

Appendix A

Caldwell County Stakeholder Sign-In Sheets

		Ω.	olgn in oneer		
Group	Here	Contact	Address	City	Email
Texas State Soil &		Pam Casebolt	P. O. Box 658	Temple, Texas 76503-	awendt@tsswcb.state.tx.us
Water Conservation Board	7	Alaxon Wandt		0628	plasebolt@tssweb.
Tri-Community Water Supply Corporation		Tommy Forester	92 Ward Street	Fentress, Texas 78622	tri-commwater@hwtx.com
Turner Crest	E	Bob Richards	100 E. San Antonio St., Suite 103A	San Marcos, Texas 78666	brichards@ccias.com
Creedmoor- Maha WSC		Charles Laws	12100 Laws	Buda, TX 78610-9607	
Luling Independent School District		Mark Weisner	212 E. Bowie	Luling, TX 78648	
San Marcos Consolidated Independent School District		Dr. Patty Shafer	P.O. Box 1087	San Marcos, TX 78667	

		ndb.					
	Email	mnelsou@fudb. State.to.us					
	City	Austin, Texas 78711-3231	San Marcos, Texas 78666	Seguin, Texas 78155	Gonzales, Texas 78629	Bastrop, TX 78602	Lockhart, TX 78644
olgn in oneer	Address	P.O. Box 13231	111 E. San Antonio, Suite 300	307 W. Court Street	414 St. Joseph St., Suite 200	650 Hwy 21E	191 6 W. San Antonio St.
Ž	Contact	Matt Nelson	Liz Sumter, County Judge	Mike Wiggins, County Judge	David Bird, County Judge	Tommy Frizzell	Joyce Buckner
	Here	7					
	Group	Texas Water Development Board	Hays County	Guadalupe County	Gonzales County	Bluebonnet Electric	Bluebonnet Electric

		Z.	orgin in oneer		
Group	Here	Contact	Address	City	Email
County Line Water	\	Daniel Heideman	##	**************************************	heideman@clws.com
Supply Corporation	7		Road 1315 Camino Reach	whland	512-398-4748
Crystal Clear Water		Mark Speed	2370 FM 1979	San Marcos, Texas	mark@crystalclearwsc.com
Supply Corporation	7			78666	
Envision Central Texas		Jim Walker	P.O. Box 17848	Austin, Texas 78760-7848	info@envisioncentraltexas.org
Envision Central Texas	>	Sally Campbell, Executive Director	P.O. Box 17848	Austin, Texas 78760-7848	info@envisioncentraltexas.org
Gary Job Corp		Bob Elsey	P.O.Box 967	San Marcos, Texas 78666	elsey.bob@jobcorp.com
GoForth Water Supply Corporation		Mario Tobias	8900 Niederwald Strasse	Kyle, Texas 78640	mario@goforthwater.org
Gonzales County Water Supply Corporation		Barry Willer	1903 E. Sarah DeWitt Drive	Gonzales, Texas 78629	
Lockhart Independent School District		Dr. Jose Parra	P.O.Box 120	Lockhart, Texas 78644	

		.	Sign in Sheet		
Group	Here	Contact	Address	7	Email/Phone no.
Aqua Water Supply Corporation		John Burke	P.O. Box P	Bastrop, Texas 78602	Jburkeoaquamsc.c
Caldwell County	7	H. T. Wright	110 S. Main St.	Lockhart, Texas 78644	htwright@lockharttx.net or marie.cavanagh@co.caldwell.tx. us
Canyon Regional Water Authority	7	David Davenport	850 Lakeside Pass	New Braunfels, Texas 78130	crwa@crwa.com
City of Lockhart		James Bertram	P.O. Box 239	Lockhart, Texas 78644	jbertram@lockhart-tx.org
City of Lockhart	7	Vance Rogers	P. O. Box 239	Lockhart, Texas 78644	vrodgers@lockhart-tx.org
City of Luling		Bobby Berger	509 E. Crockett	Luling, Texas 78648	
City of Luling		Mike Hendricks	509 E. Crockett	Luling, Texas 78648	mhendricks5@austin.rr.com
City of Martindale		Patricia Petersen	P. O. Box 365	Martindale, Texas 78655	bethh@martindaletexas.org

Group	Here	Contact	Address	City	Email
Prairie Lea Independent School District		Mr. Jesse Lopez	6910 San Marcos Hwy	Prairie Lea, TX 78661	
Edwards Aquifer Authority	>	Mr. Mark Taylor, Board Member – District 11	4615 N.St. Mary's Street 130 E Siem Circle	San Antonio, TX- 78215 San Marcos TX 18666	markbtaylor@grandecom.net
Hays Caldwell Public Utility Agency	>	Graham Moore	400 West Hopkins, Suite 203	San Marcos, TX 78666	gmmoore@lan-inc.com
Gonzales County Groundwater Conservation District	>	Greg Sengelmann	P.O.Box 1919	Gonzales, Texas 78629	gcumeda gvec.net
Caldwell County Environmental Enforcement		Robert Hall	405 E. Market Street	Lockhart, Texas 78644	
Oscar Fogle		GBRA Director	3146 Westwood Road	Lockhart, Texas 78644	oscar@fogle.org

Kick-off Meeting - September 25, 2008 Sign in Sheet

		ינ <u>ב</u>	Dign in Dave		
Group	Here	Contact	Address	Cify	Email
Luling Foundation Farm	1	Mike Kuck	523 S. Mulberry	Luling, Texas 78648	lffmanager@sbcglobal.net
Maxwell Water Supply Corporation		Mike Hurlbert	P.O.Box 158	Maxwell, Texas 78656	
Plum Creek Conservation District	7 7	Johnie Halliburton Paniel Meyer	1403 Blackjack Street, Suite 3	Lockhart, Texas 78644	pccdjohnie@austin.m.compcco.org info@ptcd.org
Plum Creek Watershed Partnership		Nikki Dictson	355A Heep Center 2474 TAMU	College Station, Texas 77843-2474	n-dictson@tamu.edu
Polonia Water Supply Corporation	7 7	Paul Pittman Joe Kelly	P. O. Box 778	Lockhart, Texas 78644	paulp@ctxu.net
San Marcos River Foundation		Dianne Wassenich	11 Tanglewood St.	San Marcos, Texas 78666	wassenich@sanmarcos.net
South Central Texas Water Planning Group		Con Mims	Nueces River Authority P.O.Box 349	Uvalde, Texas 78802	
Texas Commission on Environmental Quality Region 11		Claudia Chaffin	2800 South IH 35, Suite 100	Austin, Texas 78704	cchaffin@tceq.state.tx.us

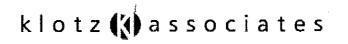
Austin Pittman, Pres. of Board, Polonia WSe 502 Old Lytton Springs Rd.

398-2857

Griselda Gonzales
7550 14 10 West suite 300
6. A. TX
(210) 736-0425
griselda. genzales@klotz.com

Alan Thompson Klotz Associates alan. thompson@Klotz.com

Pamela Hohman Eastern Caldwell Co Landowners Banelahohman@ gmail.com 836 540 3727



SIGN IN SHEET

Please verify information and check next to name. Please add a contact phone number where you can be reached. Add contact information if not listed. Thank you.

f not listed. Thank you.					
Organization	Address/Phone#	Attendees	- [XV]	Emalls - Emalls	
exas State Soil & Water	PO Box 658	Pam Casebolt		pcasebolt@tsswcb.state.tx.us	
Conservation Board	Temple, Texas 76503-0658	Aaron Wendt		awendt@tsswcb.state.tx.us	
Texas Water Development Board	PO BOX 13231 Austin, Tx 78711-3231	Matt Nelson		mnelson@twdb.state.tx.us	
	650 Hwy 21E	Tommy Frizzell			
Bluebonnet Electric	Bastrop, Tx.78602				
Bluebonnet Electric	1916 W San Antonio St. Lockhart Tx, 78644	Joyce Buckner	/	joyce buckner a bluebo	nnet
County Line Water Supply Coorporation	131 Camino Real Uhland, Texas 78640	Daniel Heideman 5/2 - 738 - 2073	V	heidman@clws.com	
Crystal Clear Water Supply corporation	2370 FM 1979 San Marcos, Texas 78666	Mark Speed	V		
Envision Central Texas	PO Box 17848 Austin, Texas 78760-7848	Sally Campbell		info@envisioncentraltexas.org Scampbell@envision centraltexas.ong	
Aqua Water Supply Corporation	PO Box P Bastrop, Tx 78602	John Burke			
Caldwell County	110 S Main St Lockhart Tx, 78644	Tom BONN	₩/	htwright@lockharttx.net tbonn 71 @gimail.c	ЮM
Canyon Regional Water Authority	850 Lakeside Pass New Brausfels, Texas 78130	David Davenport Crais Hines		chines@grecinet	
City of Lockhart	PO Box 239 Lockhart Tx, 78644	Vance Rogers		vrodgers@lockhart-tx.org	
Edwards Aquifer Authority	130 E Sierra Circle San Marcos, Texas 78666	Mark Taylor	V	markbtaylor@grandecom.net	
Hays Caldwell Public Utility Agency	400 West Hopskins, Ste 203 San Marcos, Texas 78666	Graham Moore		gmmoore@lan-inc.com	
Gonzales County Graoundwater Conservation District	PO Box 1919 Gonzales, Texas 78629	Greg Sengelmann		gcuwcd@gvec.net	
GBRA	3146 Westwood Road Lockhart Tx, 78644	Oscar Fogle, GBRA Director		oscar@fogle.org	
GBRA	3146 Westwood Road Lockhart Tx, 78644	Bill West Debbie Magin		gm@gbra.org dmagin@gbra.org	
Luling Foundation	523 Mulberry Luling, Texas 78648	Mike Kuck		lffmanager@sbcglobal.net	
	1403 Blackjack St, Ste B	Johnie Halliburton		johnie@pccd.org	1
lum Creek Conservation	Lockhart Tx, 78644	Daniel Meyer	- h	info@pccd.org	i
District	200Midit 17, 10077	Sanior moyor			1

	Ino n ===	In the	1, 7	To the order of	1
Polonia Water	PO Box 778	Paul Pitman	1	paulp@ctxu.net	
Polonia Water SupplyCorporation	Lockhart Tx, 78644	Joe Kelly	\vdash	·	
		Austin Pittman, Board President			
Eastern Caldwell County		Pamela Hobman		pamelahohman@gmail.com	
Landowner			_		
	7550 IH-10 West, Ste 300	Alan Thompson, PE	 	alan.thompson@klotz.com	
Klotz Associates Inc.	San Antonio, Texas 78229	Griselda Gonzales		griselda.gonzales@klotz.xom	
	210-736-0425				
MARTINDALE	PO. BOX 365	PATRICIA PETERSEN		epHemeral@austin.1700	p)
MARINUALE	MARTINOPLE TX 78655	MAYOR	-		
*		Vacca I see	1	jesus.lopez o prairiele	بعرما في الم
Prairie Lea Ist	6910 San Marios Hu	Jesse Lapez Superntendent	1	Jesus. 18 pec to prairie	eq. value
	Prairie Lea TK 78661				
Lockhart ISD	P.O. Box 120	Jose Parra, Supt,		jose.pawa@lokhan	tre
	Lockhast, TY78644	Ed Sheppand, Principal	 	el. skepade lokhall publicuor KSB citgoflu	tral
City of	509 E. Crockett			Dublicworks & Citable	ling. n
	Luling, Tx. 78648	Chris Powell	-		7
Luling		e l'a l'autor	├	mil de pl	100
Maha	12100 Lews Pd.	Gen. Manager	╂┈	Charles Plans, not	,000
WS C	Mustry Kilming 18410	Sey, Mendy 6			
Plum Creek	2474 TAMBLE	Mikki Dictson	V	ndictson@ag.tamu.	edu
Watershed Partnersh	Collegestation, Tx	<u> </u>		<u> </u>	
Watershed Partnership	1110 5431 7		<u> </u>		
CITYOFSAN	630 E. HOPKINS	Tom TAGGART	╀	ci, san-marcos, tz.	L. <u>.</u>
marcos/ HCPVA	SAN MARCOS, TX		+	CU.SAN-MARCOS, CZ.	52.
GONZAles Co.	PO Box 149	Barry Miller		bmiller equeci	ver
WSC.	GONZULOS, TX	7		7	
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Appendix B

Caldwell County Regional Water and Wastewater Planning Study Utility Survey

Utility Survey

Caldwell County Water and Wastewater Planning Study Survey

Utility Name		
Interview Com	ıpleted By	
Date		_
Do you supply	☐ Potable Water Service	☐ Wastewater Collection and Treatment
	w or statue was utility	
General Info	ormation — Please consider o	nly services to Caldwell County
		<u> </u>
	sources of water (please check al	i tnat apply): ed annual volume:
□ Grour	ndwater – purchased from others :	- permitted annual volume:
□ Surfa	ce Water – own water rights/self	treat – maximum annual volume:
		elf treat – maximum annual volume:
		n others - maximum annual volume:
□ Other	r (describe):	
Please List Cer	rtificates of Convenience and Nece	ssity (CCN) that your utility holds for water.
<u>Number</u>	Date Granted	
		_

For Calendar Year	2008, what was your a	verage daily water de	elivery?	_mgd
	ric peak day volume foi (month, day,		mgd that oc	curred
Please provide the	following water use da	ata:		
<u>Calendar Year</u>	Volume of Water Pu	mped into System	Volume of Water Bill	<u>ed</u>
2008		Million Gallons	Million	Gallons
2007		Million Gallons	Million	Gallons
2006		Million Gallons	Million	Gallons
2005		Million Gallons	Million	Gallons
2004		Million Gallons	Million	Gallons
Please provide the	following customer da	ta:		
<u>Calendar Year</u>	Residential Meters	Commercial/	Other Meters	
January 1, 2009		Industrial Meters		
January 1, 2008				
January 1, 2007				
January 1, 2006				
January 1 2005				

Your Future Projections (based on your planning):

<u>Calendar Year</u>	Residential Meters	Commercial/ Industrial Meters	Other Meters
January 1, 2010			
January 1, 2011			
January 1, 2014			
January 1, 2019			
January 1, 2039			
Please Describe You <u>Name</u>	r Water Production Fa		ed Capacity, mgd

Population Information — Please consider only population in Caldwell County

Based on the information you have available, can you estimate:

<u>Calendar Year</u>	Estimated Population in	your service area in Caldwell County
January 1, 2009		
January 1, 2008		
January 1, 2007		
January 1, 2006		
January 1, 2005		
Future Projection	ns (based on your planning):	
Calendar Year	Estimated Population in	your service area in Caldwell County
January 1, 2010		
January 1, 2011		
January 1, 2014		
January 1, 2019		
January 1, 2039		
Please list your to	op five water users (in annua	al volume of water consumed):
1		million gallons/year
2.		million gallons/year
3		million gallons/year
4		million gallons/year
5		million gallons/year
Please list any NI	DEPS permits you hold for yo	our water production facilities:
<u>Number</u>	Date Granted	Permitted Volume
	_	million gallons/year

million gallons/year
million gallons/year
million gallons/year
Water Ovelity
Water Quality
Please describe any quality issues or concerns you have experienced with your source water
Do you have any recurring potable water quality issues that are related to your source water?
Describe any concerns you may have regarding point source discharges and non-point source pollution that occurs in Caldwell County that may impact water quality.
Water Conservation
What measures have you implemented to encourage water conservation?

What future m	leasures are being considered to encourage water conservation?
My utility has	a state approved drought contingency plan.
Plans for the	e Future
	e any plans (available options) that will be considered or implemented to
Please describ	e any planned additions, changes, and/or upgrades for water production
Wastewater	· Services
If you are was Own Own Own	tewater service provider, how do you operate? (Please check all that apply) and operate wastewater collection system and operate wastewater treatment plant wastewater treatment operated by others (describe):
Please List Cei wastewater.	tificates of Convenience and Necessity (CCN) that your utility holds for
<u>Number</u>	Date Granted
	_
For Calcuda: Y	
	'ear 2008, what was your average daily wastewater flow treated (if multiple break out by plant)?

	ic peak day volume for		eatment?	mgd
Please provide the	following water use da	ıta:		
<u>Calendar Year</u>	Volume of Wastewa	ter Treated	Volume of Water Bi	lled
2008	Mill	ion Gallons	Millio	n Gallons
2007	Mill	ion Gallons	Millio	n Gallons
2006	Mill	ion Gallons	Millio	n Gallons
2005	Mill	ion Gallons	Millio	n Gallons
2004	Mill	ion Gallons	Millio	n Gallons
Please provide the	following data regardi	ng sewer connections:	:	
<u>Calendar Year</u>	Residential Sewer	Commercial/ Industrial Sewer	Other Sewer	
January 1, 2009				
January 1, 2008		-		
January 1, 2007				
January 1, 2006				
January 1, 2005				
What are your futur	re projections for sewe	er connections? (Based	d on your planning)	
<u>Calendar Year</u>	Residential Sewer	Commercial/ Industrial Sewer	Other Sewer	
January 1, 2010				
January 1, 2011				
January 1, 2014				
January 1, 2019				
January 1, 2039				

Please Describe Your Wastewater Treatment Facilities:

<u>Name</u>	Type of Treatment Plant	Rated Capacity, mgd
		
	<u></u>	

Please list your t	op five wastewater producers	s (in annual volume of wastewater):
1.		million gallons/year
2.		million gallons/year
3.		million gallons/year
4.		million gallons/year
5		million gallons/year
Please list any N	DEPS Permits you hold for you	ur wastewater treatment facilities:
Number	Date Granted	Permitted Volume
	_	million gallons/year
		million gallons/year
		million gallons/year
		million gallons/year
D		vou bour aloue to do co2
Do you re-use tro	eated wastewater and/or do y	ou nave plans to do so?
	any wastewater treatment pla to support future growth?	ns (available options) that will be considered

Please describe any planned additions, changes, and/or upgrades for wastewater treatment facilities.
Other
Other
Please provide any other comments pertinent to the study:



Appendix C

Water Quality Standards

APPENDIX C

The following tables are found in 30 TAC 290 Subchapter F: Drinking Water Standards. Refer to this section of the Texas Administrative Code (TAC) for further details on drinking water standards.

Secondary Constituents

Summary of Secondary Standards												
CONTAMINANT	LEVEL (mg/l except where otherwise stated)											
Chloride	300											
Flouride	2.0											
Iron	0.3											
Manganese	0.05											
Sulfate	300											
Total Dissolved Solids	1,000											

Inorganic Contaminants

Inorganic Contaminants												
CONTAMINANT	MCL (mg/l)											
Nitrate	10 (as Nitrogen)											
Nitrate	1 (as Nitrogen)											
Nitrate & Nitrate (Total)	10 (as Nitrogen)											



Appendix D

TWDB Groundwater Quality Report



Texas Water Development Board Groundwater Database Reports



Water Quality Publication Report County: Caldwell

State Well Number	Aquifer	Depth	Date	B/U	pН	Silica	Calcium	Magnesium	Sodium	Potassium	Carbonate	Bicarb.	Sulfate	Chloride	Fluoride	Nitrate	Dissolved Solids	Spec. Cond umhos	Hardness as CaCO3	% Sodium	SAR	RSC
5860703																						
	124WLCX	49	2 / 27/ 1	946 U							0	65.9	28	41		62						
5860704																						
5860705	124WLCX	18	2 / 27/ 1	946 B	7.2	35	46	6.7	36	4.6	0	152.54	20	51	0.2	9.8	284	470	142	35	1.29	0
3800703	124WLCX	44	6 / 11/ 1	946 II							0	84	13	102		41						
5860706											-											
	124WLCX	26	6 / 11/ 1	946 U							0	328	16	84		2.2						
5860707																						
	124WLCX	150	1 / 9 / 1	964 B	7.6	16	24	7.8	c 150		0	334.09	37	74	0.6	0	473	795	92	78	6.77	3.64
5860709	124WI CV	100	7 / 10/ 1	077 D	7.6	29	50.6	0.07	102		0	210.66	44	115	0.2	2.4	162	946	167	57	2.45	0.25
6702503	124WLCX	160	7 / 19/ 1	911 D	7.6	29	50.6	9.97	103		Ü	219.66	44	115	0.3	2.4	462	846	167	37	3.45	0.25
0702303	110AVML	29	6 / 13/ 1	946 U							0	270	16	16		30						
6702507																						
	110AVML	21	6 / 12/ 1	946 U							7.9	230	20	16		41						
6702601																						
6702602	110AVML	19	6 / 12/ 1	946 U							12	202	32	26		34						
0702002	110AVML	21	6 / 12/ 1	946 II							9.8	144	13	28		60						
6702603	TIOTIVINE	21	0 / 12/ 1	J40 C							7.0	144	15	20		00						
	110AVML	35	6 / 13/ 1	946 U							11	231	25	27		55						
6702702																						
	100ALVM	27	2 / 26/ 1	968 B	7.3	19	98	7	30		0	339.26	20	22	0.3	7	370	680	273	19	0.79	0.09
6702703	100 4 1 3/3/4	21	2 / 26/ 1	060 B	7.0	20	130.2	0.5	57.3		0	345.36	50	55	0.4	72	571	1038	359	25	1.3	0
6702704	100ALVM	31	2 / 26/ 1	906 D	7.2	20	150.2	8.5	31.3		Ü	343.30	58	55	0.4	72	3/1	1038	339	23	1.5	0
	110AVML	31	3 / 28/ 1	946 U							0	294	65	71		59						
6702705																						
	110AVML	22	3 / 28/ 1	946 U							0	286	34	64		47						
6702706																						
6702707	110AVML	25	3 / 28/ 1	.946 U							0	356	65	141		176						
0/02/0/	100ALVM	26	2 / 26/ 1	968 B	7.3	18	106.4	7.66	27.8		0	356.34	27	18	0.5	13	393	716	297	16	0.71	0
6702708		20	_ , _ 20, 1	2	,		100.4	7.00	20		Ŭ	220.27	2.		0.0		2,2	, 10	27,	••	0.71	Ü
	100ALVM	29	2 / 28/ 1	968 B	7.1	18	201	21	180		0	339.26	211	334	0.5	16.5	1148	2272	587	39	3.23	0
6702801																						

^{*} Depth value here reflects the bottom of the SAMPLED INTERVAL which was different from the completed well depth

State Well Number	Aquifer	Depth	Date	B/U	pН	Silica	Calcium	Magnesium	Sodium	Potassium	Carbonate	Bicarb.	Sulfate	Chloride	Fluoride	Nitrate	Dissolved Solids	Spec. Cond umhos	Hardness as CaCO3	% Sodium	SAR	RSC
	100ALVM	22	2 / 14/	946 B			122	5.1	c 38		0	268.07	40	81		40	457	891	325	20	0.92	0
6702902																						
	112LEON	25	3 / 28/	946 U							0	264	110	358		58						
6702905																						
	112LEON	24	3 / 29/	946 U							0	248	65	239		38						
6702908																						
	112LEON	20	7 / 18/	976 B	7.2	17	133.6	5.5	44.4		0	405.15	35	57	0.4	5.8	497	924	356	21	1.02	0
6703301																						
	124WLCX		6 / 11/								0	340	1150	1240								
	124WLCX	20	7 / 19/	977 B	7.8	24	514	215	660		0	817.63	1788	808	1.5	1.3	4413	8344	2167	39	6.17	0
6703303																						
	124WLCX	67	6 / 11/	1946 U							0	298	24	54		0						
6703304			2 / 25/									22.5	0.5	# 40								
	124WLCX	72	2 / 27/	1946 U							0	336	85	560		1.5						
6703401	1104777		6 / 10/	0.46 TT							0	200		22		25						
6703402	110AVML	14	6 / 12/	1946 U							0	308	65	32		25						
0703402	110AVML	20	6 / 12/	046 11							0	284	54	70		33						
6703601	110A V MIL	30	0 / 12/	1946 U							U	264	34	70		33						
0703001	124WLCX	40	4 / 12/	046 11							0	412	80	94		0.5						
6703602	124W LCA	49	4 / 12/	1940 0							U	412	80	24		0.5						
0703002	124WLCX	35	6 / 11/	946 U							0	340	765	148								
6703603																						
	124WLCX	26	6 / 11/	946 U							0	338	430	800								
6703703																						
	112LEON	29	1 / 24/	946 U							0	326	46	22		26						
6703704																						
	218EDRDA	3367	2 / 20/	964 B	6.9	17	894	433	c 2480		0	547.15	2130	4770			10993	15800	4012	57	17.03	0
6703705																						
	112LEON	23	1 / 25/	946 U							0	278	45	27								
6703706																						
	112LEON	23	7 / 14/	1943 U										195								
	112LEON	23	8 / 23/	943 U										209								
	112LEON	23	1 / 25/	946 U							0	274	60	42		16						
6703707																						
	112LEON	23	1 / 24/	946 U							0	272	26	20		20						
6703708																						
	112LEON	16	1 / 24/	946 U							0	253	35	26								
6703709																						
	112LEON	17	1 / 24/	1946 U							0	282	26	38		39						
6703711																						
	112LEON	31	1 / 24/	946 U							0	316	45	37		26						
6703712																						
	112LEON	22	1 / 24/	1946 U							0	298	45	30								

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6703713																						
	112LEON	17	1 / 24/ 19	46 U							0	303	90	100								
6703715																						
	112LEON	12	3 / 28/ 19	46 U							0	310	34	32		30						
6703717																						
	112LEON	25	7 / 14/ 19	43 U										370								
	112LEON	25	8 / 23/ 19	43 U										390								
	112LEON	25	1 / 25/ 19	46 U							0	251	70	191								
6703718																						
	112LEON	21	1 / 25/ 19	46 U							0	276	32	45								
6703719																						
	112LEON	21	1 / 25/ 19	46 U							0	260	22	30								
6703720																						
	112LEON		8 / 23/ 19											30								
	112LEON	25	1 / 25/ 19	46 U							0	274	28	32		48						
6703721																						
	112LEON		7 / 2 / 19				158	12	c 121		0	299.08	127	215		32	812	1380	443	37	2.5	0
	112LEON		7 / 14/ 19											210								
	112LEON		8 / 23/ 19											197								
	112LEON		1 / 25/ 19								0	320	70	155								
	112LEON	28	6 / 20/ 19	064 B	6.8	21	119	9	c 80		0	314.09	54	112	0.4	45	594	986	334	34	1.9	0
6703722																						
(702722	112LEON	15	1 / 25/ 19	46 U							0	277	40	29								
6703723	HALFON	21	7 / 14/ 10	112 D			252	0	112		0	226.07	100	402			1040			26	1.00	0
	112LEON 112LEON		7 / 14/ 19				252	9	c 112		0	226.07	108	402		55	1049		665	26	1.89	0
6703801	112LEON	21	1 / 25/ 19	46 U							26	306	60	102								
0703801	112LEON	15	2 / 16/ 10	112 D	7.2	17	140	7.05	. 75		0	272.00	40	160	0.4	52	C27		202	20	1.67	0
	112LEON 112LEON		3 / 16/ 19		7.2 7.2	20	142 142	7.05 7	c 75		0	273.08 292.88	49 69	160	0.4	53	637 635		383	29	1.67 1.56	0
			3 / 31/ 19						c 70		0			128	< 0.4	55			383	28		-
	112LEON 112LEON		4 / 3 / 19		7.5 7.3	21 14	125 126	8 6.1	c 86 54	12	0	298.98 322.09	70 47	91 82	0.4 < 0.4	106 54	654 553	941	344 339	35 25	2.01 1.28	0
	112LEON 112LEON		8 / 12/ 19		7.3	19	120	14	c 25	12	0	336.1	47	43	0.4	40	475	941	362	13	0.57	0
	112LEON		5 / 4 / 19		7.4	21	107	7	c 50		0	336.1	49	43	0.2	23	465		295	26	1.26	0
6703802	HZLEON	13	3 / 4 / 19	л Б	7.4	21	107	,	C 30		U	330.1	49	43	0.2	23	403		293	20	1.20	U
0703802	112LEON	25	3 / 16/ 19	1/12 D	7.1	25	420	29	c 304		0	223.07	187	1030	< 0.4	20	2125		1167	36	3.87	0
	112LEON		4 / 2 / 19		7.1	32	343	21	c 276		0	241.07	292	724	< 0.4	27	1833		942	38	3.91	0
	112LEON 112LEON		4 / 2 / 19		7.2	32	346	25	c 359		0	250.07	370	724	0.4	71	2107		966	36 44	5.02	0
	112LEON		2 / 8 / 19		7.4	12	246	15	269	15	0	293.08	321	465	0.6	60	1547	2560	675	46	4.5	0
	112LEON 112LEON		8 / 12/ 19		7.4	25	158	11	c 212	1.3	0	342.1	263	224	0.0	38	1099	2300	439	51	4.3	0
	112LEON 112LEON		7 / 16/ 19		7.5	20	109	7	c 116		0	329.09	141	85	0.2	22	662		300	45	2.91	0
6703803	TIZLEON	23	, , 10, 19	- J1 Β	1.3	20	109	,	C 110		U	347.07	141	0.5	0.5	22	002		300	43	2.71	U
0703003	112LEON	15	11 / 29/ 19	138 B	7.7	27	168	15	c 99		0	290.08	86	211	0.4	89	838		480	30	1.96	0
	112LEON 112LEON		3 / 16/ 19		7.1	24	286	19	c 167		0	183.05	121	604	0.4	35	1346		791	31	2.58	0
	112LEON 112LEON		3 / 31/ 19		7.1	30	285	18	c 204		0	250.07	220	540	< 0.4	33 44	1346		791 785	36	3.17	0
	11211011	13	5 / 51/ 15	D	1.2	50	203	10	C 204		Ü	230.07	220	540	V		1404		103	50	J.17	Ü

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	112LEON	15	4 / 3 / 19	945 B	7.2	23	207	14	c 199		0	281.08	200	355	0.4	84	1220		574	42	3.61	0
	112LEON	15	2 / 8 / 19	946 B	7.4	15	166	10	147	11	0	308.09	174	218	0	60	952	1600	455	41	3	0
	112LEON	15	8 / 12/ 19	947 B	7.4	21	133	13	c 121		0	329.09	141	142	0.2	40	773		385	40	2.68	0
	112LEON	15	5 / 4 / 19	951 B	7.6	24	104	8	c 116		0	323.09	109	103	0.5	27	650		292	46	2.95	0
	112LEON	15	1 / 7 / 19	963 B	7.5		114	9	85		0	311.09	72	101	0.3	54	588	1140	321	36	2.06	0
	112LEON		1 / 12/ 19		7.5		120	9	89		0	330.71	80	104	0.6	48	613	1145	336	36	2.11	0
	112LEON	15	2 / 22/ 19	966 B	7.6		112	7	77		0	295.32	69	84	0.6	39	533	1020	308	35	1.91	0
	112LEON		5 / 12/ 19		7.4		115	6	78		0	294.1	66	97	0.6	33	540	1050	311	35	1.92	0
	112LEON		2 / 15/ 19		7.5		116	9	83		0	322.17	89	98	0.5	32	585	1113	326	35	2	0
	112LEON		2 / 17/ 19		7.4		114	10	66		0	297.76	66	84	0.6	39.5	526	996	325	30	1.59	0
	112LEON		4 / 13/ 19		7.2		122	8	71		0	298.98	73	100	0.5	31	552	1057	337	31	1.68	0
	112LEON		2 / 15/ 19		7.3		131	11	71		0	286.78	65	131	0.4	39	589	1141	372	29	1.6	0
	112LEON		2 / 17/ 19		7.4		122	9	78		0	292.08	73	111	0.5	40	577	1120	341	33	1.84	0
	112LEON	15	7 / 19/ 19	977 B	7.5	21	130	7.9	54		0	352.68	48	79	0.4	20.9	534	987	357	24	1.24	0
6703804									404			244.40		# 0	0.4						• • • •	
	112LEON		5 / 4 / 19		7.6	21	88	9	c 106		0	311.19	96	78	0.4	26	577	020	256	47	2.88	0
c=02005	112LEON	25	2 / 22/ 19	000 B	7.4		102	11	63		0	285.56	65	66	0.5	42	489	930	299	31	1.58	0
6703805	112LEON	21	7 / 14/ 10	M2 II										262								
			7 / 14/ 19																			
	112LEON 112LEON		8 / 23/ 19								0	361	60	315 162								
6703806	112LEON	21	1 / 29/ 19	740 U							U	301	60	102								
0703800	112LEON	20	7 / 14/ 19	M2 II										88								
	112LEON		8 / 23/ 19											84								
	112LEON		1 / 29/ 19								0	278	34	43		61						
6703807	TIZEEON	2)	1 / 25/ 15	40 0							Ü	276	34	43		01						
0703007	112LEON	24	1 / 24/ 19	946 U							0	381	90	72								
6703808																						
	112LEON	18	1 / 29/ 19	946 U							0	268	95	93		165						
6703809																						
	112LEON	28	1 / 29/ 19	946 U							0	332	105	292								
6703810																						
	112LEON	30	1 / 24/ 19	946 U							0	340	230	327								
6703811																						
	112LEON	35	1 / 25/ 19	946 U							0	330	40	46								
6704202																						
	124WLCX	27	8 / 7 / 19	946 U							0	317	46	38		0						
6704401																						
	124WLCX	128	4 / 12/ 19	946 U							24	460.07	90	408		2.5						
6704501																						
	124WLCX	120	7 / 27/ 19	953 U		47					0	159	137	119	0.1	0.2	653	1090				
	124WLCX	120	2 / 12/ 19	962 B	7	49	194	20	c 81		0	264.07	332	128	0.2	0	934	1330	566	23	1.48	0
6704502																						
	124WLCX	110	3 / 14/ 19	946 B	7.4	36	132	18	36	17	0	376	72	85	0	0.8	581	961	403	16	0.78	0

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6704503																						
	124WLCX	70	4 / 12/ 1	946 U							0	100	75	374		5.5						
	124WLCX	70	1 / 13/ 1	970 B	7	43	73	13.5	65	5	0	112.27	28	189	0.1	4.5	476	903	237	37	1.83	0
	124WLCX	70	7 / 19/ 1	977 B	7.1	49	83	15.7	73		0	137.9	27	196	0.1	10.9	522	1008	271	36	1.92	0
6704504																						
	124WLCX	150	8 / 7 / 1	946 U							0	339	60	44		0						
6704506																						
	124WLCX	97	8 / 7 / 1	946 U							0	332	45	101								
6704511																						
	124WLCX		4 / 29/ 1		7.8	21	120.1	27.2	108	7.2	0	285.56	151.5	181	0.4	0	728	1150	411	36	2.32	0
6704512	124WLCX	323	10 / 21/ 1	992 B	7.19	31	87	22	92	7.3	0	285.56	125	107	0.58	< 0.04	612	963	308	39	2.28	0
0704312	124WLCX	336	6 / 5 / 1	000 D	6.95	42.6	107	20.8	73.8	3.79	0	258.71	113	121	0.11	< 0.22	610	1114	353	31	1.71	0
	124WLCX 124WLCX		3 / 25/ 2		7.08	38.2	96.6	19	72.8	3.41	0	262.37	102	115	0.11	0.18	577	970	319	33	1.71	0
	124WLCX		6 / 14/ 2		7.00	33.5	103	20.5	72.4	3.3	0	268.47	108	113	0.23	< 0.44	587	843	342	32	1.77	0
6704601	124WECA	330	0 / 14/ 2	000 Б	7.2	33.3	103	20.3	72.4	3.3	Ü	200.47	100	113	0.5	V 0.44	367	043	342	32	1.7	Ü
0,0,001	124WLCX	185	8 / 5 / 1	946 U							0	416	220	372		0						
6704602																						
	124WLCX	174	8 / 5 / 1	946 U							0	622	200	141		0						
6704605																						
	124WLCX	100	6 / 12/ 1	978 B	7.7	46	68	15	90		0	250.17	50	128	0.3	< 0.4	520	959	231	45	2.57	0
6704701																						
	124WLCX	82	4 / 4 / 1	947 B			118	23	c 43		0	236.06	120	116		2	538	909	389	19	0.95	0
6704709																						
	124WLCX	136	9 / 26/ 1	963 B	7.1		172	45	545	16	0	305.09	725	650			2303	4044	614	65	9.57	0
6704710																						
	124WLCX	445	2 / 4 / 1	952 B	7.38	22	67.2	13.5	c 65.5		0	158.6	108.6	86			440		223	38	1.91	0
6704801																						
	124WLCX	206	8 / 2 / 1	946 U							0	370	26	35								
6704803																						
* ***********************************	124WLCX	494	10 / 11/ 1	995 B	7.9		30	13	109		0	279.46	43	61	0.6	< 0.04	394	748	128	64	4.19	2.01
6704901				**									2.5	4.50								
6704902	124WLCX	327	8 / 3 / 1	946 U							0	266	25	152								
6704902	124WLCX	216	4 / 17/ 1	046 11							12	560	490	190								
6704904	124WLCX	216	4 / 17/ 1	946 U							12	568	480	180								
0704904	124WLCX	270	11 / 6 / 1	969 B	7.6	31	92	36	54	4	0	261.15	23	186	0.5	< 0.4	555	1106	377	23	1.21	0
6704905	124W ECA	270	11 / 0 / 1	,0, B	7.0	31	72	50	54	7	· ·	201.13	23	100	0.5	. 0.4	333	1100	311	23	1.21	· ·
0,0,00	124WLCX	200	8 / 3 / 1	946 U							0	352	20	76								
6704906																						
	124WLCX	295	6 / 24/ 1	964 B	7.3	19	108	88	c 451		0	604.17	244	610	0.1	2	1819	3000	631	60	7.81	0
6705402																						
	124WLCX	200	8 / 5 / 1	946 U							0	517	70	308								
6705701																						

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	124WLCX	165	8 / 3 / 19	946 U							0	662	95	332								
6705702																						
6705703	124WLCX	350	8 / 5 / 19	946 U							0	364	130	205								
0703703	124WLCX	160	6 / 24/ 19	964 B	7	15	178	88	c 474		0	636.18	216	770	0.3	3	2057	3410	806	56	7.26	0
6705801	124 11 ECA	100	0 / 24/ 1	70+ B	,	13	170	00	C 474		Ü	050.10	210	770	0.5	3	2037	3410	000	50	7.20	Ü
	124CRRZ	27	6 / 24/ 19	964 B	6	95	26	13	c 60		0	32.01	17	96	1.1	83	406	565	118	52	2.4	0
6705802																						
	124WLCX	419	6 / 24/ 19	964 B	7.4	38	80	16	c 99		0	236.06	4.8	200	0.2	0.2	554	1010	265	44	2.64	0
6710101	112LEON	26	2 / 0 / 19	0/12 P	7.6	14	90	23	c 18	3.4	0	325.09	19	21	0.2	57	405	737	319	10	0.44	0
6710103	TIZLEON	20	2 / 0 / 1:	743 В	7.0	14	90	23	C 16	3.4	Ü	323.09	19	21	0.2	37	403	131	319	10	0.44	Ü
	112LEON	29	6 / 13/ 19	946 U							9.8	245	60	102		60						
6710104																						
	100ALVM	23	3 / 4 / 19	986 B	8.1	15	96	5.2	12	2	0	251.39	43	9	0.3	44.57	350	625	260	9	0.32	0
6710201	112LEON	25	2 / 14/ 19	046 B	7.2	14	244	28	155	22	0	265.07	183	426	0.6	99	1301	2250	724	31	2.51	0
6710202	TIZELON	23	2 / 14/ 1	740 B	1.2	14	244	20	155	22	Ü	203.07	103	420	0.0	"	1301	2230	724	31	2.51	O
	112LEON	34	4 / 9 / 19	946 U							0	244	170	450		52						
6710203																						
	100ALVM		6 / 20/ 19		6.8	22	178	19	c 189		0	268.07	273	268	0.7	62	1143	1780	522	44	3.6	0
6710201	100ALVM	30	8 / 18/ 19	977 B	8	25	315	31	250		0	264.82	291	637	0.6	78.8	1758	3562	913	37	3.6	0
6710301	112LEON		3 / 28/ 19	946 U							0	306	240	248		81						
6710501																						
	100ALVM	35	8 / 9 / 19	946 U							0	268	65	126		108						
6710502																						
<710504	112LEON	21	5 / 9 / 19	946 U							0	420	210	443		168						
6710504	112LEON	24	4 / 8 / 19	946 II							0	296	55	30		38						
6710801	TIZELON	24	47 07 1	740 0							Ü	270	33	30		36						
	100ALVM	34	2 / 13/ 19	962 B	6.7	12	78	16	11	0.7	0	275.08	26	22	0.3	3.8	305	538	260	8	0.3	0
6710802																						
	100ALVM	30	4 / 8 / 19	946 U							0	391	24	28		0.5						
6710901	124WLCX	27	2 / 0 / 19	0/13 R	8	15	67	19	c 12	3.4	0	257.08	26	20	0.6	10	299		245	9	0.33	0
6710907	124WLCA	21	27 07 1	743 В	0	13	07	19	C 12	3.4	Ü	237.08	20	20	0.0	10	299		243	,	0.55	Ü
	124WLCX	18	4 / 3 / 19	946 U							17	275	1460	467								
6710908																						
	124WLCX	30	4 / 3 / 19	946 U							0	638	340	308		231						
6711101	1101 FON	20	4 / 10/ 1/	046 II							0	200	75	00		97						
6711104	112LEON	20	4 / 19/ 19	740 U							0	308	75	98		86						
0/11104	112LEON		3 / 29/ 19	946 U							0	300	36	27		19						

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6711105																						
	112LEON		1 / 30/ 19	46 U							0	261	36	36		49						
6711202																						
	112LEON	28	4 / 19/ 19	46 U							0	304	40	72		62						
6711203																						
	112LEON	74	3 / 20/ 19	46 U							0	346	100	770		260						
6711204																						
(711201	112LEON	29	3 / 20/ 19	46 U							0	357	20	157		150						
6711301	124WI CV	224	2 / 14/ 10	152 D	7.25	16	05.0	0.6	. 01.2		0	272.2	27.7	67			470		252	41	2.2	1.05
6711306	124WLCX	324	2 / 14/ 19	52 В	7.35	16	85.8	9.6	c 81.2		0	373.3	27.7	67			470		253	41	2.2	1.05
0/11300	124WLCX	138	3 / 3 / 19	64 B	7.4	33	155	22	c 177		0	486.14	66	265	0.2	24	981	1680	477	44	3.52	0
6711307	12.112611	150	3, 3, 1,	0. D		33	100	22	0 177			100.11	00	200	0.2		,01	1000	***	••	3.52	Ü
0,1130,	124WLCX	76	4 / 16/ 19	46 U							0	292	12	80		118						
6711308																						
	124WLCX	52	4 / 16/ 19	46 U							0	292	15	20		20						
6711309																						
	124WLCX	100	4 / 2 / 19	64 B	7	20	92	2.6	c 17		0	272.08	15	20	0.3	13	313	532	240	13	0.48	0
	124WLCX	100	7 / 20/ 19	77 B	7.6	9	63	17	151		0	124.48	121	229	0.2	< 0.4	651	1305	226	59	4.36	0
6711310																						
	124WLCX	50	1 / 30/ 19	46 U							0	309	16	36		32						
6711311																						
	124WLCX	110	4 / 2 / 19	064 B	7.1	28	168	29	c 165		0	308.09	181	322	0.5	1.2	1046	1780	538	39	3.09	0
6711312																						
	124WLCX	2500	1 / 30/ 19	146 B			66	19	c 279		0	356.1	50	358		1.2	948		242	71	7.79	0.98
6711501	124WLCX	169	2 / 20/ 10	MC II							0	244	140	156		0.5						
6711502	124WLCX	168	3 / 20/ 19	46 U							0	344	140	156		0.5						
6/11502	124WLCX	04	3 / 20/ 19	46 II							0	300	650	430		30						
6711601	124WLCA	24	3 / 20/ 19	40 0							U	300	030	430		30						
0/11001	124WLCX	125	5 / 9 / 19	58 B	7.8	32	82	5.8	c 49		0	358.1	15	17	0.4	0	377	611	228	31	1.41	1.3
6711606							-				-				***	-		***				
	124WLCX	97	5 / 3 / 19	46 U							15	222	14	30		85						
6711607																						
	112LEON	68	5 / 3 / 19	46 U							22	214	22	35		126						
6711608																						
	112LEON	86	5 / 3 / 19	46 U							29	207	16	33		130						
6711618																						
	124WLCX	35	2 / 2 / 19	46 B			364	67	c 172		0	432.12	613	400		1.5	1829		1183	24	2.17	0
6711619																						
	124WLCX	168	5 / 19/ 19	71 B	7.4	32	121	14	29		0	367.32	41	54	0.2	< 0.4	472	852	359	14	0.67	0
6711620																						
_	124WLCX		5 / 20/ 19	71 B	7.2	34	284	22	118		0	311.19	49	530	0.4	4.5	1194	2496	799	24	1.82	0
6711623																						

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State Well Number	Aquifer	Depth	Date	B/U	pН	Silica	Calcium	Magnesium	Sodium	Potassium	Carbonate	Bicarb.	Sulfate	Chloride	Fluoride	Nitrate	Dissolved Solids	Spec. Cond umhos	Hardness as CaCO3	% Sodium	SAR	RSC
	124WLCX	400	10 / 21/ 19	992 B	6.72	37	158	17	63	4	0	322.17	66	178	0.19	< 0.04	682	1122	465	22	1.27	0
	124WLCX	400	6 / 5 / 19	998 B	6.57	41.8	163	18.5	69	3.44	0	314.85	79	223	0.06	< 0.22	754	1450	484	23	1.37	0
	124WLCX	400	3 / 25/ 20	002 B	6.68	37.8	164	18.2	71.9	3.41	0	317.29	78.9	223	0.15	0.14	754	1323	485	24	1.42	0
	124WLCX	400	6 / 14/ 20	006 B	6.78	33.6	186	19.7	74.8	3.3	0	317.28	87	235	0.2	< 0.44	797	1149	547	23	1.39	0
6711701																						
	124WLCX	30	4 / 3 / 19	946 U							0	478	300	480		540						
6711702																						
	124WLCX	42	4 / 3 / 19	946 U							0	542	55	104		0						
6711703																						
	124WLCX	56	4 / 3 / 19	946 U							0	408	44	42		1						
6711704																						
	124WLCX	65	4 / 3 / 19	946 U							0	38	850	190								
6711705																						
	124WLCX	130	11 / 14/ 19	963 B	7.6	28	280	61	c 290		0	360.1	240	730		6.7	1812	3130	949	39	4.09	0
6711801																						
	124WLCX	14	3 / 20/ 19	946 U							0	106	100	49		110						
6711902																						
	124WLCX	44	5 / 7 / 19	946 U							20	262	360	184		8.7						
6711905																						
	124WLCX	203	1 / 8 / 19	964 B	7.6	23	54	16	138	3.6	0	370	68	97	0.3	0	581	972	200	59	4.24	2.05
6711912																						
	124WLCX	220	5 / 4 / 19	978 B	7.4	51	141	33	136		0	319.73	330	110	0.6	< 0.4	959	1690	487	37	2.68	0
6712101																						
	124WLCX	368 *	2 / 18/ 19	952 B	7.3	11	98.4	10	c 85.9		0	395.3	31.5	82			513		286	39	2.19	0.75
	124WLCX	240	8 / 11/ 19	952 B	7.7	38	98	12	61	1.2	0	367.1	28	71	0.2	0	489	878	293	31	1.55	0.14
6712102																						
	124WLCX		4 / 24/ 19		7.8	15	34.4	6.8	c 197		0	339.1	44.3	154			618		113	79	8.19	3.28
	124WLCX		5 / 22/ 19		8.12	21	15.7	5	c 206.4		0	375.11	33.4	116			581		59	88	11.62	4.95
	124WLCX	283	8 / 6 / 19	952 B	7.8	22	19	6.6	201	0.4	0	354.1	39	124	1	2	589	1030	74	85	10.02	4.31
6712103		2.42				• • •	00.4	40.4	*O.#			242.4	27.2	0.5			40.5		***			0.00
6712104	124WLCX	342	2 / 9 / 19	952 B	7.25	26.8	88.6	18.4	c 69.7		0	363.6	27.3	86			495		296	33	1.77	0.02
6712104		40.4	2 / 22/ 16	.52 D	7.0		24.6	7.0	150.1		0	202.00	01.5	00			505		02	70	7.00	2.02
C712105	124WLCX	484	2 / 22/ 19	952 B	7.9	8	24.6	7.8	c 159.1		0	293.08	81.5	80			505		93	78	7.09	2.93
6712105		264	5 / 15/ 16	.50 B		1.4	12	2.2	2261		0	122	0	126			600		45	0.1	14.60	c 02
C71210C	124WLCX	364	5 / 17/ 19	952 B	8	14	13	3.2	c 226.1		0	423	0	136			600		45	91	14.69	6.02
6712106	124WLCX	0.1	6 / 17/ 16	MC II							0	57	140	170		24						
6712107		91	6 / 17/ 19	946 U							U	37	140	179		34						
6712107		2539	0 / 22 / 10	142 D	7.8	37	87	20	c 104		0	369.11	26	139	0	0.2	594	986	299	43	2.61	0.06
	218EDRD		8 / 23/ 19		7.8	3/	87	20	c 104				26		U	0.2	394	980	299	43	2.01	0.06
6710110	218EDRD	2539	1 / 30/ 19	40 U							0	374	26	126								
6712110		20	6 1 271 16	M6 IT							0	20.4	00	200		1						
(T12:::	124WLCX	39	6 / 27/ 19	40 U							0	294	90	209		1						
6712111		177	1 / 12/ 13	70 P	0	22	70	17		7	0	00.21	122	107	0.2	2	500	052	244	25	1.04	
	124WLCX	175	1 / 13/ 19	9/0 B	8	33	70	17	66	7	0	90.31	133	136	0.2	3	509	952	244	36	1.84	0

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6712112																						
6712113	124WLCX	300	6 / 7 / 1	964 B	7.6	22	35	12	c 154		0	214.06	168	85	0.3	0	581	921	136	71	5.73	0.77
0/12113	124WLCX	213	6 / 23/ 1	952 B	7.22	51	43.2	6.2	c 40.1		0	124.4	35.2	58			294		133	39	1.51	0
6712114																						
	124WLCX	201	6 / 24/ 1	952 B	7.25	28	74.8	5.5	c 44.3		0	209.8	35.8	68			359		209	31	1.33	0
6712115	124WI CV	550	10 / 20/ 1	052 D	0.4	15	0.6	2.5	. 221.2		0	200	26.2	116			507		20	02	15.54	576
6712116	124WLCX	332	10 / 29/ 1	952 В	8.4	15	9.6	3.5	c 221.3		0	398	26.2	116			587		38	92	15.54	5.76
	124WLCX	240	11 / 10/ 1	969 B	6.9	17	50	16	61	5	0	93.97	80	115	0.3	< 0.4	390	750	190	41	1.92	0
6712117																						
	124WLCX	200	5 / 20/ 1	971 B	7.2	34	99	7	42		0	250	36	91	0.7	1	433	798	276	24	1.1	0
6712119	124WLCX	302	9 / 17/ 1	070 B	7.83	13	9	3	c 228		0	394.17	13	138			597	1040	34	93	16.81	5.76
6712202	124WECK	302	<i>)</i> / 1// 1)10 B	7.05	13		3	C 220		Ü	374.17	13	150			371	1040	54	,,,	10.01	5.70
	124WLCX	153	6 / 17/ 1	946 U							0	322	120	158		1.8						
6712203																						
<#12201	124WLCX	87	6 / 19/ 1	946 U							0	164	50	206		0						
6712301	124WLCX	300	3 / 14/ 1	946 B	7.5	22	96	59	134	16	0	430.12	96	229	0.6	22	886	1580	482	37	2.65	0
6712302	124WECK	300	3 / 14/ 1)40 B	7.5	22	70	37	154	10	Ü	430.12	70	22)	0.0		000	1500	402	37	2.03	Ü
	124WLCX	126	7 / 16/ 1	946 U							0	358	60	230		0						
6712303																						
6712305	124WLCX	66	6 / 20/ 1	946 U							22	316	250	550	6.5							
0/12303	124WLCX	335	6 / 20/ 1	946 U							24	248	150	375								
6712306																						
	124WLCX	100	8 / 2 / 1	946 U							0	302	40	80		0.5						
6712307																						
6712312	124WLCX	140	8 / 2 / 1	946 U							0	446	45	181		22	467					
0/12312	124WLCX	520	3 / 22/ 1	971 B	8		40	15	105		0	298.98	45	60	0.4	5	417		161	58	3.59	1.67
	124WLCX	520	6 / 5 / 1	998 B	7.52	26.4	24.7	9.99	128	3.19	0	319.73	41.1	50.4	0.35	< 0.22	442	896	103	73	5.49	3.19
	124WLCX	520	3 / 25/ 2	2002 B	7.53	25.6	25.6	10.2	112	2.9	0	318.51	35.7	46.7	0.46	0.26	416	698	106	69	4.74	3.1
6712406				**								240										
6712407	124WLCX	47	4 / 16/ 1	.946 U							5.9	318	16	22		45						
0/1240/	124WLCX	88	5 / 3 / 1	946 U							0	549	65	755		125						
6712408																						
	124WLCX	113	5 / 3 / 1	946 U							0	307	17	25		0.8						
6712412	124WI CV	200	5 / 10 / 1	071 B	7.5	20	66	27	62		0	214.95	50	60	0.2	< 0.4	166	953	275	22	1.62	0
6712413	124WLCX	300	5 / 19/ 1	9/I B	7.5	29	66	27	62		U	314.85	58	69	0.3	< 0.4	466	852	275	32	1.62	0
0/12413	112LWCX	80	5 / 19/ 1	971 B	7	42	156	21	47		0	335.6	54	173	0.4	< 0.4	658	1260	475	17	0.94	0

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6712414																						
	124WLCX	120	5 / 20/ 19	71 B	7	32	550	28	258		0	453.97	93	920	0.3	315	2419	4805	1487	27	2.91	0
6712415																						
	112LWCX	110	5 / 19/ 19	71 B	7.3	21	93	3.2	15		0	273.36	12	14	< 0.1	17	309	544	245	11	0.42	0
6712416	124WI CV	120	5 / 10 / 10	71 D	7.7	25	49	10	96		0	225.6	24	<i>(2</i>)	0.1	< 0.4	421	786	200	48	2.64	1.40
6712417	124WLCX	120	5 / 19/ 19	/1 B	7.7	25	49	19	86		U	335.6	24	63	0.1	< 0.4	431	/80	200	48	2.04	1.49
0/1241/	112LWCX	90	5 / 19/ 19	71 B	7.5	23	93	2.67	8.3		0	253.83	14	13	0.2	12	290	508	242	6	0.23	0
6712418	1122 11 611	,,,	0 , 1,, 1,	2	7.0	23	,,,	2.07	0.0		Ü	200.00			0.2		2,0	200	2.2	Ü	0.23	Ü
	112LWCX	90	5 / 20/ 19	71 B	7.3	31	118	2.4	25.1		0	378.31	9	24	0.2	< 0.4	396	720	304	15	0.63	0.11
6712419																						
	112LWCX	80	5 / 20/ 19	71 B	7.2	22	151	12	64		0	305.09	56	179	0.5	2.5	637	1242	425	24	1.35	0
6712421																						
	124WLCX	99	4 / 12/ 19	81 B	8.2	29	103	4	9		0	303.87	6	14	0.2	22	336	580	273	6	0.24	0
6712423	124001 000	272	5 / 20/ 10	71 D	7.0	22	104	0.7	27		0	2661	24	44	0.2	. 0.4	420	750	20.4	20	0.02	0
6712501	124WLCX	273	5 / 20/ 19	/I B	7.2	32	106	9.7	37		0	366.1	24	41	0.3	< 0.4	430	750	304	20	0.92	0
0/12301	124WLCX	340	3 / 25/ 19	53 B	7.5	45	55	14	c 51		0	241.07	21	60	0.1	0	364	619	194	36	1.59	0.06
	124WLCX	340	4 / 14/ 19		6.8	43	62	17	57	3.1	0	232	44	85	0.3	0	425	708	224	35	1.65	0
	124WLCX		3 / 3 / 19		8	39	79	20.3	105	4	0	270.92	71	158	0.3	0.04	609	1168	280	44	2.73	0
6712502																						
	124WLCX	320	4 / 28/ 19	53 B	7.97	20	56	9.6	c 60.2		0	212.06	30	74			354		179	42	1.96	0
	124WLCX	320	5 / 23/ 19	53 B	7.4	65	60	14	c 63		0	208.06	44	89	0.4	0.2	437	701	207	39	1.9	0
	124WLCX	320	5 / 26/ 19	61 B	7.2		53	15	61		0	203.05	53	70	0.2	< 0.4	352	650	193	40	1.91	0
	124WLCX	320	1 / 7 / 19	63 B	7.2		58	11	55		0	210.06	43	74	0.1	< 0.4	344	702	189	38	1.74	0
	124WLCX	320	4 / 15/ 19		6.8	48	55	14	56	4.2	0	212	43	75	0.2	0	399	654	194	37	1.75	0
	124WLCX		2 / 22/ 19		7.4		59	12	56		0	207.06	40	78	0.3	< 0.4	347	700	196	38	1.74	0
	124WLCX		5 / 12/ 19		7.2		60	13	59		0	212.06	40	82	0.4	< 0.4	359	720	202	38	1.8	0
	124WLCX	320	2 / 15/ 19		7.2		58	14	58		0	212.34	40	82	0.4	< 0.4	357	730	202	38	1.77	0
	124WLCX 124WLCX	320 320	2 / 17/ 19 4 / 13/ 19		7.1 7.1		61 59	13 17	56 56		0	211.12 209.9	42 53	82 80	0.3	< 0.4 < 0.4	358 369	704 720	205 216	37 35	1.7 1.65	0
	124WLCX 124WLCX		2 / 12/ 19		7.1		63	13	54		0	211.12	43	85	0.4	< 0.4	362	725	210	35	1.62	0
	124WLCX		2 / 16/ 19		7.3		62	14	59		0	209.9	44	86	0.4	< 0.4	369	735	212	37	1.76	0
	124WLCX		2 / 26/ 19		7.1		63	14	58		0	211.12	47	89	0.3	< 0.4	375	750	214	37	1.72	0
	124WLCX		7 / 29/ 19		7.9	50	68	13	62		0	212.34	50	91	0.3	< 0.4	439	770	222	37	1.81	0
	124WLCX	320	3 / 3 / 19	86 B	8	44	92	18	81	4	0	242.85	64	164	< 0.1	0.04	586	1120	303	36	2.02	0
6712503																						
	124WLCX	290	2 / 15/ 19	46 U							0	82	70	104								
6712516																						
	124WLCX		11 / 10/ 19		8	14	58.8	13.8	c 50.8		0	251.3	20.6	54			335		203	35	1.55	0.04
	124WLCX		11 / 13/ 19		7.3	36	66	14.4	c 59		0	246.4	26	86			408		223	36	1.72	0
	124WLCX	482 *	11 / 14/ 19	52 B	7.85	12	28	6.3	c 155		0	327.09	37	88			487		95	77	6.89	3.45
6712517	124001 (0)	156	4 4 22 4 12	52 D	0.2	0		12.0	154 -		0	22.6	21.0	146			540		170		5.00	1.01
	124WLCX	456	4 / 22/ 19	55 B	8.3	8	51	12.8	c 154.6		0	336	31.8	146			569		179	65	5.02	1.91

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6712518																						
	124WLCX	50	5 / 17/ 19	946 U							0	312	56	286		0.5						
6712519																						
	124WLCX	160	11 / 17/ 19	969 B	7.6	44	80	19	65	4	0	211.12	60	130	0.3	< 0.4	506	930	277	33	1.7	0
6712520																						
	124WLCX		5 / 11/ 19		6.98	39	52	9	c 61		0	234.31	34	51			361	578	166	44	2.05	0.5
	124WLCX	368	11 / 12/ 19	969 B	7.3	40	66	13	54	4	0	230.65	40	77	0.4	< 0.4	408	740	217	34	1.59	0
6712522	124WLCX	402	2 / 21/ 10	77 D	7.1	22	89	22	02		0	249.05	75	162	0.4		506		216	20	2.27	0
	124WLCX 124WLCX		3 / 21/ 19 10 / 21/ 19		7.1 6.98	32 45	103	23 24	93 80	4.7	0	248.95 247.73	75 69	162 179	0.4 0.26	< 0.04	596 627	1038	316 356	38 32	1.85	0
6712601	124W LCA	403	10 / 21/ 15	772 B	0.56	43	103	24	80	4.7	U	241.13	09	179	0.20	< 0.04	027	1036	330	32	1.65	U
0712001	124WLCX	352	6 / 20/ 19	946 U							0	390	30	106								
6712603																						
	124WLCX	171	2 / 15/ 19	946 U							0	101	7	101		0.8						
6712607																						
	124WLCX	71	6 / 19/ 19	946 U							0	50	764	338		1.5						
6712701																						
	124WLCX	49	6 / 14/ 19	946 U							0	394	80	224		0						
6712703																						
	112LEON	19	6 / 14/ 19	946 U							17	196	16	6		3.2						
6712801																						
	124WLCX	34	5 / 17/ 19	946 U							11	100	40	57		9.6						
6712803																						
	124WLCX	31	5 / 17/ 19	946 U							0	170	848	658								
6713101					= 0				400				=0				22.4			0.4		4.00
	124WLCX 124WLCX		3 / 5 / 19		7.9	4.6 12	12	1.5	102	4.5 3	0	122.03 261.15	78 220	60 174	0.2	1.2 < 0.4	324 839	566 1573	36 84	86 87	7.18 12.74	1.28 2.59
			11 / 17/ 19		7.6	14	23 27	6.6	272	3	0	270.92										
	124WLCX 124WLCX		7 / 20/ 19		7.8 8.1	13	20.6	6 5.6	282 291	3	0	261.15	233 232	177 182	0.2	< 0.4	872 875	1617 1650	92 74	86 89	12.79 14.42	2.6 2.79
6713102	124WLCA	020	3 / 3 / 17	760 Б	0.1	13	20.0	5.0	291	3	U	201.13	232	102	0.2	0.13	673	1050	74	09	14.42	2.19
0/13102	124WLCX	450	3 / 5 / 19	064 B	7.9	19	67	17	81	7.9	0	209.06	103	106	0.2	0	503	846	236	42	2.29	0
	124WLCX		11 / 17/ 19		7.6	15	39	10	143	5	0	305.09	102	75	0.6	< 0.4	540	1001	138	69	5.29	2.23
6713103																						
	124WLCX	302	2 / 0 / 19	064 B	7.4	30	535	120	c 190		0	374.11	802	780	0	1	2641	3850	1828	18	1.93	0
6713201																						
	124CRRZ	198	1 / 12/ 19	970 B	6.5	19	4.2	1.7	9	4	0	14.64	7	17	< 0.1	< 0.4	69	96	17	52	0.92	0
6713303																						
	124RKLW	14	4 / 18/ 19	946 U							0	16	200	154		40						
6713502																						
	124CRRZ	240	1 / 10/ 19	064 U	4	53	5.5	4.4	30	8.4	0	0	80	53	0.2	0.2	234	424	31	67	2.31	0
6713601																						
	124QNCT	65	4 / 18/ 19	946 U							0	72	90	96		76						
6713602																						
	124RKLW	77	3 / 1 / 19	946 U	6.3						0	0	738	300		1						

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Section Sect	State Well Number	Aquifer	Depth	Date	B/U	pН	Silica	Calcium	Magnesium	Sodium	Potassium	Carbonate	Bicarb.	Sulfate	Chloride	Fluoride	Nitrate	Dissolved Solids	Spec. Cond umhos	Hardness as CaCO3	% Sodium	SAR	RSC
Figure F	6713603																						
March Marc		124CRRZ	171	4 / 26/ 19	946 U							0	0	700	1100								
March Marc	6713605																						
Section Sect		124CRRZ	470	2 / 20/ 19	964 B	6.8	37	14	1.2	c 55		0	95.03	33	32	0.4	0	219	326	39	74	3.83	0.76
March Marc		124CRRZ	470	1 / 12/ 19	970 B	7.8	19	305	58	72	16	0	173.29	620	269	0.5	< 0.4	1445	2704	999	13	0.99	0
Column C	6713613																						
March Marc		124RKLW	100	6 / 20/ 19	964 B	6.1	25	118	57	c 131		0	94.03	99	448	0.2	1.8	926	1730	529	35	2.48	0
Column C	6713702	4440000							0.7	•					••	ō.			***				
Column C	4710001	124CRRZ	270	6 / 20/ 19	964 B	6.1	25	6	9.5	c 20		0	65.02	15	20	0	0	127	206	54	44	1.16	0
Column C	6713801	124CDD7	250	5 / 17 / 10)46 II							0	0	240	114		0						
Carriage	6712902	124CRRZ	250	5 / 1// 19	946 U							U	U	240	114		U						
California Cal	0713602	124CDD7	270	2 / 10/ 10	064 D	6.0	27	105	41	a 104		0	225.07	256	220	0.2	0.2	1074	1660	655	25	1 77	0
Carlow 1	6713001	124CKKZ	270	2 / 19/ 15	704 D	0.9	37	193	41	C 104		U	223.07	330	230	0.2	0.2	1074	1000	033	23	1.//	U
Column C	0/13/01	1240NCT	16	1 / 26/ 10	046 II							16	206	35	102		110						
Column C	6714401	124Q11C1	10	4 / 20/ 1.	740 0							10	200	33	102		110						
Column C	0,11101	124RKLW	120	1 / 14/ 19	964 B	6.1	76	39	19	c 114		0	48.01	186	135	0.1	0.2	592	912	175	58	3.74	0
24CRIX 500 0 0 3 196 8 4.3 48 9 90 90 0 0 0 0 0 0	6714403																						
14/10 1		124CRRZ	500	10 / 3 / 19	963 B	4.3		48	9	90		0	0	270	50			467		157	55	3.13	0
14/10 1							27	0.2	0.1			0				0.2	0		808				1.46
1240NCT 19 19 19 19 19 19 19 1																	1.02						
6714701 7614707 761470	6714406																						
124QNCT 10 27 194 0 11 124QNCT 110 27 67 194 8 69 49 6 2 c 66 5 67 194 1		124CRRZ	550	6 / 20/ 19	964 B	7.3	10	105	26	c 41		0	268.07	199	22	0	0	534	868	368	19	0.93	0
6714704 124QNCT	6714701																						
6714801 124QNCT		124QNCT	97	5 / 2 / 19	946 U							0	65	45	256		3.5						
6714801 671	6714704																						
124QNCT 59 2 19 1964 8 6.7 45 74 20 78 10 6602 6 261 0.3 9.6 526 997 266 38 2.08 0 124QNCT 124QNCT 125 127 177 18 17 177 18 17 177 18 17 17		124QNCT	110	2 / 6 / 19	964 B	6.9	49	6	2	c 66		0	70.02	88	12	0.2	0.2	257	338	23	86	5.96	0.68
124QNCT 59 8 / 12 / 1970 8 6.9 46 52 10 54 4 0 106.17 13 128 0.3 5 364 660 170 40 1.8 0 1.8 0 1.8 0 1.8 1.	6714801																						
124QNCT 59 8 7 7 1977 8 7.4 52 47 7 48 0 125.7 23 89 0.4 7.1 335 592 146 41 1.73 0 124QNCT 59 3 3 1986 8 7.7 45 34 7 51 2 0 92.75 26 88 0.4 6.56 305 544 113 49 2.08 0 0 0 0 0 0 0 0 0		124QNCT	59	2 / 19/ 19	964 B	6.7	45	74	20	78		0	66.02	6	261	0.3	9.6	526	997	266	38	2.08	0
124QNCT 59 3 7 3 1946 B 7.7 45 34 7 51 2 0 92.75 26 88 0.4 6.56 305 544 113 49 2.08 0 124QNCT 59 9 22 1939 B 6.4 48 47 8.5 64 2.7 0 115.93 35 107 0.38 10.54 380 583 152 47 4.07 0 0 0 0 0 0 0 0 0			59	8 / 12/ 19	970 B	6.9	46	52	10	54	4	0	106.17	13	128	0.3	5	364	660	170	40	1.8	0
124QNCT 59 9 22 1993 8 6.4 48 47 8.5 64 2.7 0 115.93 35 107 0.38 10.54 380 583 152 47 4.07 0 0.07						7.4		47	7	48		0		23	89	0.4	7.1	335		146	41	1.73	0
6714803 124QNCT 475 10 26 198 B 7.08 26.31 264 62 87.1 22.3 0 179.39 866 104 0.08 < 0.22 1521 915 17 1.25 0 124QNCT 475 4						7.7											6.56						
124QNCT 475 10 / 26/ 1998 B 7.08 26.31 264 62 87.1 22.3 0 179.39 866 104 0.08 < 0.22 1521 915 17 1.25 0 124QNCT 475 3 / 25/ 2002 B 6.95 24.3 263 62.8 86.4 22 0 180.61 800 101 < 0.1 0.28 1449 1948 915 17 1.24 0 180 1948 1948 1948 1948 1948 1948 1948 1948		124QNCT	59	9 / 22/ 19	993 B	6.4	48	47	8.5	64	2.7	0	115.93	35	107	0.38	10.54	380	583	152	47	4.07	0
124QNCT 475 3 / 25 / 2002 B 6.95 24.3 263 62.8 86.4 22 0 180.61 800 101 < 0.1 0.28 1449 1948 915 17 1.24 0 6719108 124WLCX 99 4 / 3 / 1946 U	6714803																						
6719108 124WLCX 99 4 / 3 / 1946 U 0 308 260 845 1.5 6719201 124WLCX 182 3 / 20/ 1946 U 0 226 500 231 0.5 6719202 124WLCX 123 8 / 9 / 1946 U 0 242 1110 468 0																							
124WLCX 99 4 / 3 / 1946 U 124WLCX 182 3 / 20/ 1946 U 124WLCX 182 3 / 20/ 1946 U 124WLCX 123 8 / 9 / 1946 U 0 226 500 231 0.5 6719202 0 242 1110 468 0		124QNCT	475	3 / 25/ 20	002 B	6.95	24.3	263	62.8	86.4	22	0	180.61	800	101	< 0.1	0.28	1449	1948	915	17	1.24	0
6719201 124WLCX 182 3 / 20/ 1946 U 0 226 500 231 0.5 6719202 124WLCX 123 8 / 9 / 1946 U 0 242 1110 468 0 6719301	6719108				**								***		0.45								
124WLCX 182 3 / 20/ 1946 U 0 226 500 231 0.5 6719202 124WLCX 123 8 / 9 / 1946 U 0 242 1110 468 0	<=10201	124WLCX	99	4 / 3 / 19	946 U							0	308	260	845		1.5						
6719202 124WLCX 123 8 / 9 / 1946 U 0 242 1110 468 0 6719301	6719201	10.4907 077	400	2 / 22/ ::									20.5	#00									
124WLCX 123 8 / 9 / 1946 U 0 242 1110 468 0 6719301	(510000	124WLCX	182	3 / 20/ 19	946 U							0	226	500	231		0.5						
6719301	6/19202	124WI CV	100	0 / 0 / 1/)46 IT							0	242	1110	470		0						
	(71000:	124WLCX	123	8 / 9 / 19	940 U							U	242	1110	468		U						
124WILEA 3/0 3 / 0 / 1940 U 0.95 80 1/0 U 198 120 200 /08	6719301	124WI CV	270	2 / 0 / 1/)46 IT	6.05		90		170		0	100	120	200			760					
		124WLCX	3/0	3 / 0 / 19	740 U	0.95		80		1/0		U	198	120	200			/08					

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State Well Number	Aquifer	Depth	Date	B/U	pН	Silica	Calcium	Magnesium	Sodium	Potassium	Carbonate	Bicarb.	Sulfate	Chloride	Fluoride	Nitrate	Dissolved Solids	Spec. Cond umhos	Hardness as CaCO3	% Sodium	SAR	RSC
	124WLCX	370	5 / 17/ 19	946 U							0	198	120	196		2						
6719302																						
	124WLCX	190	8 / 9 / 19	946 U							0	118	13	70		0						
6719304																						
	124WLCX	406	1 / 8 / 19	064 B	8.1	11	13	8.1	c 846		0	720.2	16	920		1.8	2170	3840	65	96	45.52	10.49
6719306	124001 000	220	1 / 0 / 10	×4 B		42	1.42	21	02	5.0	0	240	100	212	0.0	0	024	1270	102	20	1.02	0
	124WLCX		1 / 8 / 19		6.7	43	142	31	92	5.3	0	240	190	212	0.8	0	834	1370	482	29	1.82	0
	124WLCX 124WLCX		1 / 14/ 19		7.6	35	126	30	106	4 7	0	290.44	180	177	0.6	< 0.4	801	1503	437	34	2.2	0
6719308	124 W L C X	330	8 / 17/ 19	9// В	7.9	32	87	24	135	/	0	318.51	194	117	0.2	< 0.4	753	1395	315	48	3.3	U
6/19308	124WLCX	72	1 / 8 / 19	164 D	6.6	45	75	21	117	4.3	0	190	172	146	0.6	0	674	1080	274	47	3.08	0
6719401	124WLCA	12	1 / 6 / 19	704 B	0.0	43	75	21	117	4.3	Ü	190	1/2	140	0.0	U	074	1000	274	47	3.06	U
0/1/401	100ALVM	27	6 / 25/ 19	M6 II							0	538	140	164		24						
6719402	100/12 111	27	0 / 25/ 1)	-40 0							v	550	140	104		2-7						
0,1,102	124WLCX	120	8 / 6 / 19	946 II							0	407	50	83		0						
6719506	121112011	120	0, 0, 1,										50	05		Ü						
	124WLCX	36	6 / 25/ 19	946 U							0	360	8	18		9.6						
6719507																						
	124WLCX	315	2 / 12/ 19	946 U							0	366	3	84		0						
6719601																						
	124WLCX	259	10 / 22/ 19	942 B	8.5	16	12	5	409		0	653	163	167	< 0.4	< 0.4	1093		50	94	25.03	9.69
	124WLCX	259	2 / 0 / 19	943 B	8.4	6	2.7	1.7	c 419	5	46	534	178	163	0.2	0	1084		13	98	45.98	10.01
	124WLCX	259	8 / 19/ 19	943 B	8.3	21	29	7	c 385		0	628	180	168	0.5	< 0.4	1099		101	89	16.65	8.27
	124WLCX	259	5 / 8 / 19	945 B	8.4	14	5	1	430		0	609	196	176	0.9	0.9	1123		16	98	45.92	9.65
	124WLCX	259	7 / 23/ 19	947 B	8.5	16	10	4	444		0	732	161	170	0.2	1.3	1166		41	95	30.01	11.17
	124WLCX	259	1 / 25/ 19	951 B	8.6	12	11	6	430		0	652	183	185	0.1	< 0.4	1148		52	94	25.91	9.64
	124WLCX	259	6 / 21/ 19	954 B	8.7	10	2	4	451		0	634	211	185	0.3	0.9	1175		21	97	42.36	9.96
	124WLCX	259	12 / 12/ 19	955 B	8.8	12	2	1	440		0	591	221	178	0.2	< 0.4	1145		9	99	63.43	9.5
	124WLCX	259	6 / 6 / 19	960 B	8.5		3	1	405		0	597	215	183	0.2	< 0.4	1101	1916	11	98	51.73	9.55
	124WLCX	259	6 / 24/ 19	064 B	8.3	14	2	1	433	1.6	14	542	227	175	0.5	0.2	1134	1840	9	99	62.42	9.17
	124WLCX	259	12 / 2 / 19	969 B	8.5	11	1.8	2.06	433	1	10.8	527.19	240	170	0.5	< 0.4	1129	2025	12	98	52.31	8.74
	124WLCX	259	2 / 27/ 19	986 B	8.4	10	79	17	21	2	2.4	252.61	35	46	0.8	5.36	342	675	267	14	0.56	0
6719602																						
	124WLCX	304	10 / 22/ 19	942 B	8.7	17	15	6	405		0	560	223	174	0.6	0.7	1116		62	93	22.35	7.94
	124WLCX		2 / 0 / 19		8.4	8	2	1.4	c 416	5.2	43	457	227	170	0	0	1097		10	98	55.19	8.71
	124WLCX	304	8 / 19/ 19		8.5	23	27	6	c 393		0	569	226	173	0.5	< 0.4	1128		92	90	17.82	7.48
	124WLCX		5 / 8 / 19		8.4	15	7	1	c 404		0	546	218	174	0.8	< 0.4	1088		21	97	37.83	8.52
477.040.0	124WLCX	304	6 / 23/ 19	947 B	9	19	7	4	c 441		0	629	222	174	0.2	1.3	1177		33	96	32.94	9.63
6719603	40.000					4-	_	_			= :	<u>-</u>	0.				***			0=		40
-20-0-0-	124WLCX	312	6 / 22/ 19	954 B	8.6	13	7	5	c 813		24	647	91	809	0.3	< 0.4	2080		38	97	57.34	10.64
6719605	124001 000	207	1 / 25/ 12)51 P	0.	11			. 410		10	C77 20	122	140	0.1	. 0.4	1007		20	0.5	20.22	10.02
	124WLCX		1 / 25/ 19		8.6	11	9	4	c 419		18	677.29	133	160	0.1	< 0.4	1087		38	95	29.22	10.92
	124WLCX	307	6 / 22/ 19		8.7	12	3	4	c 437		24	671.19	158	156	0.3	1.3	1125		23	97	38.85	11.32
	124WLCX	307	12 / 12/ 19	iss B	9	12	12	3	c 450		30	646.78	157	174	0.2	< 0.4	1156		42	95	30.1	10.75

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1898 C. 1898 C. 1898 1	State Well Number	Aquifer	Depth	Date	B/U	pН	Silica	Calcium	Magnesium	Sodium	Potassium	Carbonate	Bicarb.	Sulfate	Chloride	Fluoride	Nitrate	Dissolved Solids	Spec. Cond umhos	Hardness as CaCO3	% Sodium	SAR	RSC
		124WLCX	307	6 / 6 / 19	60 B	8.4		6	2	500		4.8	656.55	170	343	0.2	< 0.4	1349	2575	23	97	45.16	10.46
March Marc		124WLCX	307	6 / 20/ 19	64 B	8.2	14	5.8	3.8	575	2.2	0	686.2	171	385	0.4	0.8	1495	2500	30	97	45.59	10.64
Figure F		124WLCX	307	12 / 2 / 19	69 B	8.5	12	9	5	610	3	8.4	629.7	195	462	0.5	< 0.4	1614	3042	43	96	40.45	9.74
Part		124WLCX	307	9 / 12/ 19	72 B	7.8		11	7	770		0	646.78	225	710	0.5	< 0.4	2041	3875	56	96	44.66	9.48
Part	6719606																						
March Marc									=														
Marche M																							
Control Cont			447	6 / 24/ 19	64 B		14	1.5			2.3			202	220	0.6	2.5			10	98	65.79	
Marke Mark		124WLCX	447	9 / 12/ 19	72 B	8.6		1	2	482		18	744.41	140	198	0.7	< 0.4	1208	2240	10	98	64.03	12.59
Marke Mark	6719607																						
Part							15																
Canal Cana												-								•			
Columbia																							
Fig. 1		124WLCX	331	12 / 2 / 19	69 B	8.6	8	5.4	3.65	630	2	15.6	688.28	145	479	0.6	< 0.4	1628	3068	28	97	51.34	11.23
Figure	6719608		#40										***			0.4		400	2210	4.0		40.00	
Sample S	6710600	124WLCX	519	2 / 7 / 19	46 B	8.3	15	2.2	1.3	525	22	51	682	212	222	0.4	1.2	1387	2310	10	99	69.37	12.66
619615 14 15 15 15 15 15 15 15	0/19009	124771 677	204	0	46 11							0	002	2	1.110								
Cameric Came	6710612		284	8 / 6 / 19	46 U							0	803	3	1410								
6719615	0/19012		200	2 / 7 / 10	46 D	7.4	26	122		70	0.0	0	107.10			0	0.5	502	001	220	22	1.07	0.41
24W1CX 150 17 / 1946 18 17 18 19 17 19 19 19 19 19 19	6710612		300	2 / 7 / 19	46 B	7.4	26	122	6.1	78	9.9	0	427.12	63	68	0	0.5	583	981	329	33	1.87	0.41
14WICX 150 12 4 1969 18 18 19 18 115 3 3 3 3 3 19 77 0 3 4 493 912 196 56 3.57 2.53 2.55	0/19013		150	2 / 7 / 10	46 D	77	21	00	22	65	6.5	0	410.12	22	72	0	0.2	506	022	210	20	1.50	0.40
6719615 12WLCX																							
124WLCX 124W	6710614	124W LCA	130	12 / 4 / 19	09 D	1.1	16	49	16	113	3	U	394.17	19	//	0.3	< 0.4	493	912	190	30	3.37	2.33
6719615 124WLCX	0/19014	124WI CV	260	2 / 11 / 10	40 D	9.05	0	77	26	a 101		0	215.06	76	100			£01		200	42	2.54	0
124WLCX 230 12 9 1969 B 7.3 17 123 39 97 0 231.87 129 252 0.2 < 0.4 771 1551 467 31 1.95 0 0 0 0 0 0 0 0 0	6710615		200	2 / 11/ 19	47 D	8.03	0	//	20	C 101		U	213.00	70	100			361		296	42	2.54	U
6719628 124WLCX 230 12 9 1969 B 7.4 17 117 41 98 3 0 246.51 122 251 0.2 < 0.4 770 1540 460 31 1.99 0 0 0 0 0 0 0 0 0	0/1/013		230	12 / 9 / 19	69 B	7.3	17	123	39	97		0	231.87	129	252	0.2	< 0.4	771	1551	467	31	1 95	0
6719628 124WLCX 232 * 5 8 1968 8 8.58 12 7 3 c 306 132 435.66 135 181 891 1560 29 95 25.97 6.98 124WLCX 339 * 5 9 1968 8 8.77 11 3 1 c 308 216 569.9 4 127 55 1280 11 98 39.44 98 124WLCX 345 6 124WLCX 345 6 124WLCX 345 6 124WLCX 345 6 124WLCX 345 12 124WLCX 345 12 12 12 12 12 12 12 1											3												-
124WLCX 232 * 5 / 8 / 1968 B 8.58 12 7 3 c 326 13.2 435.66 135 181 891 1560 29 95 25.97 6.98 124WLCX 339 * 5 / 9 / 1968 B 8.77 11 3 1 c 308 21.6 569.9 < 4 127 755 1280 11 98 39.34 9.83 124WLCX 435 5 / 22 / 1968 B 8.77 13 6 3 c 379 0 512 95 235 235 982 1680 27 96 31.55 7.85	6719628	124 W ECA	250	12 /)/ 1)	0) B	7.4	1,	117	71	70	5	Ü	240.51	122	231	0.2	₹ 0.4	770	1540	400	31	1.22	Ü
124WLCX 339 * 5 / 9 / 1968 8 8.77 11 3 1 c 308 21.6 569.9 4 127 755 1280 11 98 39.34 9.83 9.85 124WLCX 435 5 / 22 / 1968 8 8.37 13 6 3 c 379 0 512 95 235 235 982 1680 27 96 31.55 7.85	0,1,020	124WLCX	232 *	5 / 8 / 19	68 B	8 58	12	7	3	c 326		13.2	435 66	135	181			891	1560	29	95	25 97	6.98
124WLCX 435 5 / 22 1968 B 8.37 13 6 3 c 379 0 512 95 235 982 1680 27 96 31.55 7.85 6719629 124WLCX 525 12 / 8 / 1969 B 8.7 11 3 2 2 520 1 250																							
6719629 124WLCX									3														
124WLCX 525 12 / 8 / 1969 B 8.7 11 3 2 520	6719629																						
124WLCX 525 12 / 8 / 1969 B 8.7 12 3 2 520 1 252 727.33 197 214 0.6 < 0.4 1332 2400 15 98 57.06 12.45 6719643 124WLCX 340 5 / 4 / 1978 B 7.9 12 11 11 1296 0 710.24 7 1692 0.4 < 0.4 3379 6804 72 97 66.12 10.19 6719644 124WLCX 180 2 / 12/ 1962 B 7.4 33 58 27 72 4.1 0 290.08 42 98 0.3 1.8 478 826 255 37 1.96 0 6719645 124WLCX 149 4 / 22/ 1946 U 5 5 5 158 0.8 5 7 158 0.8 5 7 158 5		124WLCX	525	12 / 8 / 19	69 B	8.7	11	3	2	520		20.4	727.33	197	217	0.4	< 0.4	1328	2400	15	98	57.06	12.29
6719643 124WLCX 340 5 / 4 / 1978 B 7.9 12 11 11 1296		124WLCX	525	12 / 8 / 19	69 B	8.7	12	3	2	520	1	25.2	727.33	197	214	0.6	< 0.4	1332	2400		98	57.06	12.45
6719644 124WLCX 180 2 / 12/ 1962 B 7.4 33 58 27 72 4.1 0 290.08 42 98 0.3 1.8 478 826 255 37 1.96 0 6719645 124WLCX 149 4 / 22/ 1946 U	6719643																						
124WLCX 180 2 / 12/ 1962 B 7.4 33 58 27 72 4.1 0 290.08 42 98 0.3 1.8 478 826 255 37 1.96 0 6719645 124WLCX 149 4 / 22/ 1946 U		124WLCX	340	5 / 4 / 19	78 B	7.9	12	11	11	1296		0	710.24	7	1692	0.4	< 0.4	3379	6804	72	97	66.12	10.19
6719645 124WLCX 149 4 / 22/ 1946 U 20 218 55 158 0.8 6719647 124WLCX 150 7 / 26/ 1946 U 0 1114 2 498 0	6719644																						
124WLCX 149 4 / 22 / 1946 U 20 218 55 158 0.8 6719647 124WLCX 150 7 / 26 / 1946 U 0 1114 2 498 0		124WLCX	180	2 / 12/ 19	62 B	7.4	33	58	27	72	4.1	0	290.08	42	98	0.3	1.8	478	826	255	37	1.96	0
6719647 124WLCX 150 7 / 26/ 1946 U 0 1114 2 498 0	6719645																						
124WLCX 150 7 / 26/ 1946 U 0 1114 2 498 0		124WLCX	149	4 / 22/ 19	46 U							20	218	55	158		0.8						
	6719647																						
6720101		124WLCX	150	7 / 26/ 19	46 U							0	1114	2	498		0						
	6720101																						

^{*} Depth value here reflects the bottom of the SAMPLED INTERVAL which was different from the completed well depth

State Well Number	Aquifer	Depth	Date	B/U	pН	Silica	Calcium	Magnesium	Sodium	Potassium	Carbonate	Bicarb.	Sulfate	Chloride	Fluoride	Nitrate	Dissolved Solids	Spec. Cond umhos	Hardness as CaCO3	% Sodium	SAR	RSC
	124WLCX	300	5 / 7 / 1	946 U							20	252	120	153		3.5						
	124WLCX	300	3 / 27/ 1	979 B	8.1	23	39	13	182		0	268.48	100	164	0.4	< 0.1	653	1240	150	72	6.45	1.38
6720102																						
	124WLCX		2 / 2 / 1	946 B			4.6	1.9	c 786		30	1082	2	558		2	1916		19	98	77.84	18.35
6720104																						
	124WLCX	580	3 / 4 / 1	964 B	8.6	12	3	1.3	c 756		83	924	0	540		0.2	1849	3140	12	99	96.56	17.65
6720108																						
	124WLCX	263	3 / 27/ 1	979 B	8.5	16	16	6	530		12	915.26	2	320	1.3	< 0.1	1353	2560	64	94	28.68	14.11
6720109																						
	124WLCX	185	3 / 27/ 1	979 B	8.7	13	4	2	648		30	839.6	95	433	1.6	0.3	1639	3045	18	98	66.06	14.4
6720202																						
	124WLCX	14	7 / 16/ 1	.946 U							0	62	190	83		76						
6720203	40.000											440										
	124WLCX	46	7 / 16/ 1	.946 U							0	410	17	146		9.4						
6720204	40.000	2.0							***			4000.00					4040		404			40.00
6720205	124WLCX	360	6 / 11/ 1	956 B			24	32	690		0	1020.29	17	599			1863		191	88	21.69	12.89
6720203	124WI CV	100	6 / 24/ 1	064 B		44	220	00	. 127		0	207.00	467	500	0.5	2	1604	2540	1160	10	1.62	0
6720402	124WLCX	190	6 / 24/ 1	964 В	6.6	44	320	88	c 127		0	296.08	467	500	0.5	2	1694	2540	1160	19	1.62	0
6720402	124WI CV	24	7 / 16/ 1	046 11							10	257	CO	20		7.0						
6720403	124WLCX	24	7 / 16/ 1	.946 U							12	257	60	39		7.6						
0720403	124WLCX	321	11 / 29/ 1	063 B	8	15	1	2.3	c 713		0	1010.29	0	520		1.8	1749	3020	11	99	89.69	16.32
6720408	124W LCA	321	11 / 2)/ 1	,003 B	0	13	1	2.3	C 713		O	1010.27	O	320		1.0	1747	3020	11	,,	67.07	10.52
0720408	124WLCX	172	3 / 27/ 1	979 B	8.8	13	2.8	1.7	656		37.2	835.94	100	431	1.6	< 0.1	1654	3129	13	99	76.32	14.66
6720501	121112011	1,2	3 / 2// 1	,,, 1	0.0		2.0	***	050		37.2	033.5.	100		1.0		100.	3127			70.52	11.00
0720301	124WLCX	19	7 / 3 / 1	946 U							0	76	32	78		100						
6720601																						
	124CRRZ	91	4 / 4 / 1	947 B			23	10	c 70		0	20	55	116		16	299	547	98	60	3.07	0
6720602																						
	124CRRZ	80	5 / 7 / 1	946 U							0	0	85	69		0						
6720604																						
	124CRRZ	97	4 / 4 / 1	947 B			32	22	c 118		0	8.01	185	154		15	529	934	170	60	3.93	0
6720703																						
	124WLCX	285	5 / 7 / 1	946 U							0	837	1	1210		0						
	124WLCX	285	12 / 6 / 1	963 B	7.7	13	14	14	c 1510		0	2080.59	0	1180		0	3754	6130	92	97	68.28	32.25
6720704																						
	124WLCX	19	5 / 7 / 1	946 U							0	145	280	246		3						
6720706																						
	124WLCX	200	1 / 23/ 1	964 B	8.1	14	1.8	0.4	c 517		0	876.25	125	198	0.7	0.2	1287	2130	6	99	90.78	14.24
6720707																						
	124WLCX	240	1 / 23/ 1	964 B	7.8	13	6	3.2	c 1100		0	1940.55	0.2	590		0.5	2667	4270	28	98	90.21	31.24
6720708																						
	124WLCX	81	5 / 7 / 1	946 U							0	944	55	215		0						
6720801																						

^{*} Depth value here reflects the bottom of the SAMPLED INTERVAL which was different from the completed well depth

State Well Number	Aquifer	Depth	Date	B/U	pН	Silica	Calcium	Magnesium	Sodium	Potassium	Carbonate	Bicarb.	Sulfate	Chloride	Fluoride	Nitrate	Dissolved Solids	Spec. Cond umhos	Hardness as CaCO3	% Sodium	SAR	RSC
	124CRRZ	120	5 / 3 / 1	1946 U							0	29	14	57		0						
6720802																						
	124WLCX	200	1 / 23/	1964 B	6.2	30	16	14	c 41		0	80.02	23	68	0.1	0.2	231	399	97	47	1.81	0
	124WLCX	200	7 / 29/	1977 B	7.1	66	132	29	52		0	141.56	315	88	0.7	< 0.4	752	1290	448	20	1.07	0
6721104																						
	124CRRZ	300	6 / 20/ 1	1964 B	4.3	50	13	5.2	23	9.5	0	0	59	44	0	0	203	303	53	48	1.37	0
	124CRRZ	300	7 / 29/ 1	1977 B	6.7	48	35	7	26	10	0	23.19	105	39	0.2	< 0.4	282	438	116	32	1.05	0
6721202																						
	124CRRZ	157	5 / 17/ 1	1946 U							0	109	360	165		0						
6721203																						
	124CRRZ	381	5 / 2 / 1	1978 B	7.2	41	138	22	74		0	128.14	308	112	0.2	< 0.4	758	1352	435	27	1.54	0
6721302																						
	124CRRZ	334	1 / 10/	1964 B	7.6	17	48	30	c 78		0	334.09	18	85	0.3	0	440	771	243	41	2.18	0.61
6721303																						
	124QNCT	148	1 / 10/ 1	1964 B	6.4	33	430	148	137	23	0	100.03	1440	365		2	2627	3250	1681	15	1.45	0
6721401																						
	124WLCX	440	12 / 31/	1963 B	4.8	47	6.2	2.6	c 27		0	0	32	37	0.1	0.2	152	224	26	69	2.25	0

^{*} Depth value here reflects the bottom of the SAMPLED INTERVAL which was different from the completed well depth



Appendix E

Groundwater Conservation Districts Rules

The tables presented in this appendix are taken from the <u>Gonzales County Underground</u> <u>Water Conservation District Management Plan</u> and the <u>Rules of the Gonzales County</u> <u>Underground Water Conservation District</u>. They are presented to provide additional information on the conditions of the aquifers that provide groundwater to Caldwell County. Tables are listed as they are presented.

Gonzales County Underground Water Conservation District Management Plan

TABLE 5 GROUNDWATER RECHARGE/ DISCHARGE/ FLOW GONZALES AND CALDWELL COUNTIES

Gonza	Groundwater Recharge/Discharge/Flow Gonzales and Caldwell Counties Gonzales County Underground Water Conservation District										
Aquifer or Confining Unit	Annual Recharge from Precipitation (acre-feet/yr)	Annual Discharge from Aquifer to Surface Water (acre-feet/yr)	Annual Flow Into District (acre-feet/yr)	Annual Flow Out of District (acre- feet/yr)							
Sparta	3,105	2,127	386	70							
Weches	808	521	117	35							
Queen City	7,291	3,583	1,172	126							
Reklaw	2,168	1,935	170	156							
Carrizo	6,927	6,896	8,897	5,732							
Wilcox (upper)	0	0	30	48							
Wilcox (middle)	921	31	2,031	3,488							
Wilcox (lower)	0	0	4,052	2,506							

Data from GAM 08-22 Revised

Table 5 describes the following as listed in the GCUWCD:

- 1. Precipitation Recharge this is the aerially distributed recharge sourced from precipitation falling on the outcrop areas of the aquifers (where the aquifer is exposed at the land surface) within the District.
- 2. Surface Water Outflow this is the total water existing the aquifer (outflow) to surface water features such as streams, reservoirs, and drains (springs).
- 3. Flow Into and Out of District this component describes lateral flow within the aquifer between the districts and adjacent counties.

4. Flow Between Aquifers – this describes the vertical flow, or leakage, between aquifers or confining units. Inflow to an aquifer from as overlaying aquifer will always equal the outflow from the other aquifer.

TABLE 6 GROUNDWATER NET FLOW BETWEEN AQUIFERS GONZALES & CALDWELL COUNTIES

Groundwater Net Flow Between Aquifers Gonzales and Caldwell Counties Gonzales County Underground Water Conservation District								
Aquifer or Confining Unit	Annual Net Flow Between Aquifers (acre-feet/yr)							
Weches into Sparta	4,511							
Queen City into Weches	4,183							
Reklaw into Queen City	3,190							
Carrizo into Reklaw	1,945							
Carrizo into Wilcox (upper)	649							
Wilcox (upper) into Wilcox (middle)	194							
Wilcox (lower) into Wilcox (middle)	190							

Data from GAM 08-22 Revised

TABLE 7 PROJECTED SURFACE WATER SUPPLY GONZALES COUNTY UNDERGROUND WATER CONSERVATION DISTRICT

]	Projected Surf	ace Wa	ater Su	pply				
	Gor	nzales Cour	nty Undergrou	nd Wa	ter Co	nserva	tion Di	strict		
Water User Group	County	River Basin	Source Name	2000 ac- ft/yr	2010 ac- ft/yr	2020 ac- ft/yr	2030 ac- ft/yr	2040 ac- ft/yr	2050 ac- ft/yr	2060 ac- ft/yr
Gonzales	Gonzales	Guadalupe	Guadalupe Run-of-River	1,892	1,892	1,892	1,892	1,892	1,892	1,892
Gonzales CO WSC	Gonzales	Guadalupe	Canyon Lake/ Reservoir	0	532	532	532	532	532	532
Irrigation	Gonzales	Guadalupe	Canyon Lake/ Reservoir	0	6	6	6	6	6	6
Irrigation	Gonzales	Guadalupe	Guadalupe River Combined Run-of-River Irr.	0	1,730	1,730	1,730	1,730	1,730	1,730
Livestock	Gonzales	Lavaca	Livestock Local Supply	46	62	62	62	62	62	62
Livestock	Gonzales	Guadalupe	Livestock Local Supply	5,022	2,366	2,366	2,366	2,366	2,366	2,366
			Total Gonzales	6,960	6,588	6,588	6,588	6,588	6,588	6,588
County Other	Caldwell	Guadalupe	Guadalupe Run-of-River	0	110	110	110	110	110	110
Irrigation	Caldwell	Guadalupe	Guadalupe Run-of-River	0	73	73	73	73	73	73
Livestock	Caldwell	Guadalupe	Livestock Local Supply	31	17	17	17	17	17	17
Livestock	Caldwell	Guadalupe	Livestock Local Supply	153	84	84	84	84	84	84
Gonzales CO WSC	Caldwell	Guadalupe	Canyon Lake/Reservoir	0	5	5	5	5	5	5
			Total Caldwell	184	289	289	289	289	289	289
	Total Pro	jected Surfac	e Water Supply	7,144	6,877	6,877	6,877	6,877	6,877	6,877

Data from the TWDB 207 State Water Plan, Volume 3, Regional Water Planning Group. Apportioned values are presented in italics.

Section 8.1 of the GCUWCD Management Plan indicates that in 2010 water is expected to decrease by 267 acre-feet per year from the 2000 surface water supply estimates (Table 7). The years 2010-2060 are expected to remain stable.

Section 8.2 describes the pumping capacity of a well field and states that the projected groundwater supplies of a water user group may significantly exceed the amount of water actually used by the user because the well fields supplying the user groups have additional or redundant capacity. Overall the district is expected to decrease by 244 acre-feet/ year from 2010 to 2060 (Table 8).

TABLE 8
PROJECTED GROUNDWATER SUPPLY

	Projected Groundwater Supply									
Gonzales County Underground Water Conservation District										
Water User	County	Source Name	2010	2020	2030	2040	2050	2060		
Group			ac-	ac-	ac-	ac-	ac-	ac-		
			ft/yr	ft/yr	ft/yr	ft/yr	ft/yr	ft/yr		
Gonzales	Gonzales	Carrizo-Wilcox	403	403	403	403	403	403		
Nixon	Gonzales	Carrizo-Wilcox	600	600	600	600	600	600		
Waelder	Gonzales	Queen City	665	665	665	665	665	665		
County Other	Gonzales	Carrizo-Wilcox	13	13	13	13	13	13		
County Other	Gonzales	Carrizo-Wilcox	559	559	559	559	559	559		
Manufacturing	Gonzales	Sparta	1,632	1,632	1,632	1,632	1,632	1,632		
Manufacturing	Gonzales	Carrizo-Wilcox	1,786	1,786	1,786	1,786	1,786	1,786		
Mining	Gonzales	Carrizo-Wilcox	3	2	2	2	2	2		
Mining	Gonzales	Queen City	6	6	6	6	5	5		
Mining	Gonzales	Sparta	5	5	5	5	5	5		
Mining	Gonzales	Carrizo-Wilcox	14	14	13	12	12	12		
Irrigation	Gonzales	Queen City	47	40	35	30	26	22		
Irrigation	Gonzales	Sparta	51	44	38	33	28	24		
Irrigation	Gonzales	Carrizo-Wilcox	210	181	156	134	116	100		
Livestock	Gonzales	Carrizo-Wilcox	26	26	26	26	26	26		
Livestock	Gonzales	Queen City	805	805	805	805	805	805		
Livestock	Gonzales	Sparta	329	329	329	329	329	329		
Livestock	Gonzales	Carrizo-Wilcox	1,419	1,419	1,419	1,419	1,419	1,419		
Gonzales CO WSC	Gonzales	Carrizo-Wilcox	1,103	1,103	1,103	1,103	1,103	1,103		
	•	Total Gonzales	9,676	9,632	9,595	9,562	9,534	9,510		
County Other	Caldwell	Carrizo-Wilcox	6	6	6	6	6	6		
County Other	Caldwell	Carrizo-Wilcox	19	19	19	19	19	19		
County Other	Caldwell	Queen City	121	125	129	132	135	138		
Manufacturing		Carrizo-Wilcox	7	7	7	7	7	7		
Mining		Carrizo-Wilcox	2	2	2	2	2	2		
Mining		Carrizo-Wilcox	1	1	2	2	2	2		
Irrigation	Caldwell	Carrizo-Wilcox	4	3	3	2	2	2		
Irrigation		Carrizo-Wilcox	138	123	109	97	86	77		
Irrigation	<u> </u>	Queen City	89	81	74	68	62	56		
Livestock		Carrizo-Wilcox	17	17	17	17	17	17		
Livestock	Caldwell	84	84	84	84	84	84			
Aqua WSC	48	48	48	48	48	48				
Gonzales CO WSC		Carrizo-Wilcox Carrizo-Wilcox	10	10	10	10	10	10		
		Total Caldwell	546	526	510	494	480	468		
Total	Projected Gr	oundwater Supply	10,222	10,158	10,105	10,056	10,014	9,978		

Rules of the Gonzales County Underground Water Conservation District

TABLE 1 WELL CLASSIFICATION

Actual pumping Capacity of Proposed Well (GPM)	Classification		ance From Nearest Authorized Well Site
		Carrizo/Wilcox	Queen City/Sparta
Less than 17.5 GPM	Domestic	None	None
17.5-100 GPM	A	600 Feet	2000 Feet
101-250 GPM	В	1500 Feet	4850 Feet
251-500 GPM	С	3000 Feet	8400 Feet
501-1000 GPM	Domestic	6000 Feet	9600 Feet
1001 GPM and over	Е	12000 Feet	>18,000 Feet

E. Production provision:

The maximum permitted production for a tract of land shall not exceed a total of one (1) acre/foot f water per acre of land owner per year form the Carrizo aquifer or combination of the allowable production from the Queen City and Sparta and Carrizo aquifers. Production from the Queen City Aquifer shall be one (1) acre/foot per year and shall be considered part of the one (1) acre/foot total production allowed on any tract of land. Production from the Sparta aquifer shall be on half (1/2) acre/foot per year and shall be considered part of the one (1) acre/foot total production allowed on any tract of land. Production from the Wilcox aquifer shall be one (1) acre/foot per year and may in addition to any other production permitted for any tract of land. Production is allowed to exceed the permitted capacity by 25% in any average monthly reporting period. The actual calendar year production beginning on January 1st and ending on December 31st may not exceed the permitted pumping capacity for that year. Wells previously permitted to produce at a higher rate shall be reduced to the rate stated in this rule beginning with permits scheduled to be reissued in 2010 and all permits therein after shall be reissued at this rate.

Rule 10 – The Rate of Decline in the confined Portion or Outcrop or any Aquifer

Reductions in the allowable permitted production when levels in artesian wells exceed the levels of drawdown indicated:

TABLE 2
CARRIZO OR WILCOX AVERAGE ARTESIAN DECLINE

Carrizo	Carrizo or Wilcox Average Artesian Decline								
Annual Monthly Average Drawdown	Reduction in current permitted pumpage								
80 feet	5% Reduction of current Ac/ft per Acre								
85 feet	10% Reduction of current Ac/ft per Acre								
90 feet	15% Reduction of current Ac/ft per Acre								
95 feet	20% Reduction of current Ac/ft per Acre								
100 feet	Reduce original permitted pumpage 10%								
105 feet	Reduce original permitted pumpage 20%								
110 feet	Reduce original permitted pumpage 30%								
>115 feet	The Board shall apply additional 10% reductions to the permitted pumpage in addition to the 30% reduction annually.								

TABLE 3
CARRIZO OUTCROP AVERAGE WATER LEVEL DECLINE

Carrizo Outcrop Average Water Level Decline								
Annual Monthly Average Water Level Decline in the Outcrop Area	Reduction in current permitted pumpage							
10% of saturated thickness	Reduce original permitted pumpage 5%							
15% of saturated thickness	Reduce permitted pumpage 10%							
20% of saturated thickness	Reduce permitted pumpage 15%							
25% of saturated thickness	Reduce permitted pumpage 20%							
30% of saturated thickness	Reduce permitted pumpage 25%							
35% of saturated thickness	Reduce permitted pumpage 30%							
40% of saturated thickness	Reduce permitted pumpage 35%							
45% of saturated thickness	Reduce permitted pumpage 40%							
>50% of saturated thickness	The Board shall apply additional 10% reductions to the permitted pumpage in addition to the 40% reduction annually.							

TABLE 4

AVERAGE QUEEN CITY OR SPARTA AVERAGE ARTESIAN DECLINE

Queen Cit	Queen City or Sparta Average Artesian Decline							
Annual Monthly Average Drawdown	Reduction in current permitted pumpage							
40 feet	10% Reduction of current Ac/ft per Acre							
45 feet	20% Reduction of current Ac/ft per Acre							
50 feet	Reduce original permitted pumpage 10%							
55 feet	Reduce original permitted pumpage 20%							
60 feet	Reduce original permitted pumpage 30%							
> 65 foot	The Board shall apply additional 10% reductions to the permitted pumpage in addition to the 30% reduction							
>65 feet	annually.							

TABLE 5 QUEEN CITY OR SPARTA OUTCROP AVERAGE WATER LEVEL DECLINE

Queen City or Sparta Outcrop Average Water Level Decline								
Annual Monthly Average Water Level Decline in the Outcrop Area	Reduction in current permitted pumpage							
5% of saturated thickness	Reduce original permitted pumpage 10%							
10% of saturated thickness	Reduce permitted pumpage 20%							
15% of saturated thickness	Reduce permitted pumpage 30%							
20% of saturated thickness	Reduce permitted pumpage 40%							
25% of saturated thickness	Reduce permitted pumpage 50%							
>30% of saturated thickness	The Board shall apply additional 10% reductions to the permitted pumpage in addition to the 50% reduction annually.							



Appendix F

TWDB Water Use Summary Reports

Historical Water Use Summary by County/Basin

Unit: Acre Feet (ACFT)

	CALDWELL COUNTY											
Year	Basin	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total				
1974	COLORADO	34	0	0	0	16	207	257				
1974	GUADALUPE	3,035	206	0	1,660	54	942	5,897				
		3,069	206	0	1,660	70	1,149	6,154				
1980	COLORADO	69	0	0	0	0	172	241				
1980	GUADALUPE	3,964	219	0	1,600	0	864	6,647				
		4,033	219	0	1,600	0	1,036	6,888				
1984	COLORADO	265	0	0	6	0	138	409				
1984	GUADALUPE	4,827	240	0	688	27	696	6,478				
		5,092	240	0	694	27	834	6,887				
1985	COLORADO	162	0	0	4	0	124	290				
1985	GUADALUPE	4,268	224	0	495	27	623	5,637				
		4,430	224	0	499	27	747	5,927				
1986	COLORADO	71	0	0	4	0	136	211				
1986	GUADALUPE	4,412	223	0	496	0	681	5,812				
		4,483	223	0	500	0	817	6,023				
1987	COLORADO	99	0	0	4	0	133	236				
1987	GUADALUPE	4,518	0	0	496	28	670	5,712				
		4,617	0	0	500	28	803	5,948				
1988	COLORADO	108	0	0	4	0	140	252				
1988	GUADALUPE	4,796	0	0	496	25	701	6,018				
		4,904	0	0	500	25	841	6,270				
1989	COLORADO	226	0	0	10	0	137	373				
1989	GUADALUPE	4,629	0	0	1,188	27	690	6,534				
		4,855	0	0	1,198	27	827	6,907				
1990	COLORADO	216	0	0	20	0	135	371				
1990	GUADALUPE	4,715	0	0	1,355	27	681	6,778				
	007.27.20. 2	4,931	0	0	1,375	27	816	7,149				
1991	COLORADO	188	0	0	0	6	140	334				
1991	GUADALUPE	4,132	0	0	954	7	696	5,789				
	007.27.20. 2	4,320	0	0	954	13	836	6,123				
1992	COLORADO	192		0			139	359				
1992	GUADALUPE	4,264	0	0	22 1,491	6 7	696	6,458				
1002	OUNDALUI L	4,456	0	0	1,513	13	835	6,817				
1002	COLORADO	•										
1993 1993	COLORADO GUADALUPE	211 4,614	0	0	1 118	6	129 640	355 6 380				
1993	GUADALUFE	4,614	2	0	1,118 1,127	6 12	769	6,380 6,735				
400:	001.004.50											
1994	COLORADO	213	0	0	10	6	149	378				

Disclaimer: The Water Use estimates posted are subject to revision as additional data and corrections are made available to the TWDB.

	CALDWELL COUNTY										
Year	Basin	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total			
1994	GUADALUPE	4,505	11	0	1,351	6	741	6,614			
		4,718	11	0	1,361	12	890	6,992			
1995	COLORADO	255	0	0	13	6	151	425			
1995	GUADALUPE	4,500	10	0	1,683	6	756	6,955			
		4,755	10	0	1,696	12	907	7,380			
1996	COLORADO	282	0	0	14	6	133	435			
1996	GUADALUPE	4,904	12	0	1,728	6	668	7,318			
		5,186	12	0	1,742	12	801	7,753			
1997	COLORADO	254	0	0	12	6	146	418			
1997	GUADALUPE	4,330	10	0	1,548	6	723	6,617			
		4,584	10	0	1,560	12	869	7,035			
1998	COLORADO	270	0	0	42	6	137	455			
1998	GUADALUPE	4,543	8	0	1,663	6	679	6,899			
		4,813	8	0	1,705	12	816	7,354			
1999	COLORADO	268	0	0	36	6	153	463			
1999	GUADALUPE	4,550	8	0	1,585	6	757	6,906			
		4,818	8	0	1,621	12	910	7,369			
2000	COLORADO	268	0	0	4	6	154	432			
2000	GUADALUPE	4,661	11	0	985	6	763	6,426			
		4,929	11	0	989	12	917	6,858			
2001	COLORADO	31	0	0	7	3	149	190			
2001	GUADALUPE	4,503	200	0	1,583	3	739	7,028			
		4,534	200	0	1,590	6	888	7,218			
2002	COLORADO	30	0	0	7	3	161	201			
2002	GUADALUPE	4,281	6	0	1,583	3	797	6,670			
		4,311	6	0	1,590	6	958	6,871			
2003	COLORADO	34	0	0	4	3	162	203			
2003	GUADALUPE	4,944	0	0	1,061	3	803	6,811			
		4,978	0	0	1,065	6	965	7,014			
2004	COLORADO	34	0	0	5	3	176	218			
2004	GUADALUPE	4,736	1	0	178	3	875	5,793			
		4,770	1	0	183	6	1,051	6,011			

Disclaimer: The Water Use estimates posted are subject to revision as additional data and corrections are made available to the TWDB.

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Historical Water Use Summary by Groundwater (GW) and Surface Water (SW)

Unit: Acre Feet (ACFT)

	CALDWELL COUNTY											
Year	Source	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total				
1974	GW	3,069	206	0	97	70	253	3,695				
1974	SW	0	0	0	1,563	0	896	2,459				
	Total	3,069	206	0	1,660	70	1,149	6,154				
1980	GW	2,679	34	0	100	0	169	2,982				
1980	SW	1,354	185	0	1,500	0	867	3,906				
	Total	4,033	219	0	1,600	0	1,036	6,888				
1984	GW	3,662	37	0	205	3	82	3,989				
1984	SW	1,430	203	0	489	24	752	2,898				
	Total	5,092	240	0	694	27	834	6,887				
1985	GW	3,252	38	0	144	27	74	3,535				
1985	SW	1,178	186	0	355	0	673	2,392				
	Total	4,430	224	0	499	27	747	5,927				
1986	GW	3,392	38	0	145	0	81	3,656				
1986	SW	1,091	185	0	355	0	736	2,367				
	Total	4,483	223	0	500	0	817	6,023				
1987	GW	3,298	0	0	145	28	80	3,551				
1987	SW	1,319	0	0	355	0	723	2,397				
	Total	4,617	0	0	500	28	803	5,948				
1988	GW	3,345	0	0	145	25	84	3,599				
1988	SW	1,559	0	0	355	0	757	2,671				
	Total	4,904	0	0	500	25	841	6,270				
1989	GW	3,406	0	0	147	27	82	3,662				
1989	SW	1,449	0	0	1,051	0	745	3,245				
	Total	4,855	0	0	1,198	27	827	6,907				
1990	GW	3,589	0	0	674	27	81	4,371				
1990	SW	1,342	0	0	701	0	735	2,778				
	Total	4,931	0	0	1,375	27	816	7,149				
1991	GW	3,106	0	0	0	13	84	3,203				
1991		1,214	0	0	954	0	752	2,920				
	Total	4,320	0	0	954	13	836	6,123				
1992	GW	3,205	0	0	741	13	84	4,043				
1992		1,251	0	0	772	0	751	2,774				
	Total	4,456	0	0	1,513	13	835	6,817				
1993	GW	3,491	2	0	147	12	77	3,729				
1993	SW	1,334	0	0	980	0	692	3,006				
	Total	4,825	2	0	1,127	12	769	6,735				
1994	GW	3,441	11	0	147	12	89	3,700				

Disclaimer: The Water Use estimates posted are subject to revision as additional data and corrections are made available to the TWDB.

	CALDWELL COUNTY											
Year	Source	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total				
1994	SW	1,277	0	0	1,214	0	801	3,292				
	Total	4,718	11	0	1,361	12	890	6,992				
1995	GW	3,408	10	0	220	12	91	3,741				
1995	SW	1,347	0	0	1,476	0	816	3,639				
	Total	4,755	10	0	1,696	12	907	7,380				
1996	GW	3,970	12	0	227	12	80	4,301				
1996	SW	1,216	0	0	1,515	0	721	3,452				
	Total	5,186	12	0	1,742	12	801	7,753				
1997	GW	3,561	10	0	203	12	87	3,873				
1997	SW	1,023	0	0	1,357	0	782	3,162				
	Total	4,584	10	0	1,560	12	869	7,035				
1998	GW	3,794	8	0	716	12	82	4,612				
1998	SW	1,019	0	0	989	0	734	2,742				
	Total	4,813	8	0	1,705	12	816	7,354				
1999	GW	3,768	8	0	616	12	91	4,495				
1999	SW	1,050	0	0	1,005	0	819	2,874				
	Total	4,818	8	0	1,621	12	910	7,369				
2000	GW	3,743	11	0	137	12	91	3,994				
2000	SW	1,186	0	0	852	0	826	2,864				
	Total	4,929	11	0	989	12	917	6,858				
2001	GW	3,224	200	0	223	6	64	3,717				
2001	SW	1,310	0	0	1,367	0	824	3,501				
	Total	4,534	200	0	1,590	6	888	7,218				
2002	GW	3,065	6	0	223	6	69	3,369				
2002	SW	1,246	0	0	1,367	0	889	3,502				
	Total	4,311	6	0	1,590	6	958	6,871				
2003	GW	3,540	0	0	129	6	69	3,744				
2003	SW	1,438	0	0	936	0	896	3,270				
	Total	4,978	0	0	1,065	6	965	7,014				
2004	GW	3,391	1	0	159	6	75	3,632				
2004	SW	1,379	0	0	24	0	976	2,379				
	Total	4,770	1	0	183	6	1,051	6,011				

Disclaimer: The Water Use estimates posted are subject to revision as additional data and corrections are made available to the TWDB.



Appendix G

Caldwell County Water Rights and Database Dictionary

Data Dictionary - Water Rights Database

(last updated: July 14, 2008)

Field Name	Description				
WRNo	Water Right Number; identifier for water rights.				
WRType	Water Right Type; any of the following: 1 = Application/Permit 2 = Claim 3 = Certified Filing 4 = Returned or Withdrawn 5 = Dismissed/Rejected 6 = Certificate of Adjudication 8 = Temporary Permit 9 = Contract/Contractual Permit/Agreement				
WRSeq	Water Right Sequence Number; numbers the lines of data in each water right.				
AppNo	Indicates the Application number associated with the Permit number (water right number). Use this number to request a Central Records Permit file.				
WRIssueDate	Indicates the date the water right was issued by the TCEQ or predecessors.				
AmendmentLetter	Unique identifier for amendments to water rights.				
CancelledStatusCode	Indicates water right status; any of the following: R = Dismissed/Rejected/Combined T = Totally Cancelled A = Adjudicated P = Partially Cancelled Blank = Current				
Owner Name	Indicates the water right owner name.				
OwnerTypeCode	Indicates type of owner; any of the following: 1 = Individual				
DivAmountValue	Indicates the amount of water authorized for diversion per year, in acre-feet.				
WMCode	Indicates the Watermaster Area in which the water right is located, as follows: CR = Concho River ST = South Texas RG = Rio Grande blank = not in a Watermaster Area				

UseCode	$ 2 = Industrial & 8 = 0 \\ 3 = Irrigation & 9 = 1 \\ 4 = Mining & 11 = 0 $	Recreation Other Recharge Domestic & Livestock Only				
	5 = Hydroelectric 13 = 6 = Navigation	Storage				
Priority Date	Indicates the original date of the original use of the water allocated under that water right. In the Rio Grande basin, priority is instead indicated by class (Priority Class Code).					
Priority Month, Priority Day, Priority Year	Priority date parsed into three columns. U	se these columns to sort.				
(three fields)						
PriorityClassCode	Indicates the priority of the water right in the Rio Grande basin. In order of highest to lowest priority: M or D (municipal or domestic and livestock) A B					
DateCancelled	Indicates the date the water right was canc	elled, per order of the TCEQ.				
ExpireRemarks	Indicates the date the water right or contra	ct is scheduled to expire.				
Acreage	With use 3 (irrigation) data, indicates the r irrigation.	number of acres authorized for				
ResName, ResCap (two fields)	Reservoir Name and Reservoir Capacity in reservoir and the amount of impoundment					
SiteName	Indicates the facility/plant name associated	d with the water right.				
BasinCode	Indicates river basin where the base right i 1 = Canadian 2 = Red 3 = Sulphur 4 = Cypress 5 = Sabine 6 = Neches 7 = Neches-Trinity 8 = Trinity 9 = Trinity-San Jacinto 10 = San Jacinto 11 = San Jacinto-Brazos 12 = Brazos	s located; any of the following: 13 = Brazos-Colorado 14 = Colorado 15 = Colorado-Lavaca 16 = Lavaca 17 = Lavaca-Guadalupe 18 = Guadalupe 19 = San Antonio 20 = San Antonio-Nueces 21 = Nueces 22 = Nueces-Rio Grande 23 = Rio Grande				
RiverOrderNo	River Order Number: Indicates 10 digit no Unit of Water Rights Permitting and locate other diversion points on the stream.					

RegionCode	Indicates the Regional Water Planni located, or to which the water right i	ng Group region(s) where the water right is s related.
	A = Panhandle B = Region B C = Region C D = North East Texas E = Far West Texas F = Region F G = Brazos H = Region H	I = East Texas J = Plateau K = Lower Colorado L = South Central M = Rio Grande N = Coastal Bend O = Llano-Estacado P = Lavaca
SWRACode	Indicates the Special Water Resource Area where the water right is located, or to which a water supply contract is related; any of the following:	
	1 = Meredith 2 = Alan Henry 3 = Chapman (Cooper) 4 = Tawakoni 5 = Lake Fork 6 = Athens 7 = Palestine 8 = Cherokee 9 = Oak Creek 10 = Ivie 11 = Travis 12 = Amistad 13 = Medina 14 = Canyon	15 = Texana 16 = Greenbelt 17 = Possum Kingdom 18 = Granbury 19 = Whitney 20 = Aquilla 21 = Proctor 22 = Belton 23 = Stillhouse Hollow 24 = Georgetown 25 = Granger 26 = Somerville 27 = Limestone
UnnamedTrib	tributary of 'stream name', the next Tributary of the Trinity River. When N (No) or blank, indicates that	version point is located on an <u>unnamed</u> field in the database; for example: Unnamed at the Diversion point is located directly on database; for example: Trinity River.
StreamName	Indicates the stream where the diver	sion point for the water right is located.
OtherStreamName	Indicates the stream where the additional located.	ional diversion point for the water right is

CountyName	1 = Anderson	52 = Crane	103 = Hartley	154 = McCulloch	205 = San Patricio
CountyName	2 = Andrews	53 = Crockett	104 = Haskell	155 = McLennan	206 = San Saba
	3 = Angelina	54 = Crosby	105 = Hays	156 = McMullen	207 = Schleicher
	4 = Aransas	55 = Culberson	106 = Hemphill	157 = Madison	208 = Scurry
	5 = Archer	56 = Dallam	107 = Henderson	158 = Marion	209 = Shackelford
	6 = Armstrong	57 = Dallas	108 = Hidalgo	159 = Martin	210 = Shelby
	7 = Atascosa	58 = Dawson	109 = Hill	160 = Mason	211 = Sherman
	8 = Austin	59 = Deaf Smith	110 = Hockley	161 = Matagorda	212 = Smith
	9 = Bailey	60 = Delta	111 = Hood	162 = Maverick	213 = Somervell
	10 = Bandera	61 = Denton	112 = Hopkins	163 = Medina	214 = Starr
	11 = Bastrop	62 = De Witt	113 = Houston	164 = Menard	215 = Stephens
	12 = Baylor 13 = Bee	63 = Dickens 64 = Dimmit	114 = Howard	165 = Midland 166 = Milam	216 = Sterling 217 = Stonewall
	13 = Bee 14 = Bell	65 = Donley	115 = Hudspeth 116 = Hunt	167 = Mills	217 = Stoffewall 218 = Sutton
	15 = Bear	66 = Duval	117 = Hutchinson	168 = Mitchell	219 = Swisher
	16 = Blanco	67 = Eastland	117 = Trutellinson 118 = Irion	169 = Montague	220 = Tarrant
	17 = Borden	68 = Ector	119 = Jack	170 = Montague	221 = Taylor
	18 = Bosque	69 = Edwards	120 = Jackson	171 = Moore	222 = Terrell
	19 = Bowie	70 = Ellis	121 = Jasper	172 = Morris	223 = Terry
	20 = Brazoria	71 = El Paso	122 = Jeff Davis	173 = Motley	224 = Throckmorton
	21 = Brazos	72 = Erath	123 = Jefferson	174 = Nacogdoches	225 = Titus
	22 = Brewster	73 = Falls	124 = Jim Hogg	175 = Navarro	226 = Tom Green
	23 = Briscoe	74 = Fannin	125 = Jim Wells	176 = Newton	227 = Travis
	24 = Brooks	75 = Fayette	126 = Johnson	177 = Nolan	228 = Trinity
	25 = Brown	76 = Fisher	127 = Jones	178 = Nueces	229 = Tyler
	26 = Burleson	77 = Floyd	128 = Karnes	179 = Ochiltree	230 = Upshur
	27 = Burnet	78 = Foard	129 = Kaufman	180 = Oldham	231 = Upton
	28 = Caldwell	79 = Fort Bend	130 = Kendall	181 = Orange	232 = Uvalde
	29 = Calhoun	80 = Franklin	131 = Kenedy	182 = Palo Pinto	233 = Val Verde
	30 = Callahan	81 = Freestone	132 = Kent	183 = Panola	234 = Van Zandt
	31 = Cameron	82 = Frio	133 = Kerr	184 = Parker	235 = Victoria
	32 = Camp	83 = Gaines	134 = Kimble	185 = Parmer	236 = Walker
	33 = Carson	84 = Galveston	135 = King	186 = Pecos	237 = Waller
	34 = Cass	85 = Garza	136 = Kinney	187 = Polk	238 = Ward
	35 = Castro 36 = Chambers	86 = Gillespie 87 = Glasscock	137 = Kleberg 138 = Knox	188 = Potter 189 = Presidio	239 = Washington 240 = Webb
	37 = Cherokee	88 = Goliad	139 = Lamar	190 = Rains	241 = Wharton
	38 = Childress	89 = Gonzales	140 = Lamb	191 = Randall	241 = Whatton 242 = Wheeler
	39 = Clay	90 = Gray	141 = Lamb	192 = Reagan	243 = Wichita
	40 = Cochran	91 = Grayson	142 = La Salle	193 = Real	244 = Wilbarger
	41 = Coke	92 = Gregg	143 = Lavaca	194 = Red River	245 = Willacy
	42 = Coleman	93 = Grimes	144 = Lee	195 = Reeves	246 = Williamson
	43 = Collin	94 = Guadalupe	145 = Leon	196 = Refugio	247 = Wilson
	44 = Collingswort		146 = Liberty	197 = Roberts	248 = Winkler
	45 = Colorado	96 = Hall	147 = Limestone	198 = Robertson	249 = Wise
	46 = Comal	97 = Hamilton	148 = Lipscomb	199 = Rockwall	250 = Wood
	47 = Comanche	98 = Hansford	149 = Live Oak	200 = Runnels	251 = Yoakum
	48 = Concho	99 = Hardeman	150 = Llano	201 = Rusk	252 = Young
	49 = Cooke	100 =Hardin	151 = Loving	202 = Sabine	253 = Zapata
	50 = Coryell	101 = Harris	152 = Lubbock	203 = San Augustine	254 = Zavala
	51 = Cottle	102 = Harrison	153 = Lynn	204 = San Jacinto	
Remarks	right. Once use	ed for display	ing amendmen	ary to explain on the dates. SC=Spectonservation Se	
BaseWRNo and Type	-				number and type.
• 1				_	
(two fields)	Example: For (Contract No. (100088-9, City	of San Angelo,	the Base Water Right
	and Type is 00:	1008-6. Color	ado River MW	D.	·
				-	

APPENDIX G TCEQ SURFACE WATER RIGHTS DATABASE FOR CALDWELL COUNTY

WR No	WR Type	WR Seq	Owner Name	Owner Type Code	Div Amt Value	Priority Date	Basin Code	Region Code	StreamName
3906	6	1	TEXAS PARKS & WILDLIFE DEPT	2	12	2/22/1972	18	L	CLEAR FRK PLUM CRK
3906	6	2	TEXAS PARKS & WILDLIFE DEPT	2	63	11/26/1979	18	L	CLEAR FRK PLUM CRK
3906	6	3	TEXAS PARKS & WILDLIFE DEPT	2		11/26/1979	18	L	CLEAR FRK PLUM CRK
3905	6	1	ALLAN C ASHCRAFT ET AL	4		9/28/1964	18	L	DRY CRK
3904	6	1	SPENCEWOOD INC	2	28	12/31/1951	18	L	ELM CRK
4213	1	1	BEN B TWIDWELL ET UX	3	120	11/20/1984	18	L	PLUM CRK
3719	1	1	MIGUEL CALZADA URQUIZA ET UX	3	45	7/30/1979	18	L	SALT CRK
3719	1	2	SCHMIDT RANCH LLC	2	623	7/30/1979	18	L	SALT CRK
3594	1	1	ROBERT M KIEHN	1	144	1/30/1978	18	L	SAN MARCOS RIVER
3724	1	1	ROBERT GLASS LANGFORD	1	149	1/28/1980	18	L	SAN MARCOS RIVER
3742	1	1	GEORGE PARTNERSHIP LTD	2	300	3/17/1980	18	L	SAN MARCOS RIVER
3787	1	1	BEN O CORPORATION	2	104	10/6/1980	18	L	SAN MARCOS RIVER
3812	1	1	VNS & CLS PARTNERS LTD	2	240	3/30/1981	18	L	SAN MARCOS RIVER
4057	1	1	CHRISTOPHER G SEEKER ET UX	2	300	6/13/1983	18	L	SAN MARCOS RIVER
4242	1	1	ROBERT L BOOTHE	1	240	5/29/1985	18	L	SAN MARCOS RIVER
4253	1	1	HYDRACO POWER INC	2	15,000	9/25/1984	18	L	SAN MARCOS RIVER
4287	1	1	JOHN T O'BANION JR ET AL	4	320	7/30/1985	18	L	SAN MARCOS RIVER
5092	1	1	CITY OF SAN MARCOS	2	150	9/2/1986	18	L	SAN MARCOS RIVER
5234	1	1	GUADALUPE-BLANCO RIVER AUTHORITY	2	1,022	5/12/1989	18	L	SAN MARCOS RIVER
5857	1	1	GENE MILLIGAN	1	1	10/18/2004	18	L	SAN MARCOS RIVER
3724	1	2	GAYLE LANGFORD TURNER	1	106	1/28/1980	18	L	SAN MARCOS RIVER
3787	1	2	BEN O CORPORATION	2	250	9/6/1985	18	L	SAN MARCOS RIVER
4057	1	2	CHRISTOPHER G SEEKER ET UX	2	300	3/4/1986	18	L	SAN MARCOS RIVER
4242	1	2	DON B MORGAN ET UX	3		5/29/1985	18	L	SAN MARCOS RIVER
5234	1	2	GUADALUPE-BLANCO RIVER AUTHORITY	2		8/6/2003	18	L	SAN MARCOS RIVER
5857	1	2	GENE MILLIGAN	1		10/18/2004	18	L	SAN MARCOS RIVER
3724	1	3	JEARL LEDBETTER ET UX	3	194	1/28/1980	18	L	SAN MARCOS RIVER
3787	1	3	MICHAEL W OHLENDORF ET UX	3	21	10/6/1980	18	L	SAN MARCOS RIVER
5234	1	3	GUADALUPE-BLANCO RIVER AUTHORITY	2		8/6/2003	18	L	SAN MARCOS RIVER
3724	1	4	JEROME V MILLER ET UX	3	1	1/28/1980	18	L	SAN MARCOS RIVER

APPENDIX G TCEQ SURFACE WATER RIGHTS DATABASE FOR CALDWELL COUNTY

WR No	WR Type	WR Seq	Owner Name	Owner Type Code	Div Amt Value	Priority Date	Basin Code	Region Code	StreamName
3787	1	4	MICHAEL W OHLENDORF ET UX	3	50	9/6/1985	18	L	SAN MARCOS RIVER
3889	6	1	CANYON REGIONAL WATER AUTHORITY	2	24	6/23/1914	18	L	SAN MARCOS RIVER
3890	6	1	GEORGE PARTNERSHIP LTD	2	50	8/9/1971	18	L	SAN MARCOS RIVER
3891	6	1	TRI-COMMUNITY WSC	2	500	12/29/1922	18	L	SAN MARCOS RIVER
3895	6	1	EBL INC DEF BEN PENSION PLAN & TRUST	5	580	3/21/1977	18	L	SAN MARCOS RIVER
3896	6	1	GUADALUPE-BLANCO RIVER AUTHORITY	2	1,500	10/12/1976	18	L	SAN MARCOS RIVER
3897	6	1	LULING ECONOMIC DEVELOPMENT CORP	4		6/22/1914	18	L	SAN MARCOS RIVER
3898	6	1	CITY OF LULING	2	20	8/16/1976	18	L	SAN MARCOS RIVER
3899	6	1	SCHMIDT RANCH LLC	2	1,180	3/21/1977	18	L	SAN MARCOS RIVER
3900	6	1	DAVID NEAL PAPE ET AL	4		2/12/1973	18	L	SAN MARCOS RIVER
3895	6	2	EBL INC DEF BEN PENSION PLAN & TRUST	5		3/21/1977	18	L	SAN MARCOS RIVER
3896	6	2	GUADALUPE-BLANCO RIVER AUTHORITY	2	_	1/7/1980	18	L	SAN MARCOS RIVER
3900	6	2	ESTATE OF JAMES D JAMISON	5	750	2/12/1973	18	L	SAN MARCOS RIVER
3895	6	3	EBL INC DEF BEN PENSION PLAN & TRUST	5		3/21/1977	18	L	SAN MARCOS RIVER
3896	6	3	GUADALUPE-BLANCO RIVER AUTHORITY	2	1,300	1/31/1983	18	L	SAN MARCOS RIVER



Appendix H

Water Conservation Measures

WATER CONSERVATION MEASURES

Introduction

Water conservation will provide benefits not only to customers in cost but to society by preserving the environment and our resources by reducing demands on water and wastewater systems. The objective of the Caldwell County Conservation Plan will be to provide on brief overview of current measures undertaken by water utilities and to promote and implement water conservation.

Water conservation has been identified by Region L as a measure to meet future water demands. As growth occurs and new developments flourish, it will be helpful to consider having a list of action items to be implemented to accommodate the increase in customers without a substantial increase in water demands.

Water Supply System Conservation Measures

The water supply systems that currently serve Caldwell County responded in a survey as having implemented the following measures to encourage water conservation:

- Increasing water rates
- Prohibit landscaping between the hours of 10 am to 8 pm
- Biannual newsletters with conservation tips
- Increasing rate blocks
- Install accurate metering devices
- Universal metering
- Meter testing and replacement programs
- Record management system
- Water audits
- Public Education
- Non-promotional water rates
- Leak detection and replacement

- Annual presentations
- Conservation water rate
- Strict Plumbing code enforcement
- Mail updates and conservation mail from groundwater districts

Measures under consideration by water supply systems to encourage water conservation:

- Education
- Reducing per capita consumption by 3%
- Joined SWAP
- Replace meters on schedule to reduce water loss
- Leak monitoring program to identify and repair leaks
- Encourage xeriscaping
- Implement year round water restriction
- Mail out information on a percent basis

As conservation measures are implemented, communicating the benefits of the strategy is one of the best ways to encourage other water suppliers to do likewise. Not only will Conservation Programs slow groundwater drawdown but also reduce cost of water treatment plants by eliminating or delaying expansion resulting in considerable financial savings.

Record Management System

Maintaining accurate and updated records of water distribution and sales are essential record keeping tools needed for operation and management of a profitable water business. Establishing a central system which is able to segregate water sales and water uses for various user classes can provide data quickly and efficiently for review of systems. User classes can include; single-family, multifamily, commercial, industrial, schools, and irrigation.

Water Rate Structure

An increasing water rate structure can motivate customers to reduce water use and practice conservation measures. Establishing an average monthly consumption rate for all classes of users and gradually increasing charge will encourage limits on watering and use. Peak seasonal rates and City Limit boundary considerations should also be included in the rate structure.

Water Audits

Although it is impractical to attain 0% loss in water systems, it can be substantially minimized with monthly, quarterly, semi-annual, or annual audits. Audits require accountability and responsibility for substantial loss is a system. Improvements are required and goals should be established to decrease the losses in a system and kept to a minimum. Larger cities than those in Caldwell have recorded water loss under 10%. Long-term planning at the city level should develop goals of minimum and maximum water loss with action plans ready to be implemented in the event goals are not met.

HB 3338 Water Auditing Reporting Information was enacted in the 78th Legislature in 2003. The bill requires "each retail public utility that provides potable water to conduct a water loss audit once every five years and to report the results of the audit to the Texas Water Development Board (TWDB). The water audit addresses four main points of water loss: loss from distribution lines; inaccuracies in meters; deficiencies in accounting practices; and, theft of service." Submission of the 2006 deadline for the report has resulted in a response rate under 50%.

Metering

Metering all the customer base is the only tool available that can account for water use. Proper calibration and routine testing can increase accuracy of measurements. It would be

beneficial to test every meter before installation and develop a frequent routine to test installed meters. Proper metering for use is important to reduce cost and errors in billings.

Reuse

Reuse/ reclaimed waste water can be utilized for non-potable water uses. Several customers from residential to commercial can utilize the water. Reuse can be considered for the following:

- Schools
- Athletic fields
- Manufacturing businesses
- Gold courses
- Parks
- Apartment/ various housing complexes

Components of the water system to consider would include transmission mains, storage tanks, and pump stations. These systems need to be reviewed further to consider a benefit and cost

Plumbing Fixtures

Rebate Programs and Replacement Programs for single family homes to include toilets, sinks, and shower heads. Eligible fixtures should demonstrate a 20% or more efficiency in water use. Water efficient clothes washers can also be included in the program.



Leak Detection and Repair

Sound detection of leaks is the most common practice to locate faulty joints and broken sections of pipe. Once located, a log should be maintained for repair and a database established and utilized.

Water Efficient Landscaping

As water resources become scarce and rates continue increase other viable solutions for customers include rain water harvesting. The TWDB has published a series of technical guides on rainwater harvesting to promote use. Participation in workshops, seminars, and conference can further the education of local customers.



- Soil Composition
- Depth of soil
- Depth of mulch

Rainwater Harvesting Systems



Rainwater harvesting has gained popularity as different sizes and shapes of tanks are emerging. Below ground rainwater tanks and smaller cisterns are available to offset municipal water use. The water from the cisterns can be for potable and non-potable use.

The TWDB presented a report to the Legislature

in 2006 to on recommendations for minimum water quality standards for indoor potable and non-potable use, treatment methods, conjunctive use with municipal water systems,

and ways in which the state can further promote rainwater harvesting. Additional information can be obtained at http://www.twdb.state.tx.us/iwt/rainwater.asp.

Agricultural Irrigation

Irrigation of agriculture is one the greatest water consumers and currently accounts for a significant amount of the water use in Texas. Surface, sprinkler and drip irrigation art the basic types of irrigation. Drip irrigation has been found to be the most efficient for certain crops.

Establishing schedules based on the crop's needs and monitoring soil moisture and weather help determine the amount of water to apply. Proper grading of the land for use and irrigation practice can be a natural way to reduce water use. Additional conservation methods include:

- Furrow Dinking
- Conservation Tillage
- Tail water Reuse
- Surge Flow
- Low Elevation Spray Application Systems (LESA)
- Canal and Conveyance System Management

Public Education

There are several modes of informing and educating the public that can be utilized. Water conservation education can be transmitted through the following:

- Public Service Announcements
- Workshops and Seminars
- Pamphlets
- Outreach programs
- Schools
- Awards and Recognition
- Creative Competitions (Drawing, Photo, and Essay)



Appendix I

Plum Creek Watershed Protection Plan Best Management Practices

APPENDIX I

BEST MANAGEMENT PRACTICES

Best Management Practices listed in the Plum Creek Watershed Protection Plan to be implemented.

Urban Stormwater Measures

Common Goals

- Implement non-structural components of MS4 permits on a voluntary basis in advance of program requirements
- Conduct stormwater engineering analyses and city-wide assessments to determine placement of structural management measures in individual cities
- Pet waste management, including passage or modification of ordinances and installation and management of pet waste stations

Lockhart

- Enact a pet waste ordinance
- Install 10 pet waste stations and signage
- Nutrient/irrigation water management in park areas
- Manage/periodically relocate duck population at City Park
- Continue/expand existing street sweeping program

Luling

- Reconstruct Cottonwood Creek stormwater retention pond
- Enact a pet waste ordinance
- Install 6 pet waste stations and signage
- Continue/expand existing street sweeping program

Wastewater Management Measures

Wastewater Treatment Facilities

- Promote signing of the East Hays County Wastewater Compact, a key interlocal agreement between multiple entities in the region.
- All WWTFs agree to work toward treatment levels of 5-5-2-1 (BOD/TSS/NH₃/TP) by way of permits for new facilities and voluntary action by existing plants.
- All WWTFs will begin monthly self-monitoring of effluent for bacteria and nutrients.
- All WWTF operators will demonstrate the appropriate licenses and certifications and be current on continuing education opportunities.

APPENDIX I

• The cities of Kyle, Lockhart, and Luling will evaluate costs and feasibility in an effort to implement phosphorous removal techniques for all effluent entering Plum Creek.

Wastewater Infrastructure

- Cities will continue or initiate daily inspections of lift stations and equip all stations with dialers and/or Supervisory Control and Data Acquisition (SCADA) systems.
- Cities will continue to apply for grants to replace old clay pipe sewer lines, and clean and maintain existing sewer lines.
- Cities will work to locate any septic systems that may still be within the city limits and connect those residences to central wastewater treatment.

Cropland Operations Management Measures

To focus management plan development and implementation, management measures, addressing bacteria and nutrient issues will be encouraged and given top priority. Based on site-specific characteristics, plans should include one or more of the following management practices to reduce pollutant loads from agricultural lands:

- Prescribed Grazing: Manages the controlled harvest of vegetation with grazing animals to improve or maintain the desired species composition and vigor of plant communities, which improves surface and subsurface water quality and quantity.
- Riparian Herbaceous Buffers: Establishes an area of grasses, glasslike plants, and forbs along water courses to improve and protect water quality by reducing sediment and other pollutants in runoff as well as nutrients and chemicals in shallow groundwater.
- Grasses Waterways: Natural or constructed channel-shaped or graded and established with suitable vegetation to protect and improve water quality.
- Riparian Forest Buffers: Establishes area dominated by trees and shrubs located adjacent to and up-gradient from watercourses to reduce excess amounts of sediment, organic material, nutrients, and pesticides in surface runoff and excess nutrients and other chemicals in shallow groundwater flow.
- Watering Facilities: Places a device (tank, trough, or other watertight container) that provides animal access to water and protects streams, ponds, and water supplies from contamination through alternative access to water.
- Field Borders: Establishes a strip of permanent vegetation at the edge or around the perimeter of a field to protect soil and water quality.

APPENDIX I

- Filter Strips: Establishes a strip or area of herbaceous vegetation between agricultural lands and environmentally sensitive areas to reduce pollutant loading in runoff.
- Nutrient Management: Manages the amount, source, placement, form, and timing of the application of plant nutrients and soil amendments to minimize agricultural nonpoint source pollution of surface and groundwater resources.
- Conservation Cover: Establishes permanent vegetative cover to protect soil and water.
- Stream Crossings: Creates a stabilized area or structure constructed across a stream to provide a travel way for people, livestock, equipment, or vehicles, improving water quality by reducing sediment, nutrient, organic, and inorganic loading of the stream.
- Alternative Shade: Although not currently an approved cost-share practice, creation of shade reduces time spent loafing in streams and riparian areas, thus reducing pollutant loading. Efforts will be made to include this practice as a component of livestock management plans.



Appendix J

Plum Creek Watershed Protection Plan Management Measures and Outreach Activities

Management Measures as described in the Plum Creek Watershed Protection Plan

	Responsible	W 4. G	Numbe	r Imple	plemented Total (
Management Measure	Party	Unit Cost		Year		Total Cost		
			1-3	4-6	7-10			
Urban Stormwater Man	agement Measu	ires	-		•			
Pet Waste Collection Stations	City of Lockhart	\$620/station installation \$85 annual/station	10	4	4	\$22,040		
Pet Waste Collection Stations	City of Luling	ng \$620/station installation \$85 annual/station		2	2	\$12,475		
Comprehensive Urban Stormwater Assessment	City of Lockhart	of Lockhart \$25,000/survey				\$25,000		
Manage Urban Waterfowl Populations	I LIV OF LOCKDART I I I			N/A				
Comprehensive Urban Stormwater Assessment	1 (1ty of Luling L \$70.000/curvey L L L				\$20,000			
Rehabilitate Stormwater Retention Pond	City of Luling	\$500,000/pond	1			\$500,000		
Wastewater Management	Measures							
Wastewater Upgrade (TSS Reduction)	WWTF Operators	\$500,000/ 1 MGD facility		3	7	\$6,000		
Wastewater Upgrade (Phosphorous Removal)	WWTF Operators	\$60,000/facility (includes material costs)		3	7	\$600,000		
Voluntary Monthly E. coli Monitoring	WWTF Operators	\$22/monthly/facility				\$31,000		
Voluntary Monthly Phosphorous Monitoring	WWTF Operators	\$25/monthly/facility				\$35,000		
Wastewater Management	Measures (contin	nued)						
Sanitary Sewer Pipe Replacement	City of Lockhart	\$320,000/year	1,800 ft	1,800 ft	2,400 ft	\$3,200,00 ³		
Initiate Sanitary Sewer Inspection Program	City of Luling	\$17,000/camera	1			\$17,000 ²		
Sanitary Sewer Pipe Replacement	City of Luling	\$100,000/year	2,400 ft	2,400 ft	3,200 ft	\$10,000,000 ³		
Lift Station SCADA Installation	City of Luling	\$12,000/station	4	1		\$60,000		

Management Measures as described in the Plum Creek Watershed Protection Plan

	Responsible		Numbe	er Imple	emented	
Management Measure	Party	Unit Cost		Year		Total Cost
			1-3	4-6	7-10	
Septic System Inspection/ Enforcement (New Position)	Caldwell County	\$50,000/year		2		\$1,000,000
Septic System Repair	Caldwell/ Hays Cos.	\$5,000/system	300	300	400	\$5,000,000
Septic System Replacement	Caldwell/ Hays Cos.	\$10,000/system	150	150	200	\$5,000,000
Septic System Connection to Sewer	City of Uhland	\$2,000/system	100	100	150	\$700,000
Agricultural Management Measures						
WQMP Technician (New Position)	SWCD	\$75,000/year		1		\$750,000
Livestock Water Quality Management Plans	SWCD	\$10,000/plan	65	70	100	\$2,350,000
Cropland Water Quality Management Plans	\sim 1 SW(1) 1 SHHHHMAN 1 I		6	9	9	\$240,000
Non-Domestic Animal and	l Wildlife Manage	ement Measures				
Feral Hog Control (New Position)	TWDMS	\$90,000/year		1		\$900,000
Feral Hog Control (Equipment)	TWDMS					\$5,000
Monitoring Component						
Targeted Water Quality Monitoring	GBRA		1			\$142,000 ⁴
Comprehensive Stream Assessment	GBRA	\$1,500/assessment	12	12	16	\$60,000
Bacterial Source Tracking	TAMU		1			\$200,000

Outreach Activities as described in the Plum Creek Watershed Protection Plan

Outreach Activity	Responsible Party	Responsible Party Year			Total Cost	
·		1-3	4-6	7-10		
Broad-Based Programs						
Texas Watershed Steward Training Sessions	Extension	3	2	1	N/A	
Elementary School Water Quality Project	GBRA				\$25,000	
Plum Creek Watershed Protection Brochure	GBRA				\$15,000 ¹	
Tributary and Watershed Roadway Signage	PCW Partnership	60			\$6,000	
Displays at Local Events	Extension/TSSWCB	9	9	9	\$5,400	
Watershed Billboards	PCW Partnership	1 si	gn bienni	ially	\$30,000	
Urban Programs						
Pet Waste Programs	Cities/TCEQ/ Extension				\$35,000	
NEMO Workshops		2				
Fats, Oils, and Grease Workshop	GBRA/TCEQ/ Extension	2			\$20,000 ¹	
Municipal Site Assessment Visits		4				
Urban Sector Nutrient Education	Extension	3	3	3	N/A	
Sports and Athletic Field Education (SAFE)	Extension	3	3	3	N/A	
Wastewater Programs						
Develop Septic System Online Training Modules	GBRA	4			\$30,000 ¹	
Septic System Workshops and Assistance			3	3	\$25,000 ¹	
Agricultural Programs						
Soil and Water Testing Campaigns	Extension	3	3	3	N/A	
Agricultural Nutrient Management Education	Extension	3	3	3	N/A	
Crop Management Seminars	Extension	3	3	3	N/A	
Agricultural Waste Pesticide Collection Days	TCEQ	1	1	1	\$75,000	

Outreach Activities as described in the Plum Creek Watershed Protection Plan

Outreach Activity	Responsible Party	Year			Total Cost	
		1-3	4-6	7-10		
Agricultural Programs (
Livestock Grazing Management Education	Extension	3	3	3	N/A	
Non-Domestic Animal a	nd Wildlife Programs					
Feral Hog Management Workshop	Extension	2	1	2	N/A	
Stream and Rparian Workshops	Extension	2	1	2	N/A	
Additional Programs						
Illegal Dumping Site Targeted Cleanup	GBRA	3	3	3	¢40,000 ¹	
Community Stream Cleanup Events	UDKA	2	3	3	\$40,000 ¹	
Rainwater Harvesting Education/Demonstration	Extension	2	1	2	\$25,000	



Appendix K

Regional Compact

APPENDIX K

Whereas the parties to this compact, the cities of Lockhart, Luling, Martindale, Niederwald, Uhland and the Guadalupe-Blanco River Authority (GBRA) all function in Caldwell County and

Whereas all parties share the responsibility to:

- 1. To promote the development, use, and conservation of the water resources in the county
- 2. To plan for the welfare of all local governments and make it possible for all communities to utilize public works services
- 3. To promote and implement feasible conservation measures established
- 4. To balance development in the region and promote sustainable designs
- 5. To develop water quality management measures that will ensure the future use and quality of groundwater and surface water
- 6. To minimizing reliance on On-Site Sewage Facilities (OSSFs)
- 7. To develop inter local agreements and cooperation for the purpose of developing water and wastewater facilities to serve the future population of Caldwell

and whereas all parties recognize that much of the future water and wastewater infrastructure in Caldwell will have to be provided initially by the private sector in new developments, and whereas all parties understand that the common interests will be served by adopting a uniform approach, the parties jointly enter into this compact. The key elements to the compact are:

- 1. The parties recognize that protection of the water resources in Caldwell will require a regional cooperative effort. The overutilization of natural resources is not a sustainable practice and conservation and reuse measures practices will be implemented.
- 2. The parties agree jointly to participate, to the extent desired, in the review of new proposed projects and plans, and in special studies involving rates or other issues. Development of a Good Neighbor Policy to share ideas and plan conservation of resources on a regional basis will provide benefits to the region as a whole.
- 3. The parties will develop and agree on specific conditions that will determine the number of housing units needed for a central wastewater system, but as an initial target agree that OSSFs would not be appropriate for developments of 10 or more homes.
- 4. The parties believe that domestic wastewater treatment is an important public service, with the potential to affect citizens outside of the immediate project area. The parties also recognize that proper operation and maintenance of wastewater infrastructure is essential to the public welfare. Because it is important to the public, the parties agree that central wastewater facility operations should be a public function, and that future wastewater facilities in Caldwell County should

APPENDIX K

be operated by a public rather than a private entity. The parties recognize that the private sector must be involved in the design, permitting and construction of wastewater facilities to serve new developments, but the parties anticipate that these new developments will at some future time become a part of a municipality. As such, the parties agree that central wastewater facilities associated with new developments should be jointly permitted (e.g. private developer and public entity) and operated by the public entity.

- 5. An important aspect of wastewater operations is the quality of the water produced. The parties agree that a high quality effluent that is discharged to surface waters is important and will encourage the level represented by the Texas Commission on Environmental Quality's (TCEQ) 5-5-2-1 effluent set will be the goal for all new facilities. That is operating at full flow with a monthly average effluent quality of BOD5 OF 5MG/l, tss OF 5 MG/l, AMMONIA-Nitrogen of 2 mg/L and total Phosphorus of 1 mg/L. The parties recognize that this goal can be met in several ways including direct treatment, treating to a different level, and meeting the goal by use of an offsetting amount of effluent for irrigation, or through wetland polishing.
- 6. The parties recognize that Caldwell County has limited water resources supplies and that providing good quality water to serve future growth will be a challenge. To conserve water supplies to the extent practical, the parties jointly desire new developments to include provisions to minimize potable water use in irrigation. This can include a purple pipe system for irrigation and/or cisterns for providing water for toilet flushing and lawn irrigation.
- 7. All parties agree to participate in supporting the core provisions of the Compact. For examples, this could include opposing a private permit applicant in the TCEQ hearing process that refused to follow the central treatment, effluent quality, or reuse provisions of the Compact.



Appendix L

Public Meeting Comments on Report and Responses to Comments

klotz 📢 associates

7550 IH-10 West
Northwest Center, Suite 300
San Antonio, Texas 78229
T 210.736.0425 F 210.736.0405
sanantonio.office@klotz.com

SIGN-IN SHEET

Project Name: Caldwell County Regional Water and Wastewater Planning Study

Job No.: 0972.001.000

Date: August 3, 2009

Meeting Type: Stakeholder Group Meeting #3

Name	Organization/Title	Phone/Fax/Cell
DAVIS MEM 1/en	Maxwell WSE	hoih 252 215
Doug Spillmoun	Maxwell WSC	5122272241
MARK SPEEN	CRYSTAL CLEDR WSC	830372 1031
Town Downald	AECOM	672.457-7766
GRAHAM Moore	CAN/HCPUA	512-396-4040
	Governles GWSC	830-672-6579
Daniel Mever	PCCD	512-398-2383
Daniel R. Haideman	county hine sul	512-738-2073
Oscar H. Fogers.	GRRA	512-376-9950
1) (11,	GOON	830-379-5872
John Denn	Loethab	
	City of Lockhart	6418-968-215-1
Johnie Halliburton	Plum Creek Cons. Dist.	512-398-2383

klotz 📢 associates

7550 IH-10 West Northwest Center, Suite 300 San Antonio, Texas 78229 T 210.736.0425 F 210.736.0405 sanantonio.office@klotz.com

SIGN-IN SHEET

Study
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: Caldwell County Regional Water and Wastewater Planning Study
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Job No.: 0972.001.000

Date: August 3, 2009

Meeting Type: Stakeholder Group Meeting #3

Phone/Fax/Cell (930) 379 58みそ(心) (830) 37 5-575/(を火)	379-5822 est 313	512 776 7550					
Organization/Title Guadalupe-Blanco Rwerthultority	7 "	ナメンのふ					
Name Debbie Magin	lin Sedlucok	MATT NECSON					

COMMENTS PUBLIC MEETING CALDWELL COUNTY WATER AND WASTEWATER PLANNING STUDY AUGUST 3, 2009

In the space below please provide input or comments regarding the recommendations in the report.

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^	I PUA PROJEG ARE CHOUEN
	OF THE GROUND WATER PROJE
DISCUSSE	>.
Name: Gra	Ham Moorce
	HAM MOORE -396-4040



COMMENTS PUBLIC MEETING CALDWELL COUNTY WATER AND WASTEWATER PLANNING STUDY **AUGUST 3, 2009**

In the space below please provi	de input or com	ments regardii	ng the recommen	aations in
I think the sen	0-17 11/20	Markot a	i tarant	. 90
The mid basin	Project	may be	n Carget	tota
for now.		0		
Name: Johnie Hal	liburton			
Phone: 5/2-398-2	383			
	Yes	□ No		

RESPONSE TO WRITTEN COMMENT BY GRAHAM MOORE

We agree that the groundwater portions of the GBRA Mid-Basin Project will face the same challenges as the HCPUA Project and have modified the report to reflect that information.

RESPONSE TO WRITTEN COMMENT BY JOHNIE HALLIBURTON

The report recommends the GBRA Mid-Basin Project as one of the strategies to be pursued. No changes were made to the report.



Appendix M

Water Treatment Facilities Cost Estimate Wastewater Treatment Facilities Cost Estimates

Caldwell County Regional Water and Wastewater Planning Study
Regional Water Planning
Water Transmission Line Options
Prepared June 2009

PROJECT COST SUMMARY WITH 12" DISTRIBUTION SYSTEM

ITEM NO.	ITEM DESCRIPTION	AMOUNT
1	Line 1A - Groundwater Source Route to Lockhart	\$33,800,000
2	Line 1B - Groundwater Source Route to Luling	\$30,200,000
3	Line 1C - Surface Water Source Route to Luling	\$51,300,000
4	Line 2 - SH 130 North Route	\$10,221,128
5	Line 3 - Northwest Route to Uhland	\$6,282,922
6	Line 4 - SH 130 West	\$8,608,917

Level of Cost Projection:No Design Completed

abla	No Design Complete
	Preliminary Design
	Final Design

Caldwell County Regional Water and Wastewater Planning Study Regional Water Planning Water Transmission Line Options Prepared June 2009

Transmission Line 1A

GENERAL DEVELOPMENT

ITEM				UNIT	
NO.	ITEM DESCRIPTION	UNIT	QTY	PRICE	AMOUNT
1	MOBILIZATION (10%)	LS	1	\$2,152,524.28	\$2,152,524
2	SITE PREPARATION (7%)	LS	1	\$1,506,767.00	\$1,506,767
3	SEDIMENTATION AND EROSION CONTROL (5%)	LS	1	\$1,076,262.14	\$1,076,262
4	TRAFFIC MAINTENANCE (1.0%)		1	\$215,252.43	\$215,252
5	REPLACING ASPHALT PAVEMENT	SY	93	\$90.00	\$8,400
6	DRIVEWAY REPLACEMENT (AVG)	SY	1,667	\$60.00	\$100,000
7	REMOVE AND REPLACE FENCING (5%)	LF	5,500	\$50.00	\$275,000
8	FILTER FABRIC	LF	109,869	\$1.20	\$131,843
9	INSTALLATION OF CATHODIC TEST STATIONS	LS	1	\$10,000.00	\$10,000
	ESTIMATED SUB TOTAL				

WELL DEVELOPMENT

ITEM				UNIT	
NO.	ITEM DESCRIPTION	UNIT	QTY	PRICE	AMOUNT
1	PUMPS (1,000 GPM) & INSTALLATION	EA	6	\$15,000.00	\$90,000
2	FIELD WELL DEVELOPMENT	LS	1	\$5,000,000.00	\$5,000,000
3	LAND PURCHASE COST	LS	1	\$75,000.00	\$75,000
	ESTIMATED SUB TOTAL				

WATER FACILITIES

ITEM NO.	ITEM DESCRIPTION	UNIT	QTY	UNIT PRICE	AMOUNT
1	STORAGE TANK	GAL	1,000,000	\$0.50	\$500,000
2	WATER TREATMENT PLANT	GPD	8,000,000	\$0.50	\$4,000,000
					\$0
	ESTIMATED SUB TOTAL				\$4,500,000

30-INCH TRANSMISSION MAIN COST

ITEM				UNIT	
NO.	ITEM DESCRIPTION		QTY	PRICE	AMOUNT
1	MOBILIZATION	LS	1	\$84,000.00	\$84,000
2	30-INCH D.I. WATER MAIN (OPEN CUT)	LF	109,701	\$95.00	\$10,421,595
3	30-INCH D.I. WATER MAIN (BORE)	LF	168	\$150.00	\$25,200
4	4 INCH COMBINATION AIR VALVE WITH MANHOLE	EA	10	\$12,000.00	\$120,000
5	30-INCH BUTTERFLY VALVE WITH MANHOLE	EA	10	\$13,000.00	\$130,000
6	FILTER FABRIC	LF	109,869	\$1.00	\$109,869
7	CATHODE ROTECTION	LS	1	\$250,000.00	\$250,000
8	DISINFECT WATER TRANSMISSION MAIN	LF	109,869	\$0.50	\$54,935
9	INSTALLATION CATHODIC TEST STATIONS	LS	1	\$15,000.00	\$15,000
10	TRENCH SAFETY		109,701	\$1.25	\$137,126
		\$11,300,000			

MISC

INITOO					
ITEM				UNIT	
NO.	ITEM DESCRIPTION	UNIT	QTY.	PRICE	AMOUNT
1	SURVEY (1.0 %)	LS	1	\$265,000.00	\$265,000
2	ENGINEERING (10%)	LS	1	\$2,650,000.00	\$2,650,000
	ESTIMATED SUB TOTAL				

Lev	el of Cost Projection:	TOTAL CONSTRUCTION COST =	\$26,500,000.00
\checkmark	No Design Completed	TOTAL ENGINEERING COST =	\$2,900,000
	Preliminary Design	TOTAL=	\$29,400,000
	Final Design		
		15% CONTINGENCY=	\$4,400,000
		CDAND TOTAL -	\$22 PAN AAA

The engineer has no control over the cost of labor, materials, or equipment, or over the Contractor's methods of determining prices, or over competitive bidding or market conditions. As a result, this opinion of probable construction cost is based on the engineer's experience and qualifications and represents our best judgment as design professionals familiar with the construction industry. The engineer cannot and does not guarantee the proposals, bids, or the construction cost will not vary from this opinion of probable cost.

Caldwell County Regional Water and Wastewater Planning Study Regional Water Planning Water Transmission Line Options Prepared June 2009

Transmission Line 1B

GENERAL DEVELOPMENT

ITEM				UNIT	
NO.	ITEM DESCRIPTION		QTY	PRICE	AMOUNT
1	MOBILIZATION (10%)	LS	1	\$1,923,971.00	\$1,923,971
2	SITE PREPARATION (7%)	LS	1	\$1,346,779.70	\$1,346,780
3	SEDIMENTATION AND EROSION CONTROL (5%)	LS	1	\$961,985.50	\$961,986
4	TRAFFIC MAINTENANCE (1.0%)	LS	1	\$192,397.10	\$192,397
5	REPLACING ASPHALT PAVEMENT	SY	31	\$90.00	\$2,800
6	DRIVEWAY REPLACEMENT (AVG)	SY	250	\$60.00	\$15,000
7	REMOVE AND REPLACE FENCING (5%)	LF	5,500	\$50.00	\$275,000
8	INSTALLATION OF CATHODIC TEST STATIONS		1	\$10,000.00	\$10,000
-			ESTIMATE	D SUB TOTAL	\$4,727,933

WELL DEVELOPMENT

ITEM				UNIT	
NO.	ITEM DESCRIPTION	UNIT	QTY	PRICE	AMOUNT
1	PUMPS (1,000 GPM) & INSTALLATION	EA	6	\$15,000.00	\$90,000
2	FIELD WELL DEVELOPMENT	LS	1	\$5,000,000.00	\$5,000,000
3	LAND PURCHASE COST	LS	1	\$45,000.00	\$45,000
		\$5,135,000			

WATER FACILITIES

ITEM				UNIT	
NO.	ITEM DESCRIPTION	UNIT	QTY	PRICE	AMOUNT
1	STORAGE TANK	GAL	1,000,000	\$0.50	\$500,000
2	WATER TREATMENT PLANT	GPD	8,000,000	\$0.50	\$4,000,000
					\$0
	ESTIMATED SUB TOTAL				\$4,500,000

30-INCH TRANSMISSION MAIN COST

ITEM				UNIT	
NO.	ITEM DESCRIPTION	UNIT	QTY	PRICE	AMOUNT
1	MOBILIZATION	LS	1	\$84,000.00	\$84,000
2	30-INCH D.I. WATER MAIN (OPEN CUT)	LF	89,688	\$95.00	\$8,520,360
3	30-INCH D.I. WATER MAIN (BORE)	LF	72	\$150.00	\$10,800
4	4 INCH COMBINATION AIR VALVE WITH MANHOLE		7	\$12,000.00	\$84,000
5	30 INCH BUTTERFLY VALVE WITH MANHOLE	EA	7	\$13,000.00	\$91,000
6	FILTER FABRIC	LF	89,760	\$1.00	\$89,760
7	CATHODE PROTECTION	LS	1	\$250,000.00	\$250,000
8	DISINFECT WATER TRANSMISSION MAIN	LF	89,760	\$0.50	\$44,880
9	INSTALLATION CATHODE TEST STATIONS		1	\$15,000.00	\$15,000
10	TRENCH SAFETY LF 89,688		\$1.25	\$112,110	
	ESTIMATED SUB TOTAL				

MISC

ITEM NO.	ITEM DESCRIPTION	UNIT	QTY.	UNIT PRICE	AMOUNT
1	SURVEY (1.0 %)	LS	1	\$236,648.43	\$236,648
2	ENGINEERING (10%)	LS	1	\$2,366,484.33	\$2,366,484
	ESTIMATED SUB TOTAL				\$2,603,133

Lev ☑	el of Cost Projection: No Design Completed	TOTAL CONSTRUCTION COST = TOTAL ENGINEERING COST =	\$23,664,843.30 \$2,603,133
	Preliminary Design	TOTAL=	\$26,267,976
	Final Design		
		15% CONTINGENCY=	\$3,940,196
		GRAND TOTAL =	\$30,200,000

The engineer has no control over the cost of labor, materials, or equipment, or over the Contractor's methods of determining prices, or over competitive bidding or market conditions. As a result, this opinion of probable construction cost is based on the engineer's experience and qualifications and represents our best judgment as design professionals familiar with the construction industry. The engineer cannot and does not guarantee the proposals, bids, or the construction cost will not vary from this opinion of probable cost.

Caldwell County Regional Water and Wastewater Planning Study Regional Water Planning Water Transmission Line Options Prepared June 2009

Transmission Line 1C

GENERAL DEVELOPMENT

ITEM				UNIT	
NO.	ITEM DESCRIPTION	UNIT	QTY	PRICE	AMOUNT
1	MOBILIZATION (10%)	LS	1	\$3,266,540.00	\$3,266,540
2	SITE PREPARATION (7%)	LS	1	\$2,286,578.00	\$2,286,578
3	SEDIMENTATION AND EROSION CONTROL (5%)	LS	1	\$1,633,270.00	\$1,633,270
4	TRAFFIC MAINTENANCE (1.0%)	LS	1	\$326,654.00	\$326,654
5	REPLACING ASPHALT PAVEMENT	SY	31	\$90.00	\$2,800
6	DRIVEWAY REPLACEMENT (AVG)	SY	250	\$60.00	\$15,000
7	REMOVE AND REPLACE FENCING	LF	4,752	\$50.00	\$237,600
8	INSTALLATION OF CATHODIC TEST STATIONS	LS	1	\$10,000.00	\$10,000
	ESTIMATED SUB TOTAL				

WATER FACILITIES

ITEM				UNIT	
NO.	ITEM DESCRIPTION	UNIT	QTY	PRICE	AMOUNT
1	STORAGE TANK	GAL	1,000,000	\$0.50	\$500,000
2	WATER TREATMENT PLANT	GPD	8,000,000	\$2.75	\$22,000,000
3	PUMPS (1,000 GPM) & INSTALLATION	EA	6	\$12,000.00	\$72,000
4	LAND PURCHASE COST	LS	1	\$30,000.00	\$30,000
	ESTIMATED SUB TOTAL				

30-INCH TRANSMISSION MAIN COST

ITEM				UNIT	
NO.	ITEM DESCRIPTION	UNIT	QTY	PRICE	AMOUNT
1	MOBILIZATION	LS	1	\$84,000.00	\$84,000
2	30-INCH D.I. WATER MAIN (OPEN CUT)	LF	94,956	\$95.00	\$9,020,820
3	30-INCH D.I. WATER MAIN (BORE)	LF	84	\$150.00	\$12,600
4	4 INCH COMBINATION AIR VALVE WITH MANHOLE	EA	7	\$12,000.00	\$84,000
5	30 INCH BUTTERFLY VALVE WITH MANHOLE	EA	7	\$13,000.00	\$91,000
6	FILTER FABRIC	LF	95,040	\$1.00	\$95,040
7	CATHODE PROTECTION	LS	1	\$250,000.00	\$250,000
8	DISINFECT WATER TRANSMISSION MAIN	LF	95,040	\$0.50	\$47,520
9	INSTALLATION CATHODIC TEST STATIONS	LS	1	\$15,000.00	\$15,000
10	TRENCH SAFETY	LF	94,956	\$1.25	\$118,695
	ESTIMATED SUB TOTAL				

MISC

ITEM NO.	ITEM DESCRIPTION	UNIT	QTY.	UNIT PRICE	AMOUNT	
1	SURVEY (1.0 %)	LS	1	\$402,000.00	\$402,000	
2	ENGINEERING (10%)	LS	1	\$4,020,000.00	\$4,020,000	
	ESTIMATED SUB TOTAL					

Leve	l of Cost Projection:	TOTAL CONSTRUCTION COST =	\$40,200,000.00
V	No Design Completed	TOTAL ENGINEERING COST =	\$4,400,000
	Preliminary Design	TOTAL=	\$44,600,000
	Final Design		
		15% CONTINGENCY=	\$6,700,000
		GRAND TOTAL =	\$51,300,000

The engineer has no control over the cost of labor, materials, or equipment, or over the Contractor's methods of determining prices, or over competitive bidding or market conditions. As a result, this opinion of probable construction cost is based on the engineer's experience and qualifications and represents our best judgment as design professionals familiar with the construction industry. The engineer cannot and does not guarantee the proposals, bids, or the construction cost will not vary from this opinion of probable cost.

Caldwell County Regional Water and Wastewater Planning Study
Regional Water Planning
Water Transmission Line Options
Prepared June 2009

Transmission Line 2

GENERAL DEVELOPMENT

ITEM				UNIT	
NO.	ITEM DESCRIPTION	UNIT	QTY	PRICE	AMOUNT
1	MOBILIZATION (10%)	LS	1	\$650,987.90	\$650,988
2	SITE PREPARATION (7%)	LS	1	\$455,691.53	\$455,692
3	SEDIMENTATION AND EROSION CONTROL (5%)	LS	1	\$325,493.95	\$325,494
4	TRAFFIC MAINTENANCE (1.0%)	LS	1	\$65,098.79	\$65,099
5	REPLACING ASPHALT PAVEMENT	SY	202	\$90.00	\$18,200
6	DRIVEWAY REPLACEMENT (AVG)	SY	1,000	\$60.00	\$60,000
7	REMOVE AND REPLACE FENCING	LF	3,168	\$50.00	\$158,400
8	INSTALLATION OF CATHODIC TEST STATIONS	LS	1	\$10,000.00	\$10,000
	ESTIMATED SUB TOTAL				

30-INCH TRANSMISSION MAIN COST

ITEM				UNIT		
NO.	ITEM DESCRIPTION	UNIT	QTY	PRICE	AMOUNT	
1	MOBILIZATION	LS	1	\$569,389.00	\$569,389	
2	12-INCH D.I. WATER MAIN (OPEN CUT)	LF	63,080	\$80.00	\$5,046,400	
3	12-INCH D.I. WATER MAIN (BORE)	LF	280	\$120.00	\$33,600	
4	4 INCH COMBINATION AIR VALVE WITH MANHOLE	EA	7	\$12,000.00	\$84,000	
5	12 INCH BUTTERFLY VALVE WITH MANHOLE	EA	7	\$13,000.00	\$91,000	
6	FILTER FABRIC	LF	63,360	\$1.00	\$63,360	
7	CATHODE PROTECTION	LS	1	\$250,000.00	\$250,000	
8	DISINFECT WATER TRANSMISSION MAIN	LF	63,360	\$0.50	\$31,680	
9	INSTALLATION CATHODIC TEST STATIONS	LS	1	\$15,000.00	\$15,000	
10	TRENCH SAFETY	LF	63,080	\$1.25	\$78,850	
_	ESTIMATED SUB TOTAL					

MISC

ITEM				UNIT	
NO.	ITEM DESCRIPTION	UNIT	QTY.	PRICE	AMOUNT
1	SURVEY (1.0 %)	LS	1	\$80,071.51	\$80,072
2	ENGINEERING (10%)	LS	1	\$800,715.12	\$800,715
	ESTIMATED SUB TOTAL				

Lev	rel of Cost Projection: No Design Completed Preliminary Design	TOTAL CONSTRUCTION COST = TOTAL ENGINEERING COST = TOTAL=	\$8,007,151.17 \$880,787 \$8,887,938
Ц	Final Design	15% CONTINGENCY= GRAND TOTAL =	\$1,333,191 \$10,221,128

Caldwell County Regional Water and Wastewater Planning Study
Regional Water Planning
Water Transmission Line Options
Prepared June 2009

Transmission Line 3

GENERAL DEVELOPMENT

ITEM				UNIT		
NO.	ITEM DESCRIPTION	UNIT	QTY	PRICE	AMOUNT	
1	MOBILIZATION (10%)	LS	1	\$400,161.90	\$400,162	
2	SITE PREPARATION (7%)	LS	1	\$280,113.33	\$280,113	
3	SEDIMENTATION AND EROSION CONTROL (5%)	LS	1	\$200,080.95	\$200,081	
4	TRAFFIC MAINTENANCE (1.0%)	LS	1	\$40,016.19	\$40,016	
5	REPLACING ASPHALT PAVEMENT	SY	156	\$90.00	\$14,000	
6	DRIVEWAY REPLACEMENT (AVG)	SY	417	\$60.00	\$25,000	
7	REMOVE AND REPLACE FENCING	LF	1,848	\$50.00	\$92,400	
8	INSTALLATION OF CATHODIC TEST STATIONS	LS	1	\$10,000.00	\$10,000	
	ESTIMATED SUB TOTAL					

30-INCH TRANSMISSION MAIN COST

ITEM				UNIT		
NO.	ITEM DESCRIPTION	UNIT	QTY	PRICE	AMOUNT	
1	MOBILIZATION	LS	1	\$350,929.00	\$350,929	
2	12-INCH D.I. WATER MAIN (OPEN CUT)	LF	36,680	\$80.00	\$2,934,400	
3	12-INCH D.I. WATER MAIN (BORE)	LF	280	\$120.00	\$33,600	
4	4 INCH COMBINATION AIR VALVE WITH MANHOLE	EA	7	\$12,000.00	\$84,000	
5	12 INCH BUTTERFLY VALVE WITH MANHOLE	EA	7	\$13,000.00	\$91,000	
6	FILTER FABRIC	LF	36,960	\$1.00	\$36,960	
7	CATHODE PROTECTION	LS	1	\$250,000.00	\$250,000	
8	DISINFECT WATER TRANSMISSION MAIN	LF	36,960	\$0.50	\$18,480	
9	INSTALLATION CATHODIC TEST STATIONS	LS	1	\$15,000.00	\$15,000	
10	TRENCH SAFETY	LF	36,680	\$1.25	\$45,850	
	ESTIMATED SUB TOTAL					

MISC

ITEM NO.	ITEM DESCRIPTION	UNIT	QTY.	UNIT PRICE	AMOUNT
1	SURVEY (1.0 %)	LS	1	\$49,219.91	\$49,220
2	ENGINEERING (10%)	LS	1	\$492,199.14	\$492,199
-	ESTIMATED SUB TOTAL				\$541,419

Level of Cost Projection: No Design Completed Preliminary Design	TOTAL CONSTRUCTION COST = TOTAL ENGINEERING COST = TOTAL=	\$4,921,991.37 \$541,419 \$5,463,410
☐ Final Design	15% CONTINGENCY= GRAND TOTAL =	\$819,512 \$6,282,922

Caldwell County Regional Water and Wastewater Planning Study
Regional Water Planning
Water Transmission Line Options
Prepared June 2009

Transmission Line 4

GENERAL DEVELOPMENT

ITEM				UNIT									
NO.	ITEM DESCRIPTION	UNIT	QTY	PRICE	AMOUNT								
1	MOBILIZATION (10%)	LS	1	\$548,305.50	\$548,306								
2	SITE PREPARATION (7%)	LS	1	\$383,813.85	\$383,814								
3	SEDIMENTATION AND EROSION CONTROL (5%)	LS	1	\$274,152.75	\$274,153								
4	TRAFFIC MAINTENANCE (1.0%)	LS	1	\$54,830.55	\$54,831								
5	REPLACING ASPHALT PAVEMENT	SY	156	\$90.00	\$14,000								
6	DRIVEWAY REPLACEMENT (AVG)	SY	417	\$60.00	\$25,000								
7	REMOVE AND REPLACE FENCING	LF	2,640	\$50.00	\$132,000								
8	INSTALLATION OF CATHODIC TEST STATIONS	LS	1	\$10,000.00	\$10,000								
		ESTIMATED SUB TOTAL											

30-INCH TRANSMISSION MAIN COST

ITEM				UNIT	
NO.	ITEM DESCRIPTION	UNIT	QTY	PRICE	AMOUNT
1	MOBILIZATION	LS	1	\$482,005.00	\$482,005
2	12-INCH D.I. WATER MAIN (OPEN CUT)	LF	52,520	\$80.00	\$4,201,600
3	12-INCH D.I. WATER MAIN (BORE)	LF	280	\$120.00	\$33,600
4	4 INCH COMBINATION AIR VALVE WITH MANHOLE	EA	7	\$12,000.00	\$84,000
5	12 INCH BUTTERFLY VALVE WITH MANHOLE	EA	7	\$13,000.00	\$91,000
6	FILTER FABRIC	LF	52,800	\$1.00	\$52,800
7	CATHODE PROTECTION	LS	1	\$250,000.00	\$250,000
8	DISINFECT WATER TRANSMISSION MAIN	LF	52,800	\$0.50	\$26,400
9	INSTALLATION CATHODIC TEST STATIONS	LS	1	\$15,000.00	\$15,000
10	TRENCH SAFETY	LF	52,520	\$1.25	\$65,650
			ESTIMATE	ED SUB TOTAL	\$5,302,055

MISC

	111100					
I	ITEM				UNIT	
ı	NO.	ITEM DESCRIPTION	UNIT	QTY.	PRICE	AMOUNT
Ī	1	SURVEY (1.0 %)	LS	1	\$67,441.58	\$67,442
I	2	ENGINEERING (10%)	LS	1	\$674,415.77	\$674,416
•				ESTIMATE	ED SUB TOTAL	\$741.857

Level of Cost Projection: No Design Completed Preliminary Design	TOTAL CONSTRUCTION COST = TOTAL ENGINEERING COST = TOTAL=	\$6,744,157.65 \$741,857 \$7,486,015
☐ Final Design	15% CONTINGENCY= GRAND TOTAL =	\$1,122,902 \$8,608,917

Caldwell County Regional Water and Wastewater Planning Study Regional Wastewater Planning Package Treatment Plants

Extended Aeration Package Treatment Plant Planning Cost Estimate in Millions of Dollars													
Population Projections		2010			2020			2030			2040		
ropulation Projections	46,308			65,057			86,902			100,000			
Wastewater Flows	4.723			6.636			8.864			10.200			
Proposed Plant Size	0.015 MGD	0.04 MGD	1.0 MGD	0.015 MGD	0.04 MGD	1.0 MGD	0.015 MGD	0.04 MGD	1.0 MGD	0.015 MGD	0.04 MGD	1.0 MGD	
Estimated Cost Per Gallon	\$10.0	\$10.0 \$7.0 \$1.3		\$10.0	\$7.0	\$1.3	\$10.0	\$7.0	\$1.3	\$10.0	\$7.0	\$1.3	
Estimated Number of Plants	Stimated Number of Plants 315 94 5		442	133	7	591	177	9	680	204	10		
Estimated Total Cost	47.23	33.06	6.14	66.36	46.45	8.63	88.64	62.05	11.52	102.00	71.40	13.26	

Sequencing Batch Reactor (SBR) Package Treatment Plant Planning Cost Estimate in Millions of Dollars												
Population Projections		2010			2020			2030		2040		
ropulation Projections	46,308			65,057			86,902			100,000		
Wastewater Flows	4.723			6.636			8.864			10.200		
Proposed Plant Size	0.01 MGD	0.20 MGD	1.0 MGD	0.01 MGD	0.20 MGD	1.0 MGD	0.01 MGD	0.20 MGD	1.0 MGD	0.01 MGD	0.20 MGD	1.0 MGD
Estimated Cost Per Gallon	\$4.50	\$4.50 \$0.70 \$0.25		\$4.50	\$0.70	\$0.25	\$4.50	\$0.70	\$0.25	\$4.50	\$0.70	\$0.25
Estimated Number of Plants	imated Number of Plants 3149 945 47 4424 1327		66	5909	1773	89	6800	2040	102			
Estimated Total Cost	21.26	3.31	1.18	29.86	4.65	1.66	39.89	6.20	2.22	45.90	7.14	2.55

Notes:

Population estimates based on this study

Estimated cost per gallon based on EPA Wastewater Technology Fact Sheet Package Plants

Caldwell County Regional Water and Wastewater Planning Study Regional Wastewater Planning Multiple Regional Treatment Facilities

	Multiple Regional Treatment Facility Planning Cost Estimate												
Service Area	Year	Population	Total Wastewate r Flow (MGD)	Percent of Flow	Total Treated Flow (MGD)	Cost Per Gallon (\$)	Plant Cost	Line Length (ft)	Pipeline Cost (\$/ft)	Total Line Cost	Total Plant Cost		
	2010	46,308	4.723	40%	1.89	\$3.75	\$7,084,500	168,289	\$125	\$21,036,125	\$28,120,625		
Lockhart	2020	65,057	6.636	40%	2.65	\$3.75	\$9,954,000	168,289	\$125	\$21,036,125	\$30,990,125		
Lockilait	2030	86,902	8.864	40%	3.55	\$3.75	\$13,296,000	168,289	\$125	\$21,036,125	\$34,332,125		
	2040	100,000	10.200	40%	4.08	\$3.75	\$15,300,000	168,289	\$125	\$21,036,125	\$36,336,125		
	2010	46,308	4.723	35%	1.65	\$3.75	\$6,198,938	160,972	\$125	\$20,121,500	\$26,320,438		
Luling	2020	65,057	6.636	35%	2.32	\$3.75	\$8,709,750	160,972	\$125	\$20,121,500	\$28,831,250		
Lumg	2030	86,902	8.864	35%	3.10	\$3.75	\$11,634,000	160,972	\$125	\$20,121,500	\$31,755,500		
	2040	100,000	10.200	35%	3.57	\$3.75	\$13,387,500	160,972	\$125	\$20,121,500	\$33,509,000		
	2010	46,308	4.723	20%	0.94	\$3.75	\$3,542,250	56,173	\$125	\$7,021,625	\$10,563,875		
Martindale	2020	65,057	6.636	20%	1.33	\$3.75	\$4,977,000	56,173	\$125	\$7,021,625	\$11,998,625		
waitiidale	2030	86,902	8.864	20%	1.77	\$3.75	\$6,648,000	56,173	\$125	\$7,021,625	\$13,669,625		
	2040	100,000	10.200	20%	2.04	\$3.75	\$7,650,000	56,173	\$125	\$7,021,625	\$14,671,625		
	2010	46,308	4.723	5%	0.24	\$3.75	\$885,563	45,676	\$125	\$5,709,500	\$6,595,063		
Peach	2020	65,057	6.636	5%	0.33	\$3.75	\$1,244,250	45,676	\$125	\$5,709,500	\$6,953,750		
Creek	2030	86,902	8.864	5%	0.44	\$3.75	\$1,662,000	45,676	\$125	\$5,709,500	\$7,371,500		
	2040	100,000	10.200	5%	0.51	\$3.75	<i>\$1,912,500</i>	45,676	\$125	\$5,709,500	\$7,622,000		

Notes:

Population estimates based on this study

Estimated cost per gallon based on EPA Wastewater Technology Fact Sheet Package Plants



Appendix N

Texas Water Development Board Comment Letter Regarding Draft Report and Response to Comments

TEXAS WATER DEVELOPMENT BOARD COMMENT LETTER DATED SEPTEMBER 28, 2009 AND KLOTZ ASSOCIATES RESPONSES TO COMMENTS



TEXAS WATER DEVELOPMENT BOARD

CDDA - Seguin

James E. Herring, *Chairman* Lewis H. McMahan, *Member* Edward G. Vaughan, *Member*

J. Kevin Ward

Executive Administrator

Jack Hunt, *Vice Chairman*Thomas Weir Labatt III, *Member*Joe M. Crutcher, *Member*

September 28, 2009

William West General Manager Guadalupe-Blanco RA 933 E. Court Street Seguin, Texas 78155

Re: Regional Facility Planning Grant Contract between the Texas Water Development Board (TWDB) and the Guadalupe-Blanco River Authority (GBRA), TWDB Contract No. 0804830843, Draft Final Report Comments

Dear Mr. West:

Staff members of the TWDB have completed a review of the draft report prepared under the above-referenced contract. ATTACHMENT I provides the comments resulting from this review. As stated in the TWDB contract, GBRA will consider incorporating draft report comments from the EXECUTIVE ADMINISTRATOR as well as other reviewers into the final report. In addition, GBRA will include a copy of the EXECUTIVE ADMINISTRATOR's draft report comments in the Final Report.

The TWDB looks forward to receiving one (1) electronic copy of the entire Final Report in Portable Document Format (PDF) and six (6) bound double-sided copies. GBRA shall also submit one (1) electronic copy of any computer programs or models, and, if applicable, an operations manual developed under the terms of this Contract.

If you have any questions concerning the contract, please contact Matt Nelson, the TWDB's designated Contract Manager for this project at (512) 936-3550.

Sincerely, Van Harker

Carolyn L. Brittin

Deputy Executive Administrator

Water Resources Planning and Information

Enclosures

c: Matt Nelson, TWDB

Our Mission

To provide leadership, planning, financial assistance, information, and education for the conservation and responsible development of water for Texas.



ATTACHMENT 1

TWDB Contract No. 0804830843

Guadalupe-Blanco River Authority

Caldwell County Regional Water and Wastewater Planning Study

TWDB Comments on Draft Final Report:

- 1. Pages with figures/exhibits are missing page numbers while the numbering of the remaining pages overlooks the exhibit pages (e.g. exhibit 11-2). Please number each report page, including figures, consecutively.
- 2. Report does not include information on existing impervious cover in the county or show the locations of existing WTPs and proposed WTPs & WWTPs as required by contract scope of work Task 1.a. Please include this information in report.
- 3. Report does not include information regarding the locations of major power lines as required by contract scope of work Task 1.c. Please include this information in report.
- 4. Page ES-3: Please note within the Executive Summary that the population and water demand projections used in the study were higher than those approved by TWDB for regional water planning purposes.
- 5. Section 7: The Caldwell County Water CCN Utility Map should be labeled 7-1, not 2-4.
- 6. Page 8-7: Report does not appear to specify whether and/or how per capita water demands varied from regional and state water planning per capita water demand estimates. Please discuss whether and/or how per capita water demands varied from TWDB approved per capita demands and whether and/or how this may have further amplified the total water demand projections used in the study considering that higher population projections (due to a higher migration rate) were also being used.
- 7. Page 12-6, Table 12-5: Please provide the basis for the costs estimates presented in the table.

- 8. Exhibit 12-1 (no page): The key to the figure is missing. Please include a key that also indicates which are planned projects.
- 9. Page 13-9, Table 13-3: Please provide the basis for the costs estimates presented in the table.
- 10. Exhibit 13-4: Figure Legend does not explain what the black-outlined orange lines indicate. Please include this symbol in the legend.
- 11. Page 14-1: The 5-page Regional Water Quality Protection Plan appears to be a standard list of common practices. Please prepare a water quality protection plan specific to Caldwell County's existing characteristics and needs.
- 12. Report does not clearly present in one place the preferred general facilities plan for regionalization of water and wastewater treatment that is required by contract scope of work, Task 6. Please present the preferred water and wastewater plan(s), more clearly in one place in the report including associated map(s), and indicate whether consensus was achieved on its selection per contract scope of work Task 6.

KLOTZ ASSOCIATES RESPONSES TO COMMENTS FROM TEXAS WATER DEVELOPMENT BOARD COMMENT LETTER DATED SEPTEMBER 28, 2009

Klotz Associates, Inc. Responses to Texas Water Development Board Comments Dated September 28, 2009

TWDB Comments on Draft Final Report:

1. Pages with figures/exhibits are missing page numbers while the numbering of the remaining pages overlooks the exhibit pages (e.g. exhibit 11-2). Please number each report page, including figures, consecutively.

Klotz Associates Response:

All Figures and Exhibits have been assigned page numbers.

2. Report does not include information on existing impervious cover in the county or show the locations of existing WTPs and proposed WTPs & WWTPs as required by contract scope of work Task 1.a. Please include this information in report.

Klotz Associates Response:

The following items have been added to the Report:

- a. Impervious Cover Exhibit 2-8
- b. Exhibit 7-1 has been revised to illustrate the locations of existing WTP
- c. Exhibit 7-2 has been added to illustrate the locations of existing WWTP
- d. Exhibit 12-1 has been revised to illustrate the locations of the proposed WTP
- e. Exhibit 13-2 has been revised to illustrate the locations of the proposed WWTF
- 3. Report does not include information regarding the locations of major power lines as required by contract scope of work Task 1.c. Please include this information in report.

Klotz Associates Response:

Exhibit 2-7 has been added to include the approximate location of the major power lines.

4. Page ES-3: Please note within the Executive Summary that the population and water demand projections used in the study were higher than those approved by TWDB for regional water planning purposes.

Klotz Associates Response:

We have noted in the Executive Summary that the population and water demands for our study are higher than the approved values used in TWDB planning studies.

5. Section 7: The Caldwell County Water CNN Utility Map should be labeled 7-1, not 2-4.

Klotz Associates Response:

The Caldwell County Water CCN Map has been labeled Exhibit 7-1, Water Production Facilities.

6. Page 8-7: Report does not appear to specify whether and/or how per capita water demands varied from regional and state water planning per capita water demand estimates. Please discuss whether and/or how per capita water demands varied from TWDB approved per capita demands and whether and/or how this may have further amplified the total water demand projections used in the study considering that higher population projections (due to a higher migration rate) were also being used.

Klotz Associates Response:

We have added a discussion to the report explaining the source of our per capita water demands and why and how they differ from TWDB values.

7. Page 12-6, Table 12-5: Please provide the basis for the costs estimates presented in the table.

Klotz Associates Response:

Basis for cost estimates presented in Table 12-5 have been added in Appendix M.

8. Exhibit 12-1 (no page): The key to the figure is missing. Please include a key that also indicates which are planned projects.

Klotz Associates Response:

A legend has been added to Exhibit 12-1 that includes planned projects.

9. Page 13-9, Table 13-3: Please provide the basis for the costs estimates presented in the table.

Klotz Associates Response:

A paragraph has been added to Section 13.7 to elaborate on the basis for the cost estimates presented in the Table 13-3.

10. Exhibit 13-4: Figure Legend does not explain what the black-outlined orange lines indicate. Please include this symbol in the legend.

Klotz Associates Response:

Exhibit 13-4 Legend has been revised to address the black-outlined orange lines.

11. Page 14-1: The 5-page Regional Water Quality Protection Plan appears to be a standard list of common practices. Please prepare a water quality protection plan specific to Caldwell County's existing characteristics and needs.

Klotz Associates Response:

A Water Quality Protection Plan for Caldwell County has been added. The Plan includes upgrading of wastewater treatment plant facilities to produce higher quality effluent; reuse of reclaimed water, use of vegetated filter strips along waterways, water quality basins to treat runoff from areas with impervious cover and periodic inspection and recertification of OSSF systems.

12. Report does not clearly present in one place the preferred general facilities plan for regionalization of water and wastewater treatment that is required by contract scope of work, Task 6. Please present the preferred water and wastewater plan(s), more clearly in one place in the report including associated map(s), and indicate whether consensus was achieved on its selection per contract scope of work Task 6.

Klotz Associates Response:

Section 16 has been added to the Report to illustrate in one place the preferred facilities plan with a discussion on consensus.