and environmental beneficiaries. In the past CSE reported and brought together people who are concerned with the protection of these water bodies. CSE has been facilitating a forum where the lake protectors can come together to learn from each other. The organisation has created a database of these endangered waterbodies, collected information on how people are fighting for the restoration of these lakes in courts and is also bringing people together through meetings. CSE has also compiled successful case studies of lake revival across India.

NEW

View in a Larger map

Find Your Lake!
If you like us to add any further information about a lake/wetland, please contact **Amandeep Kang:** amandeep@cseindia.org.

Please come back to this page after few weeks for more updates

JAL SWARAJ CAMPAIGN

Papers

rainfall CSE's Work on Draft Legal Framework for Conservation and Protection of Inland Wetlands in South Asia

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Technical Advice

Catch Rainwater: Solve your water problems Technical advice for planning and designing rainwater harvesting

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Mining at deep sea

Countries are delving deeper into the ocean to explore its mineral wealth. The deposits on the ocean floor are enormous and the ecology of this largest habitat on earth, unexplored.
More...

TIGER TASK FORCE

Government appoints CSE director, Sunita Narain, chairperson of a five-member Task Force to review the management of Tiger Reserves in India

Terms of Reference>>

SIWI Stockholm Water Prize (2005) Awarded to CSE

Learn more>>

Network with CSEs Water Management Campaign

A campaign for participatory, equitable and decentralised paradigm for water management with the objective of making water everybody's business.
more>>

GRASSROOT INITITATIVES

The farmers of Ambaredi village boast of their lush green fields and full brim river even during the dry months of the year. Village Ambaredi in Jamkandorna taluka experienced a complete changeover from dry agricultural land to lush green fields only after 2000.

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Urban Water Supply
Demand for water is growing in most cities as every urban citizen requires almost double the amount of water that a rural citizen requires. Moreover, India is rapidly urbanising.

Urban population in India has grown almost five times in five decades from 1951 (62.44 million) to 2001 (286.08). Not long ago, most of our cities were self sufficient in meeting their water needs from the extensive urban water bodies to supply water to citizens. Today these water bodies have completely disappeared. Municipalities have been stretched to their limits to find water for the growing urban populations. Groundwater is being extracted by the government as well as the private parties.

View Delhi's history of development of water supply

Chennai-Excess Exploitation of Groundwater & Saline Intrusion

NEWS ALERT

The interceptor map

Action Alert: Delhi's interceptor sewer project
In the name of cleaning the river Yamuna, the Delhi government has recently cleared a Rs 1,950-crore project to lay sewers to intercept drains carrying sewage from colonies not connected to the city sewage system. But, will it clean the river at all? Or is it more money down the drain?

Read more

JOIN THE NATIONWIDE RAINWATER HARVESTING DATABASE

Counting the raindrops

CSE needs your help to create a nation-wide database of Urban Rainwater Harvesting structures and practitioners, which can be accessed by all online.
Please fill in this simple form to add your project to the database.

BEST RAINWATER HARVESTER'S AWARD

DJB announces Best rainwater harvester's award

In a bid to encourage the rainwater harvesters and acknowledge the efforts of those contributing to it, Delhi government announced the Chief Minister's "Best Rain Harvester" award. The award carries Rs. 2 lakhs and a citation in Category- I (Institutions and Housing Societies) while under category-II (Individuals) can get hold of Rs.1 lakh and a citation.

For more details see TOI dated [3.01.2006] or Click here>> [pdf]

DOWN TO EARTH

Water budget

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[Feb.28, 2006]

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EVENTS

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Seminar for teachers on Environment Education at Megpai, Faridabad
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WORLD WATER WEEK

PRESS RELEASE:
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WATER VIEWS

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Kanpur will have a Rs 412.44 crore Ganga drain by 2031
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Strait hit
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Water wrangle
States slug it out over rivers
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Lake assault
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ENVIRONMENT FOR CHILDREN

The cacophony over water
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WATER IN NEWS

MOEF releases draft of the National Environment Policy

India's second Raincentre comes up in Meerut

TECHNOLOGY

RWH techniques in the northeastern hill ranges

Sari to harvest rain!

Chauka Magic in central highlands

DOWNLOADS

National Environment Policy, 2004

Abridged version of *Pani Ghano Anmol*- findings of survey on water resources in Meerut

A guide map on hydro-geology of Chennai

Water profile of Thiruvananthapuram

Water profile of Kolkata

8) Addressing Desired Future Conditions (DFCs)

8.1 Management Objective:
At least once every three years, the District will monitor water levels and evaluate whether the change in water levels is in conformance with the DFCs adopted by the District. The District will estimate total annual groundwater production for each aquifer based on the water use reports, estimated exempted use, and other relevant information, and compare these production estimates to the MAGs listed in Table X.1.
8.1 Performance Standard:
1. At least once every three years, the general manager will report to the Board the measured water levels obtained from the monitoring wells within each Management Zone, the average measured drawdown for each Management Zone calculated from the measured water levels of the monitoring wells within the Management Zone, a comparison of the average measured drawdowns for each Management Zone with the DFCs for each Management Zone, and the District's progress in conforming with the DFCs.
2. At least once every three years, the general manager will report to the Board the total permitted production and the estimated total annual production for each aquifer and compare these amounts to the MAGs listed in Figure 5 for each aquifer that is declared by the district to be relevant.

To monitor DFC achievement, CBGCD understood the importance of establishing a monitor well network that not only represents a good geographical coverage of the district, but also represents all geologic formations of the Gulf Coast aquifer. In this effort, CBGCD employed Steve Young of Intera, Inc. to review our database of registered and permitted wells and suggest candidates for this network based on their location, total depth, and screening intervals.

The following chart shows the water level measurements taken from the established network. By taking a simple average of depth to water, the graph indicates a recovery since we began monitoring.

Precinct ID	Reg. #	Well Owner	Lat	Long	Formation	Depth	Mar-13	Mar-14	14-Nov	15-Mar	Nov-15
3-6	2009022401	Joe Freeman	29-10-18.8	96-18-42.9	Beaumont	95	44.5	45.1	45.6	44.2	43.4
4-1	2004120657	United Ag	29-3-25.6	96-12-33.9	Beaumont	49	14.4	14.5	15.9	14.7	15.3
2-5	2011122102	Gertson Farms Partnership	29-29-54.7	96-13-18.1	Upper & Lower Goliad	900	50.2	53	85.2	55.6	88
3-7	2005042701	Gaynard Wigginton	29-14-31.5	96-32-51.8	Upper & Lower Goliad	800	72.3	75.5	101.2	72.9	96.2
2-2	2005010649	Lower Colorado River Authority (T2)	29-29-23.4	96-16-5.5	Upper & Lower Goliad	924	53.7	49.4	93.5	57.1	68
2-6	2004070203	Roman Sliva	29-34-27.8	96-5-5.4	Beaumont	160	46	45.8	48.4	43.6	48.1
3-8	2008062311	El Campo Country Cl	29-14-4.4	96-18-34.1	Willis & Lissie	240	42	42.9	44.2	42.6	41.7
3-9	2004120768	Larry Russell	29-3-27.1	96-21-24.4	Upper & Lower Goliad	1000	45.5	46.7	53.2	46.4	50.7
3-10	2004101569	Arthur Priesmeyer	29-6-25.1	96-16-27	Willis & Lissie	850	69.8	70.4	75.3	68	74.7
4-5	2004090822	Tree Town USA 1/2 way	29-20-19.8	96-12-23.4	Willis & Lissie	386	67.6	66.9	70.5	56.3	65.8
3-11	2005010650	Herrmann Ranch	29-13-00	96-18-5.71	Upper & Lower Goliad	900	68.8	69.6	77.2	67.5	73.1
4-8	2004102609	South Texas land Limited Partnership1125	29-4-50.2	96-10-8.7	Upper & Lower Goliad	980	80.3	82.2	96.8	81.1	86.6
4-9	2005011103	Richard Knipling / Doris Wallace Herring Estate	29-1-36.6	96-16-8.9	Beaumont	649	55.6	57.6	66.5	56.8	56.6
4-10	2004061811	Rod Grass Farm LLC(Green)	29-11-57.5	96-13-40.2	Willis & Lissie	450	65.8	67.2	70.8	52.7	63.4
2-7	2004122195	Reynolds	29-25-59.4	96-17-37	Willis & Lissie	380	31.5	32.5	35.2	34.3	32.9
1-5	2005022111	kutach	29-19-41.4	95-57-54.3	Willis & Lissie	520	48.1	48.3	52.8	48.4	50.5
1 -6	2010042902	Enterprise	29-18-10.5	95-58-59.5	Upper & Lower Goliad	1130	68.2	70.9	76.2	68.8	73.1
2-8	2004093012	Bennettson	29-23-8.6	96-9-10.5	Willis & Lissie	225	35.6	36.7	47	35.3	44.9
AVERAGE							**57.01905**	**57.29524**	**68.333333**	**56.3**	**59.611111**

Precinct ID	Reg. #	Well Owner	Lat	Long	Formation	Depth	1-Mar-16	Mar-17	Nov-17	Mar-18	Nov-18
3-6	2009022401	Joe Freeman	29-10-18.8	96-18-42.9	Beaumont	95	42.5	42.2	43.1	41.8	41
4-1	2004120657	United Ag Gertson Farms	29-3-25.6	96-12-33.9	Beaumont Upper & Lower	49	14.5	14.5	14.5	14.2	14.1
2-5	2011122102	Partnership	29-29-54.7	96-13-18.1	Goliad Upper & Lower	900	52.3		58.3	52.1	60.3
3-7	2005042701	Gaynard Wigginton	29-14-31.5	96-32-51.8	Goliad	800	68.5	69.7	95.2	67.9	96.6
2-2	2005010649	(T2)	29-29-23.4	96-16-5.5	Goliad	924	54.7		59.1	50	60.5
2-6	2004070203	Roman Sliva	29-34-27.8	96-5-5.4	Beaumont	160	42.9	42.9	44.8	42.1	41.8
3-8	2008062311	El Campo Country Cl	29-14-4.4	96-18-34.1	Willis & Lissie	240	40.7	39.2	39.5	38.8	38.4
3-9	2004120768	Larry Russell	29-3-27.1	96-21-24.4	Goliad	1000	45.3	45.4	49.7	43.7	46.2
3-10	2004101569	Arthur Priesmeyer Tree Town USA 1/2	29-6-25.1	96-16-27	Willis & Lissie	850	66	56.6	73.2	56.8	70.2
4-5	2004090822	way	29-20-19.8	96-12-23.4	Willis & Lissie Upper & Lower	386	53.7	56.2	59.4	54.4	58.2
3-11	2005010650	Herrmann Ranch South Texas land	29-13-00	96-18-5.71	Goliad Upper & Lower	900	66.1	65.6	70	65.5	66.1
4-7	2004102602	Limited Partnership South Texas land	29-5-21.7	29-11-14	Goliad Upper & Lower	812					
4-8	2004102609	Limited Richard Knipling / Doris Wallace	29-4-50.2	96-10-8.7	Goliad	980	74.9	75.2	82.1	73.8	84
4-9	2005011103	Herring Estate Rod Grass Farm	29-1-36.6	96-16-8.9	Beaumont	649	50.1	56.2	58.3	51.7	53.8
4-10	2004061811	LLC(Green)	29-11-57.5	96-13-40.2	Willis & Lissie	450	57.8	56.8	60.1	48.5	55.4
2-7	2004122195	Reynolds	29-25-59.4	96-17-37	Willis & Lissie	380	31.3	29.4	27.6	17.9	25.2
1-5	2005022111	kutach	29-19-41.4	95-57-54.3	Willis & Lissie Upper & Lower	520	46.8	47.2	48.5	44.9	45.8
1 -6	2010042902	Enterprise	29-18-10.5	95-58-59.5	Goliad	1130	69.6	68.5	71.5	67.6	69.6
2-8	2004093012	Bennettson	29-23-8.6	96-9-10.5	Willis & Lissie	225	34.2	35.6	37.8	33.9	36.6
AVERAGE							**50.66111**	**50.075**	**55.15**	**48.08889**	**53.544444**

3/1/2013	3/1/2014	11/1/2014	3/1/2015	11/1/2015	3/1/2016	11/1/2016	3/1/2017	11/1/2017	3/1/2018	11/1/2018
57.02	57.3	68.33	56.3	59.61	50.66	56.24	50.075	55.15	48.08	53.5