GMA 15
Pumping Scenarios

Groundwater Management Area 15

July 10, 2025



Presented by:
Steven Young Ph.D, PE, PG
Nick Lamkey PG

Agenda

- Summary of DFCs and MAGS from Third Round of Joint Planning
- INTERA Data Request for Revised Pumping
- Pumping 2015 to 2022
- Scenario 1 Simulations
- Scenario 2 Simulations

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Third Round of Joint Planning: DFCs

- The evaluation factor is three feet above or below the adopted DFC except in Goliad

- Goliad County Evaluation Factors
  - Chicot: ±17 feet
  - Evangeline: ±36 feet
  - Burkeville: ±14 feet
  - Jasper: ±7 feet

January 1, 2000 to December 31, 2080

County	Aquifer	DFC
Aransas	Gulf Coast Aquifer System	0
Bee	Gulf Coast Aquifer System	7
Calhoun	Gulf Coast Aquifer System	5
Colorado	Chicot & Evangeline	17
	Jasper	25
De Witt	Gulf Coast Aquifer System	17
Fayette	Gulf Coast Aquifer System	44
Goliad	Chicot	-4
	Evangeline	-2
	Burkeville	7
	Jasper	14
Jackson	Gulf Coast Aquifer System	15
Karnes	Gulf Coast Aquifer System	22
Lavaca	Gulf Coast Aquifer System	18
Matagorda	Chicot & Evangeline	11
Refugio	Gulf Coast Aquifer System	5
Victoria	Gulf Coast Aquifer System	5
Wharton	Chicot & Evangeline	15

INTERA

Third Round of Joint Planning: MAGS

GAM RUN 21-020 MAG:
MODELED AVAILABLE GROUNDWATER FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 15

Grayson Dowlearn, P.G.
Texas Water Development Board
Groundwater Division
Groundwater Modeling Section
512-475-1552
August 16, 2022

AFY

County	Aquifer	MAG (afy)			
		2020	2050	2070	2080
Aransas	na	na	na	na	na
Bee	CH, EV, BK, JS	8,017	8,000	8,003	7,989
Calhoun	CH, EV, BK, JS	7,611	7,611	7,611	7,611
Colorado	CH & EV	71,665	71,665	71,665	71,665
	JS	918	918	918	918
DeWitt	CH, EV, BK, JS	17,993	17,827	17,784	17,772
Fayette	CH, EV, BK, JS	7,168	8,011	8,660	8,590
Goliad	CH	418	430	436	436
	EV	4,983	5,165	5,287	5,287
	BK	425	505	559	559
	JS	250	515	690	690
Jackson		90,571	90,571	90,571	90,571
Karnes	CH, EV, BK, JS	10,694	3,399	2,952	2,949
Matagorda	CH & EV	38,892	38,892	38,892	38,892
Refugio	CH, EV, BK, JS	5,858	5,858	5,858	5,858
Wharton	CH & EV	181,446	181,446	181,446	181,446
Victoria	CH, EV, BK, JS	59,948	59,948	59,948	59,948

INTERA

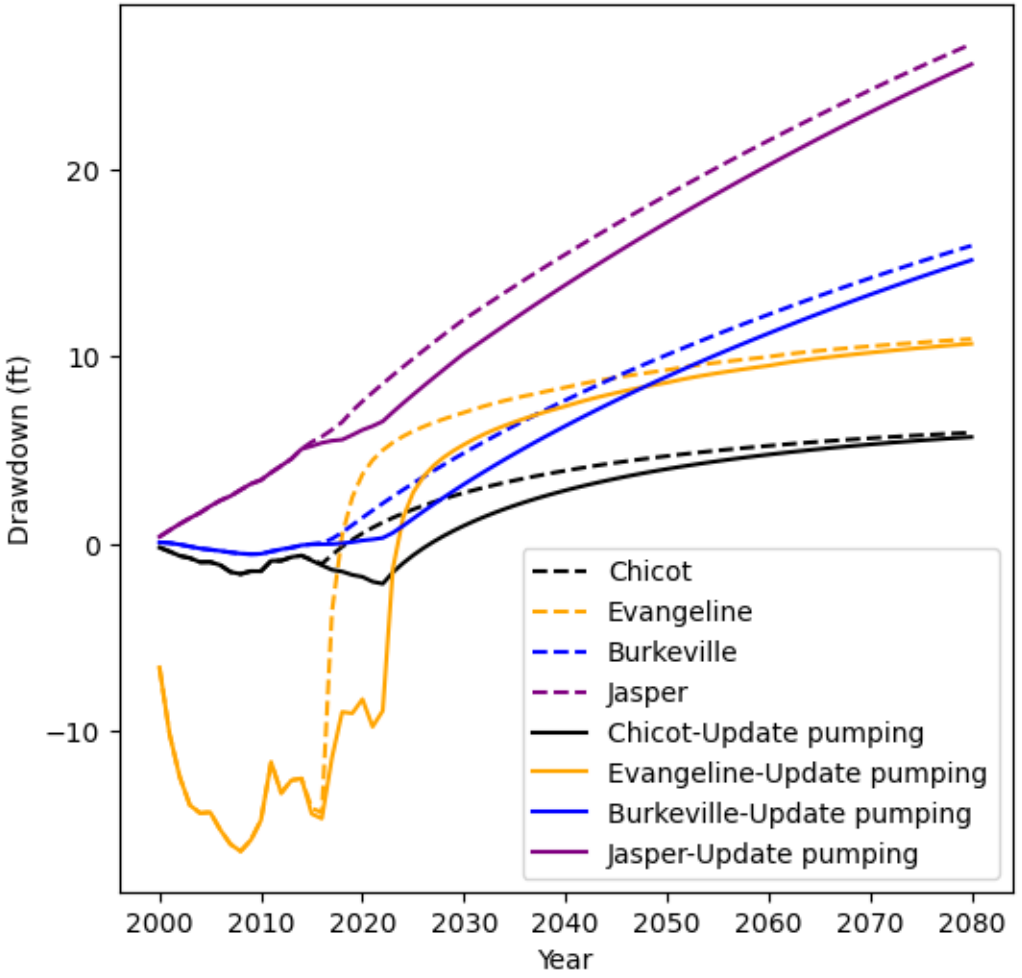
GMA 15 Pumping Adjustments: 2015 – 2022*

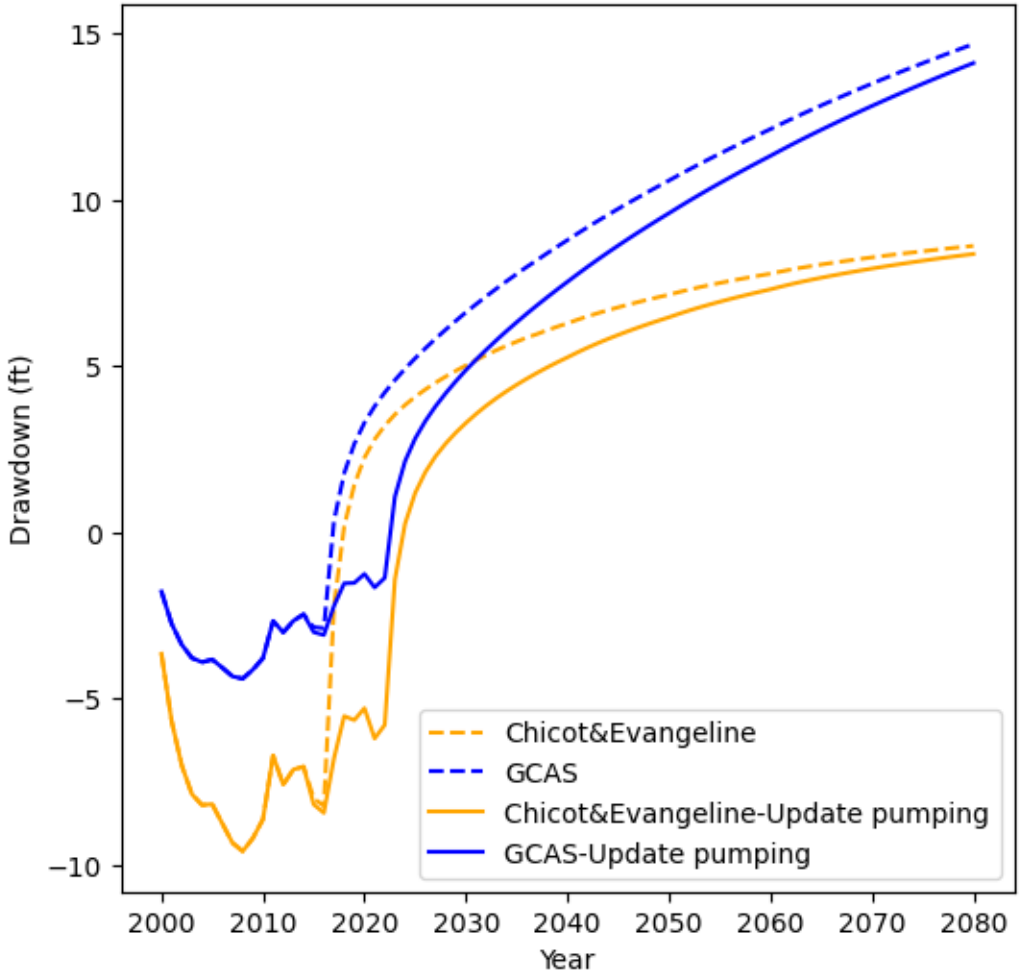
County	Year							
	2015	2016	2017	2018	2019	2020	2021	2022
Aransas	0.46	0.46	0.27	0.21	0.20	0.40	0.40	0.41
Bee	0.79	0.81	0.19	0.19	0.17	0.18	0.19	0.24
Calhoun	0.77	0.72	0.12	0.14	0.14	0.14	0.15	0.15
Colorado	0.96	0.96	0.35	0.46	0.35	0.35	0.35	0.60
De witt	0.41	0.55	0.68	0.23	0.23	0.37	0.30	0.38
Goliad	0.76		0.82	0.79	0.83	0.83	0.77	0.91
Jackson	0.99	0.99	0.60	0.67	0.68	0.64	0.61	0.70
Karnes	0.65	0.56	0.24	0.23	0.25	0.82	0.90	1.07
Lavaca	0.86	0.86	0.48	0.55	0.59	0.62	0.54	0.61
Matagorda	1.12	0.91	0.92	0.96	0.84	0.85	0.83	0.78
Refugio	0.87	0.89	0.36	0.31	0.33	0.37	0.34	0.35
Victoria	0.89	0.89	0.20	0.22	0.25	0.26	0.23	0.32
Wharton	0.94	0.95	0.64	0.71	0.59	0.68	0.44	0.47

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* Presented April 10, 2025

Drawdown Predicted by Current GAM and GAM with Pumping Updated Using TWDB Pumping through 2022





Average drawdown relative to Jan. 2000 in GMA15 Predicted by the GAM.

Requested Adjustments to Pre 2022 Pumping

- General Manager Neil Hudgins (July 2025)
- Pumping Adjustments
  - No location change
  - All pumping adjusted by the same ratios

Year	Coastal Plains GCD	Coastal Bend GCD
2005	19,981	-
2006	20,092	134,682
2007	18,369	86,777
2008	24,151	138,928
2009	39,079	177,272
2010	26,898	131,091
2011	58,652	190,759
2012	39,189	153,313
2013	43,205	163,614
2014	45,212	156,806
2015	35,341	121,100
2016	29,206	111,143
2017	28,418	111,819
2018	30,803	138,047
2019	27,214	111,820
2020	27,851	117,757
2021	27,049	83,745
2022	36,739	167,886
2023	44,826	145,887
2024	41,252	-

County	Year																			
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Matagorda	0.51	0.85	0.89	0.90	0.92	0.88	0.94	0.92	0.93	0.99	0.91	0.89	0.69	0.75	0.67	0.68	0.66	0.90	1.10	1.01
Wharton		0.98	1.07	1.01	1.01	1.01	1.01	1.01	0.98	1.00	1.00	1.00	0.62	0.76	0.62	0.65	0.46	0.93	0.80	

Data Request – Annual Pumping Data*

* Presented at GMA 15 meeting on April 10, 2025 and in INTERA letter dated April 10, 2025

Appendix A.
Format for Submission of Annual Pumping Data

For each GCD, INTERA will provide the total annual pumping from 2015 to 2022 for the Chicot Aquifer, Evangeline Aquifer , Burkeville Confining Layer, the Jasper Aquifer, and the total for four geologic units. A GCD will have the option to adjust any of the pumping amounts using one or both of following options. The GCDs may mix and match the options if it wishes to do so.

Option 1 – Annual Pumping Amount by Model Layer

To change the annual pumping amount for a model layer for a specific year, a GCD will need to submit an excel file. The excel sheet should be email to Steve Young at syoung@intera.com and to Tim Andruss at Tim.Andruss@vcgcd.org. The excel will list one change per row. Each row needs to include the following :the county, the model layer, the year, and annual pumping amount in acre-feet/year day. An example of formatted data is:

County	Model Layer	Year	amount (afy)
Victoria	Chicot	2017	20,000
Victoria	Jasper	2017	500
Victoria	Evangeline	2019	7,000

Option 2 – Annual Pumping Amount by Well

To change the annual pumping amount for a specific well for a specific year, a GCD will need to submit an excel file. The excel sheet should be email to Steve Young at syoung@intera.com and to Tim Andruss at Tim.Andruss@vcgcd.org. The excel will list one pumping amount change per row. Each row needs to include the following: county, well ID, well latitude, well longitude, model layer, and annual pumping amount in acre-feet/year day. An example of formatted data is:

County	Well ID	Latitude	Longitude	Model Layer	Year	Amount(afy)
Victoria	VC-25c	28.3247	-97.1345	Chicot	2017	470
Victoria	VC-386	29.3247	-97.7428	Chicot	2017	970
Victoria	VC-001	28.8888	-96.9879	Evangeline	2017	1,550
Victoria	VC-84	28.1275	-97.5578	Chicot	2017	260
Victoria	VC-19s	29.0002	-98.8804	Jasper	2017	120

Data Request – Well Data*

Appendix B.
Format for Submission of Well Data

For each GAM simulation, INTERA will tabulate simulated drawdown at 10-year intervals starting at the year 2000 and ending in the year 2080 for every well submitted by a GCD. In addition, INERA will generate a hydrograph of the simulated water level for up to 200 wells submitted by a GCD. The list of wells needs to be listed in a excel file. The excel file should be email to Steve Young at syoung@intera.com and to Tim Andruss at Tim.Andruss@vcgcd.org. The excel file will list one well per row. . Each row needs to include the following: county, well ID, well latitude, well longitude, and model layer. An example of formatted data is:

County	Well ID	Latitude	Longitude	Model Layer
Victoria	VC-123	28.3247	-97.1345	Chicot
Victoria	VC-009	28.6734	-98.2222	Jasper
Victoria	VC-184	27.9075	-97.1987	Evangeline
Victoria	VC-349	28.3337	-97.7865	Evangeline
Victoria	VC-054	28.3247	-97.4456	Chicot

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* Presented at GMA 15 meeting on April 10, 2025 and in INTERA letter dated April 10, 2025

Response to INTERA Data Request

- No Change to Pumping and DFC
  - Live Oak GCD, Bee County GCD, Goliad County GCD, CBGCD,
  - Victoria County GCD (Scenario 1)

    a·condition·to·not·exceed·an·average·drawdown·of·5·feet·in·the·Gulf·Coast·Aquifer,·+/-3·feet,·at·the·end·of·year·2080·evaluated·using·the·previous·pumping·distribution·used·to·develop·the·DFC··¶
  - Calhoun County GCD (Scenario 1)

    a condition to not exceed an average drawdown of 5 feet in the Gulf Coast Aquifer, +/-3 feet, at the end of year 2080 evaluated using the previous pumping distribution used to develop the DFC for Calhoun County unchanged.
  - Refugio County GCD (Scenario 1)

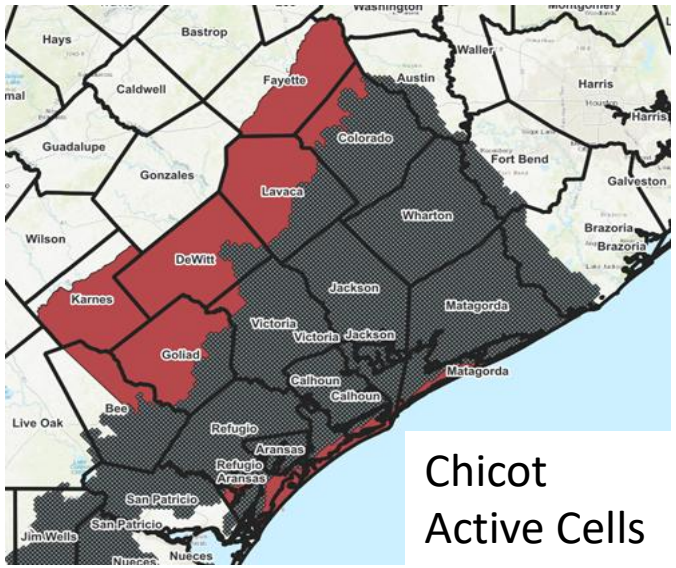
    a·condition·to·not·exceed·an·average·drawdown·of·5·feet·in·the·Gulf·Coast·Aquifer,·+/-3·feet,·at·the·end·of·year·2080·evaluated·using·the·previous·pumping·distribution·¶
- Change Pumping and DFC
  - Texana GCD (Scenario 1)

    ·a·condition·to·not·exceed·an·average·drawdown·of·**10·feet**·in·the·Gulf·Coast·Aquifer·at·the·end·of·year·2080·with·the·previous·pumping·distribution·used·to·develop·the·DFC·reduced·by·33%.¶
  - Coastal Plains GCD

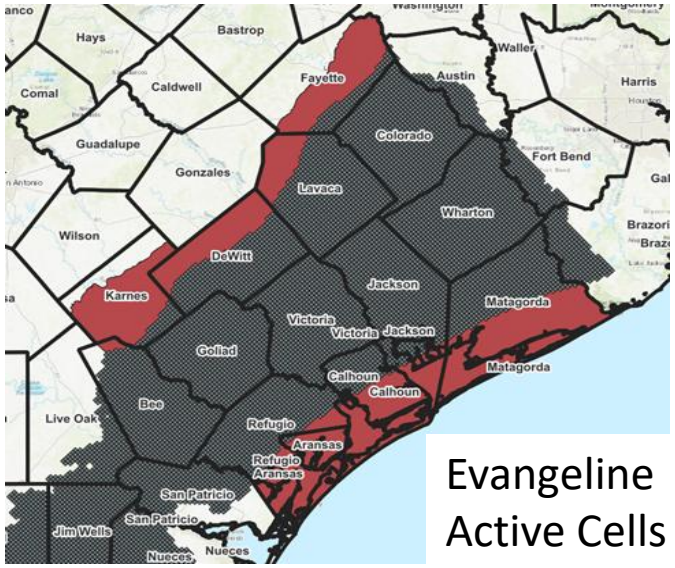
    The Coastal Plains GCD DFC is currently at 11 ….would like to see this increased to 15 ft.

Limitation of GAM Regard Developing DFCs

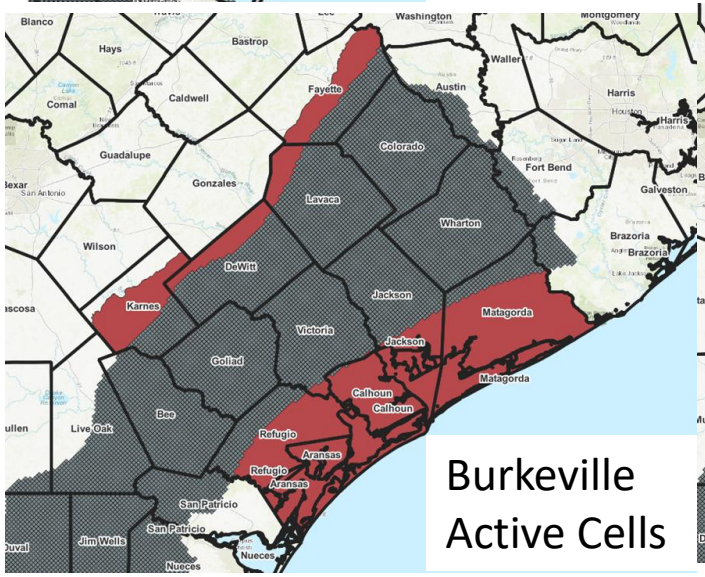
- Jasper is totally absent in four counties
- Jasper partly absent in five counties
- Pumping Effects from GMA 14 are essentially ignored
- GMA 13 GAM coverage should include 1 to 2 counties into GMA 14
- Recently updated GMA 14 GULF 2023 extend two counties into GMA 15 to Victoria County



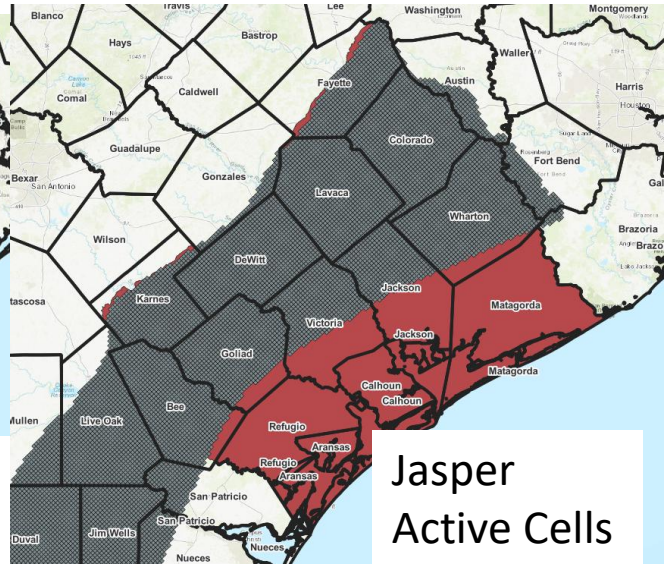
Chicot
Active Cells



Evangeline
Active Cells



Burkeville
Active Cells



Jasper
Active Cells

Challenges with Achieving DFCs in Matagorda County & Jackson County

- Matagorda County Desires Increase DFCs
  - GMA 15 GAM does not account for the contribution from GMA 14 production on drawdown in Matagorda County
  - Matagorda County DFC is insensitive to increasing Brazoria County pumping by 50%
  - Matagorda County DFC is sensitive to decreasing Jackson County pumping by 33%
- INTERA investigated numerous combination with GAM 15 pumping with no success
- Options for achieving Coastal Plains GCD DFC
  - Significantly increase pumping in Brazoria County
  - Increase evaluation factors above 3 ft

Response to INTERA Data Request

Change in Pumping within GMA 15

County	Aquifer	Pumping	
		MAG	Revised
Jackson	Chicot	66,168	66,168
Jackson	Evangeline	24,553	16,450
Matagorda	Chicot	33,790	33,790
Matagorda	Evangeline	7,121	13,103

Change in Pumping within GMA 15

Pumping in Chicot and Evangeline aquifers in Brazoria County significantly increased

County	Aquifer	DFC
Aransas	Gulf Coast Aquifer System	0
Bee	Gulf Coast Aquifer System	7
Calhoun	Gulf Coast Aquifer System	5
Colorado	Chicot & Evangeline	17
	Jasper	25
De Witt	Gulf Coast Aquifer System	17
Fayette	Gulf Coast Aquifer System	44
Goliad	Chicot	-4
	Evangeline	-2
	Burkeville	7
	Jasper	14
Jackson	Gulf Coast Aquifer System	15
Karnes	Gulf Coast Aquifer System	22
Lavaca	Gulf Coast Aquifer System	18
Matagorda	Chicot & Evangeline	11
Refugio	Gulf Coast Aquifer System	5
Victoria	Gulf Coast Aquifer System	5
Wharton	Chicot & Evangeline	15

Predicted DFC (Jan 2000 – Dec 2080)

County	Aquifer	DFC 2080
Aransas	Gulf Coast Aquifer System	0
Bee	Gulf Coast Aquifer System	7
Calhoun	Gulf Coast Aquifer System	5
Colorado	Chicot & Evangeline	17
	Jasper	25
DeWitt	Gulf Coast Aquifer System	17
Fayette	Gulf Coast Aquifer System	44
Goliad	Chicot	-4
	Evangeline	-2
	Burkeville	7
	Jasper	14
Jackson	Gulf Coast Aquifer System	**10**
Karnes	Gulf Coast Aquifer System	22
Lavaca	Gulf Coast Aquifer System	18
Matagorda	Chicot & Evangeline	**15**
Refugio	Gulf Coast Aquifer System	11
Wharton	Chicot & Evangeline	15
Victoria	Gulf Coast Aquifer System	5

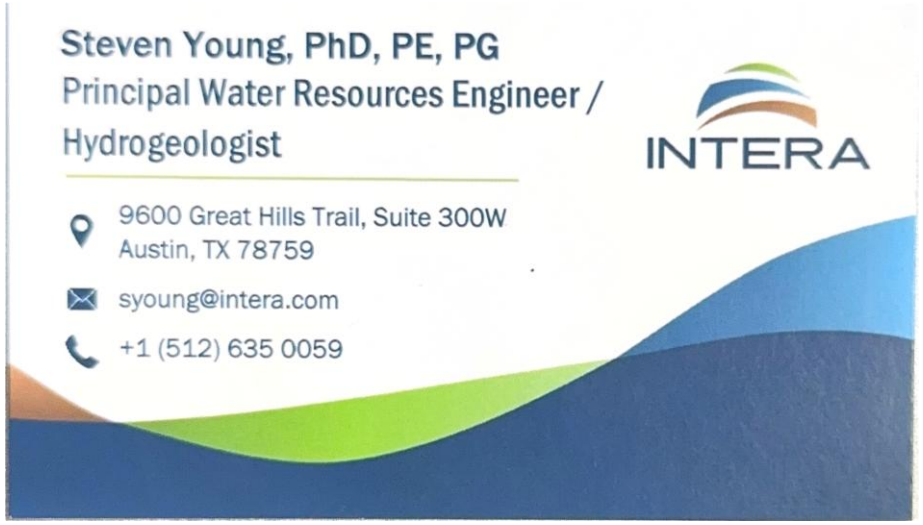
***Same Evaluation Factors as Those Used in Last Planning Period with Rounding to Nearest Integer**

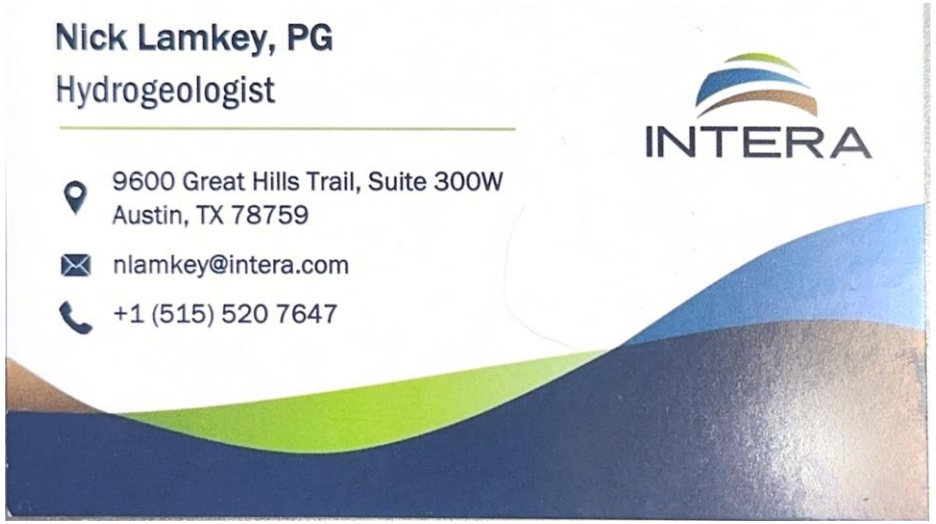
Response to INTERA Data Request (Scenario 2)

- INTERA Investigations did not Find a Path for Success any GCD Request

- Scenario 2 Adds Brackish Water Pumping to Scenario 1
  - Calhoun County GCD (Scenario 2)
    - a condition to not exceed an average drawdown of 20 feet in the Burkeville and Jasper Aquifers, combined,+/- 3 feet, at the end of year 2080 evaluated using:
    - an additional 40,000 acre-feet per year in the Burkeville and Jasper Aquifers in Calhoun County.
  - Refugio County GCD (Scenario 2)
    - a condition to not exceed an average drawdown of 20 feet in the Burkeville and Jasper Aquifers, combined,+/- 3 feet, at the end of year 2080 evaluated using:
    - an additional 40,000 acre-feet per year in the Burkeville and Jasper Aquifers in Refugio County.
  - Victoria County GCD (Scenario 2)
    - a condition to not exceed an average drawdown of 20 feet in the Burkeville and Jasper Aquifers, combined,+/- 3 feet, at the end of year 2080 evaluated using:
    - an additional 40,000 acre-feet per year in the Burkeville and Jasper Aquifers in Victoria County.
  - Texana GCD(Scenario 2)
    - a condition to not exceed an average drawdown of 20 feet in the Burkeville and Jasper Aquifers, combined,+/- 3 feet, at the end of year 2080 evaluated using:
    - an additional 40,000 acre-feet per year in the Burkeville and Jasper Aquifers in Jackson County.

Questions?


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