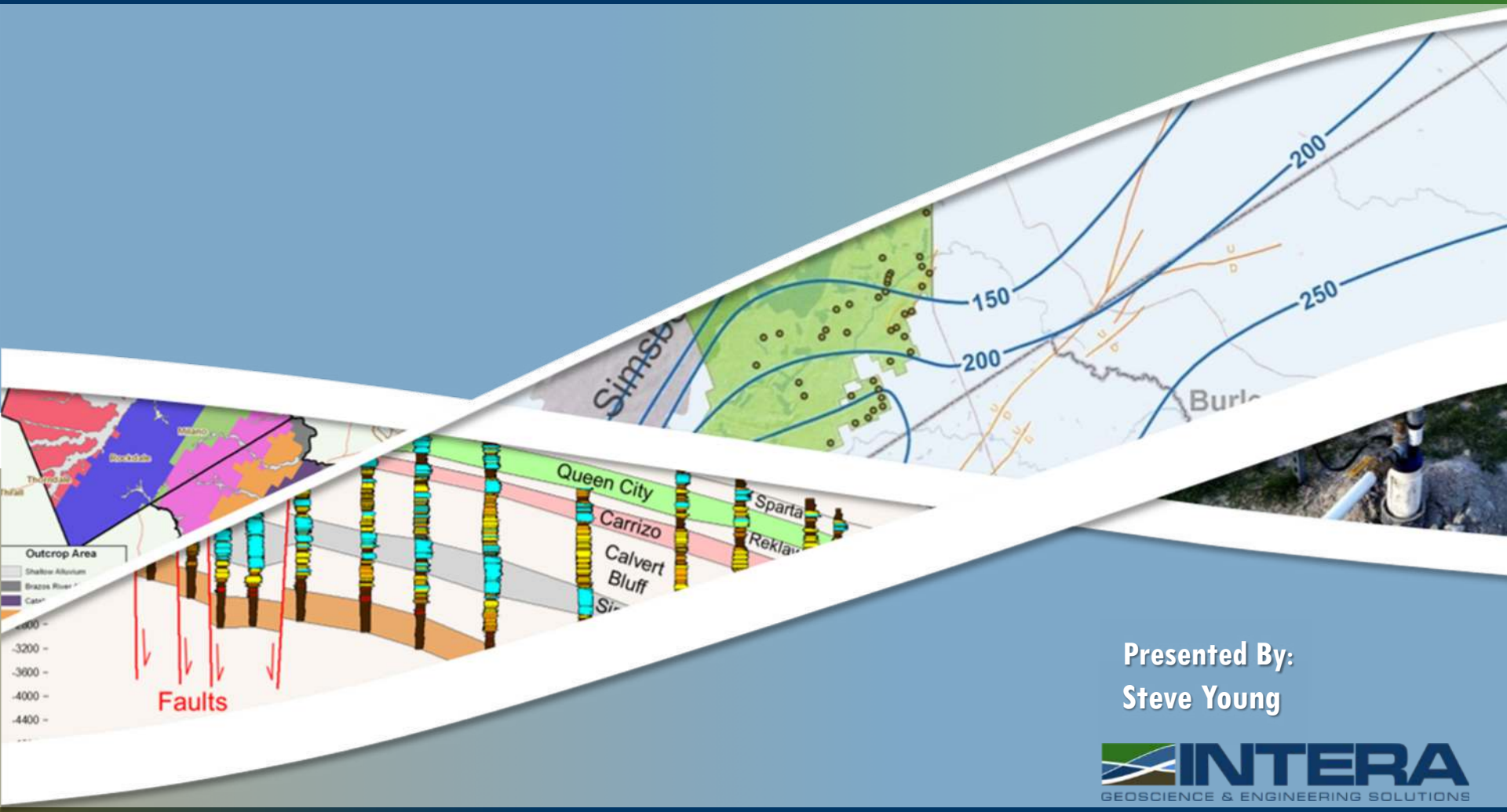
PRESENTATION TO GMA-12:
POSGCD Groundwater Monitoring



Presented By:
Steve Young

INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS

May 11, 2018

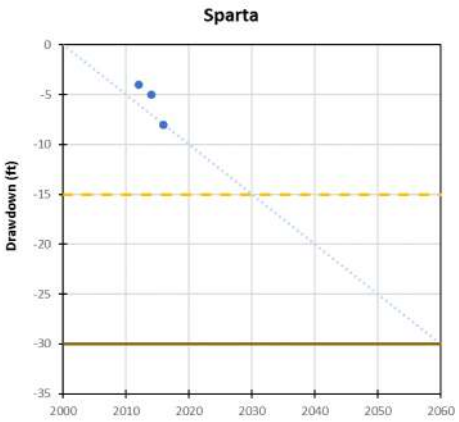
Groundwater Monitoring

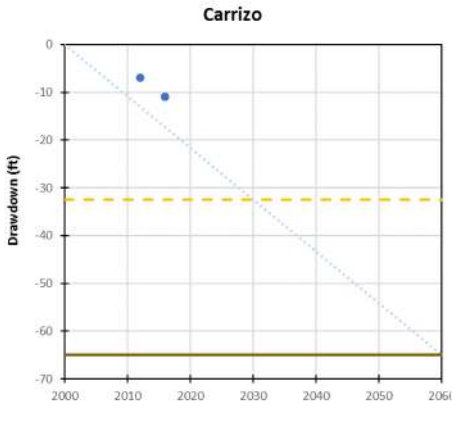
- Compliance with Desired Future Conditions
- Compliance with Protective Drawdown Limits
- Groundwater Guidance Document for Evaluating Compliance

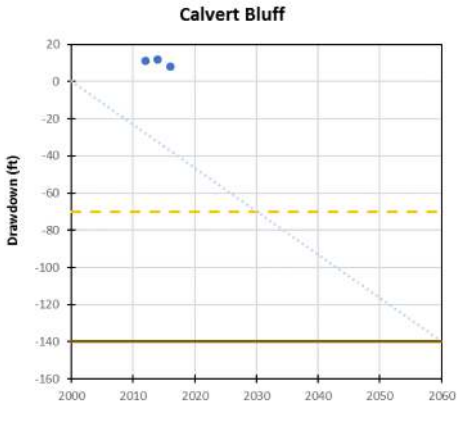
Compliance with Desired Future Conditions

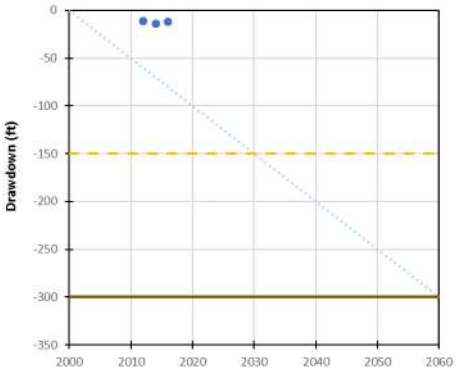
Aquifer	Zone	DFC	Drawdown from 2000 to 2012			Drawdown from 2000 to 2014			Drawdown from 2000 to 2016		
			# of Wells	**Calculated Drawdown**	Percent of DFC	# of Wells	**Calculated Drawdown**	Percent of DFC	# of Wells	**Calculated Drawdown**	Percent of DFC
Sparta	Total	**30**	3	**4**	12%	8	**5**	15%	6	**8**	27%
Queen City	Total	**30**	5	**3**	10%	9	**3**	11%	7	**0.5**	2%
Carrizo	Total	**65**	1	**7**	10%	1	**--**	--	2	**11**	17%
Calvert Bluff (Upper Wilcox)	Total	**140**	11	**-11**	-8%	16	**-12**	-8%	15	**-8**	-6%
Simsboro (Middle Wilcox)	Total	**300**	14	**11**	4%	29	**14**	5%	29	**12**	4%
Hooper (Lower Wilcox)	Total	**180**	5	**7**	4%	5	**8**	5%	5	**9**	5%
Yegua Jackson	Total	**100**	1	**16**	16%	8	**17**	17%	5	**29**	29%
Brazos River Alluvium	Burleson	**6**	--	**--**	--	--	**--**	--	--	**--**	--
	Milam	**5**	--	**--**	--	--	**--**	--	--	**--**	--

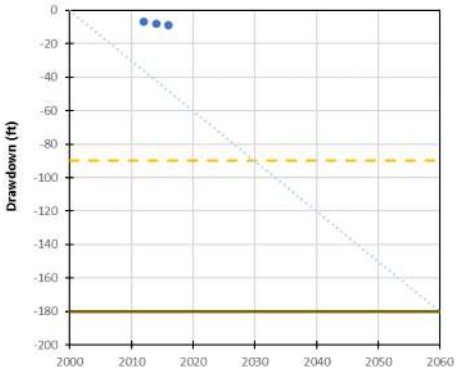
Compliance with Shallow Zone Protective Water Levels

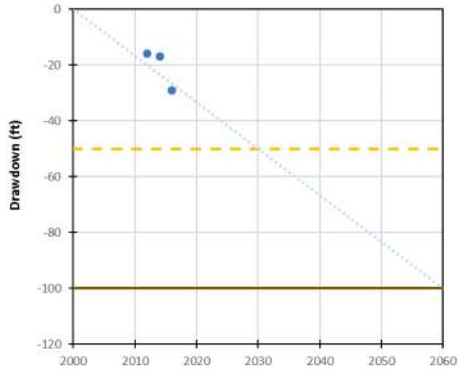


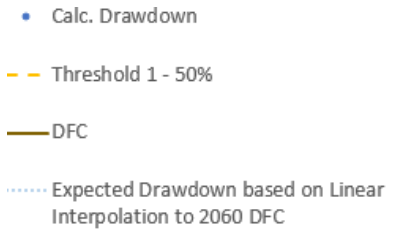












INTERA GEOSCIENCE & ENGINEERING SOLUTIONS

DFC Compliance Methodology

Step #1

Step #2

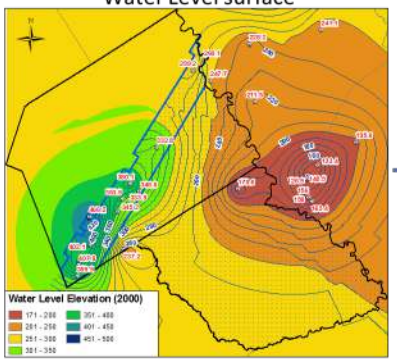
1999 | **2000** | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | **2012** | 2013 | 2014 | **2015** | 2016 | 2017

Average Water Level For 2000

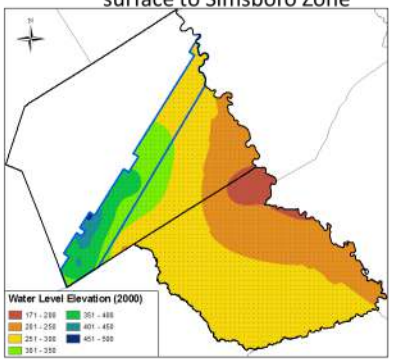
Average Water Level for 2012

Average Water Level for 2015

Step #3a Interpolate Baseline Simsboro Water Level surface

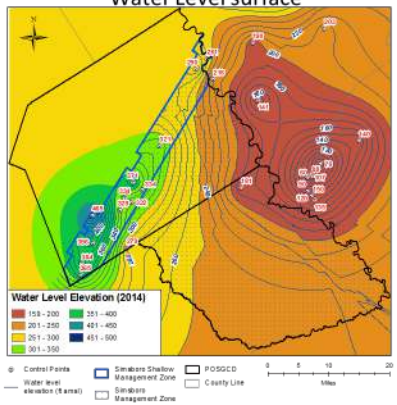


Step #4a Clip Baseline Water Level surface to Simsboro Zone

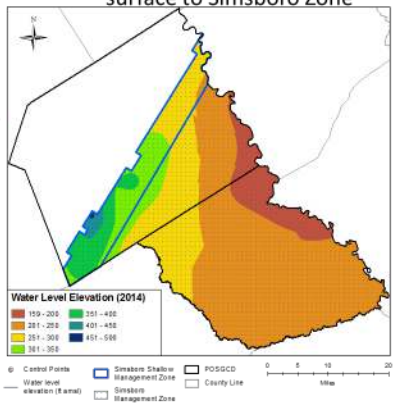


Step #5a : Calculate Average *Baseline* Simsboro Water Level from clipped surface

Step #3b Interpolate Current Simsboro Water Level surface



Step #4b Clip Current Water Level surface to Simsboro Zone

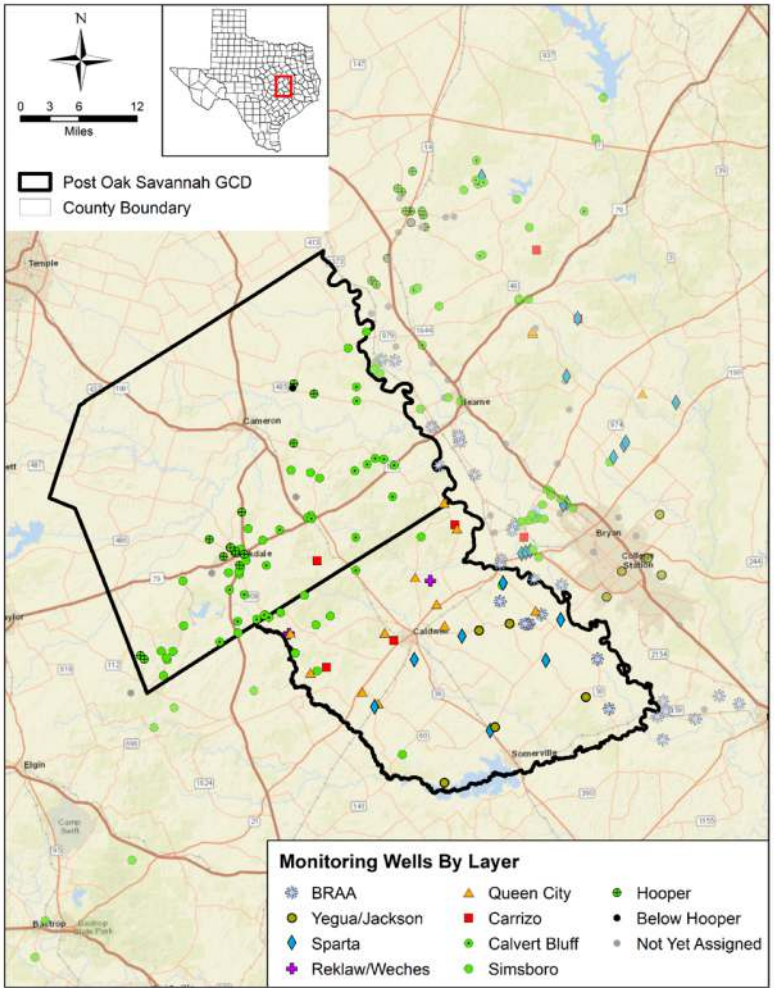


Step #5b : Calculate Average *Current* Simsboro Water Level from clipped surface

Step #6:
Drawdown = *Baseline – Current Water Level*

INTERA GEOSCIENCE & ENGINEERING SOLUTIONS

Comparison of Well Pairs for 2000-2016 Interval and 2010-2016 Interval

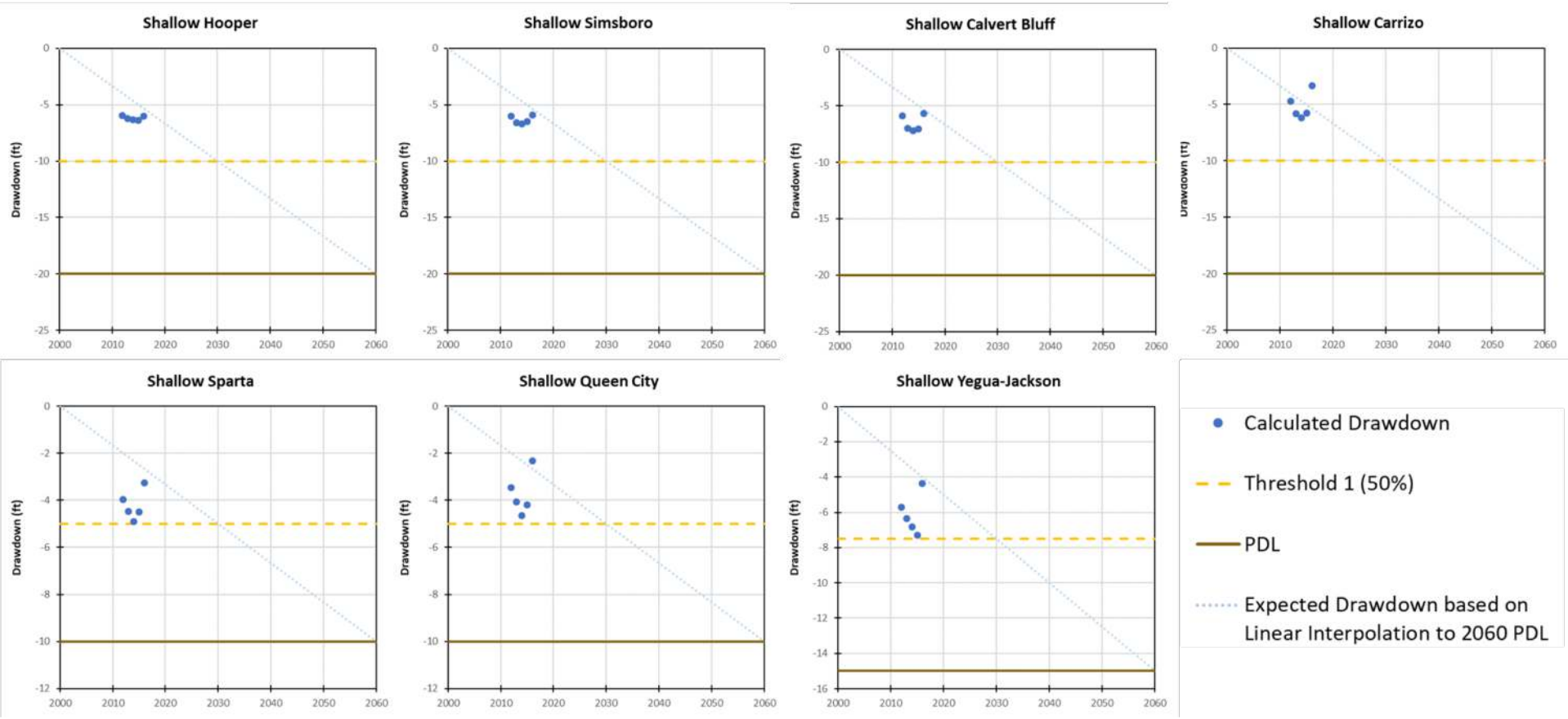


Aquifer	Zone	DFC	Drawdown from 2000 to 2016	Drawdown from 2010 to 2016
			# of Wells	# of Wells
Sparta	Total	**30**	6	18
Queen City	Total	**30**	7	15
Carrizo	Total	**65**	2	5
Calvert Bluff (Upper Wilcox)	Total	**140**	15	25
Simsboro (Middle Wilcox)	Total	**300**	29	60
Hooper (Lower Wilcox)	Total	**180**	5	21
Yegua Jackson	Total	**100**	5	5

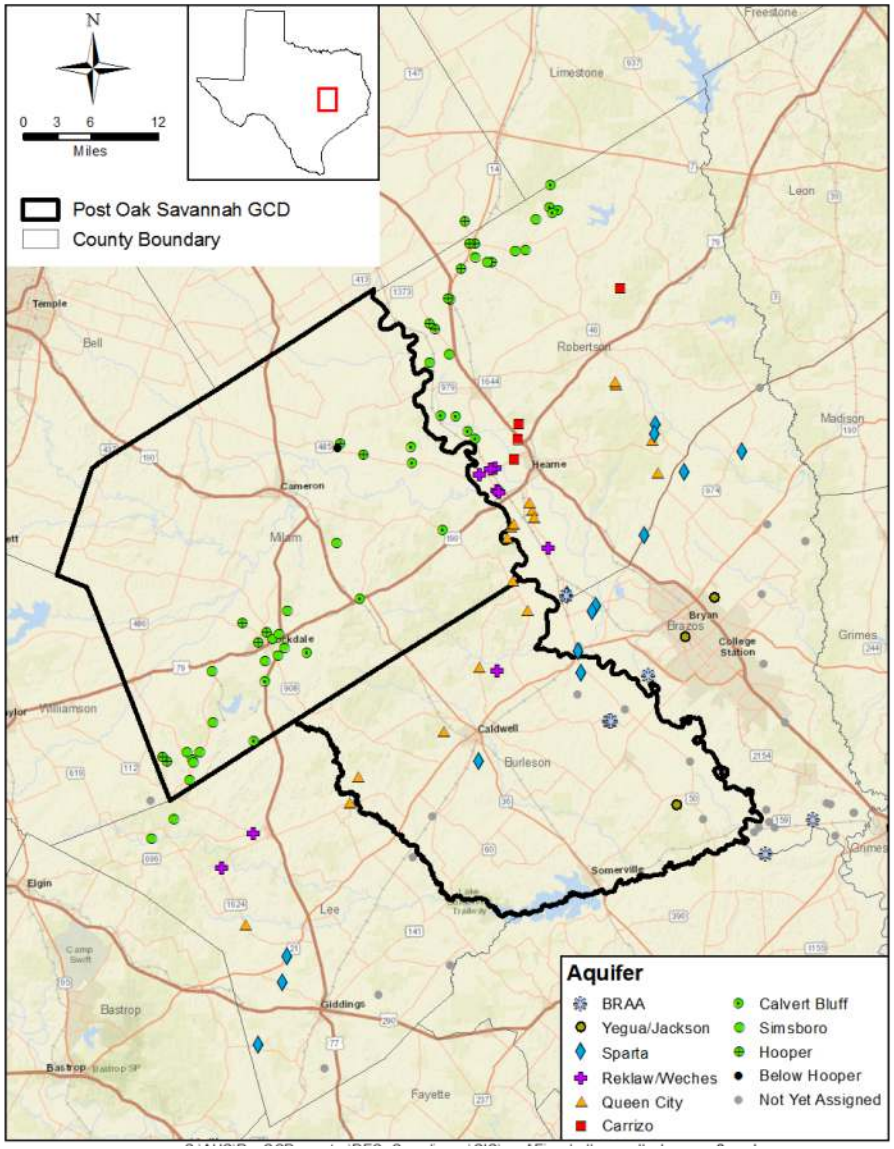
Compliance with POSGCD Shallow Protective Drawdown Limit (PDLs)(January 2018)

Shallow Management Zone	PDL	Drawdown from 2000 to 2012		Drawdown from 2000 to 2013		Drawdown from 2000 to 2014		Drawdown from 2000 to 2015*		Drawdown from 2000 to 2016*	
		Calculated Drawdown	*Percent of PDL*	*Calculated Drawdown*	*Percent of PDL*	*Calculated Drawdown*	*Percent of PDL*	*Calculated Drawdown*	*Percent of PDL*	*Calculated Drawdown*	*Percent of PDL*
Yegua Jackson	15	5.7	**38%**	6.4	**42%**	6.8	**46%**	7.3	**49%**	4.4	**29%**
Sparta	10	4.0	**40%**	4.5	**45%**	4.9	**49%**	4.5	**45%**	3.3	**33%**
Queen City	10	3.4	**34%**	4.1	**41%**	4.6	**46%**	4.2	**42%**	2.3	**23%**
Carrizo	20	4.7	**23%**	5.8	**29%**	6.2	**31%**	5.8	**29%**	3.4	**17%**
Calvert Bluff (Upper Wilcox)	20	5.9	**29%**	7.0	**35%**	7.2	**36%**	7.0	**35%**	5.7	**28%**
Simsboro (Middle Wilcox)	20	6.0	**30%**	6.6	**33%**	6.7	**33%**	6.5	**33%**	5.9	**30%**
Hooper (Lower Wilcox)	20	6.0	**30%**	6.2	**31%**	6.3	**32%**	6.4	**32%**	6.0	**30%**

Compliance with POSGCD Shallow PDLs (January 2018)

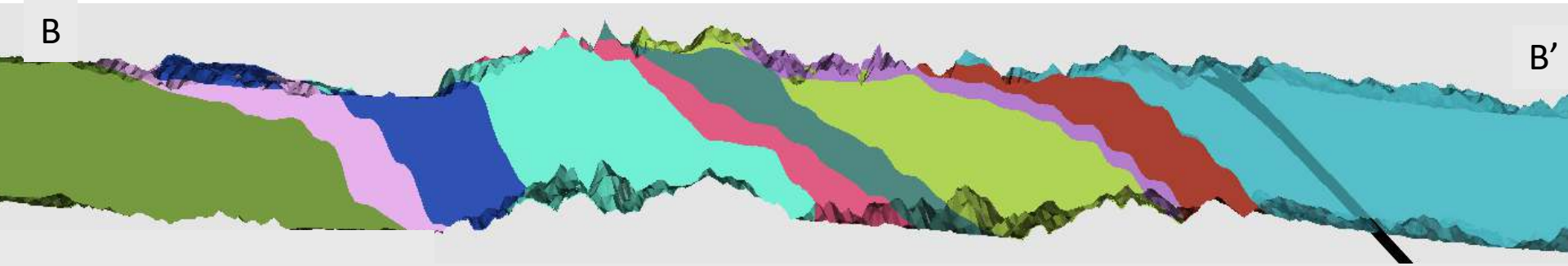


Location of Wells for 400-ft Zone

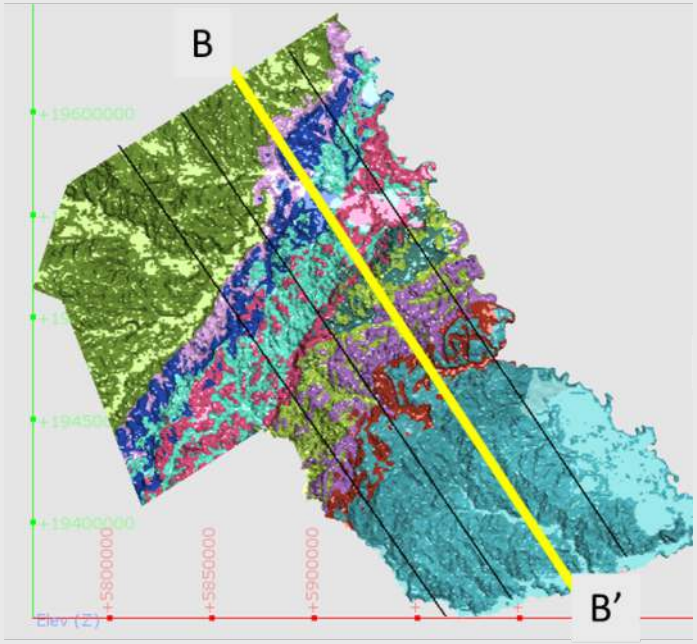


Aquifer	POSGCD wells	with outside Wells
Hooper	3	3
Simsboro	9	10
Calvert Bluff	3	5
Carrizo	0	0
Queen City	4	7
Sparta	1	5
Yegua-Jackson	1	1

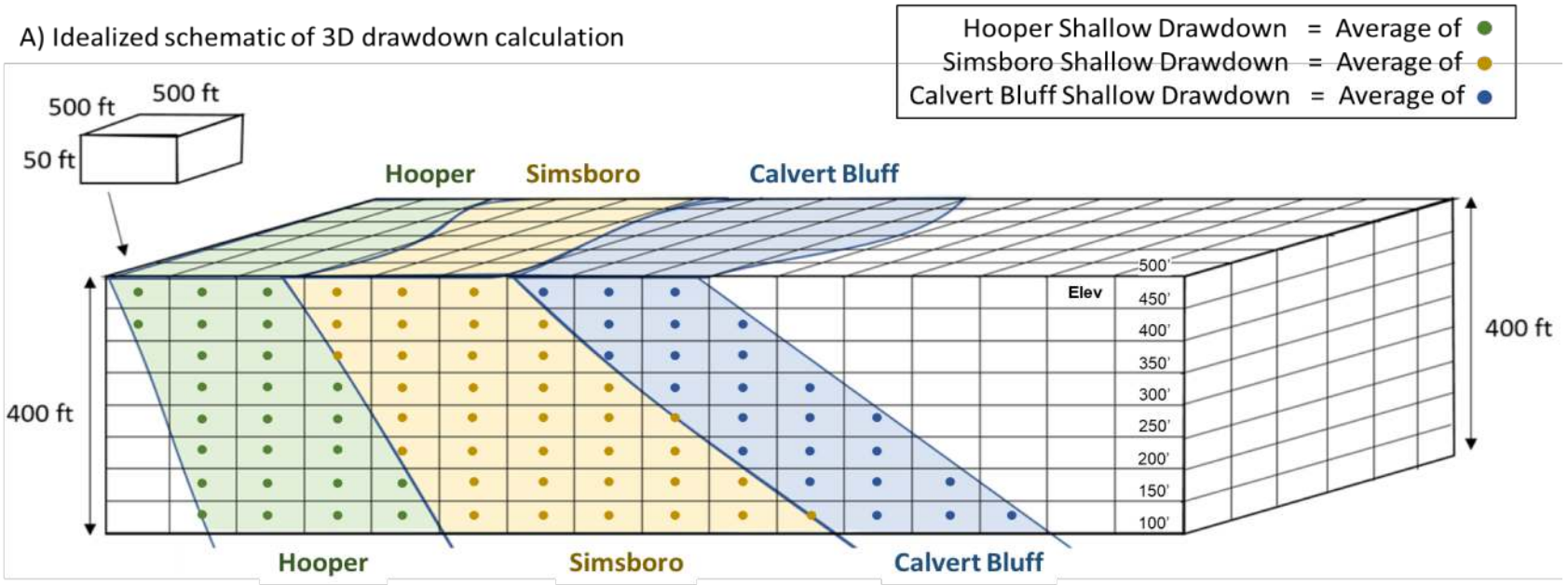
400-ft Thick Vertical Cross Section B-B’

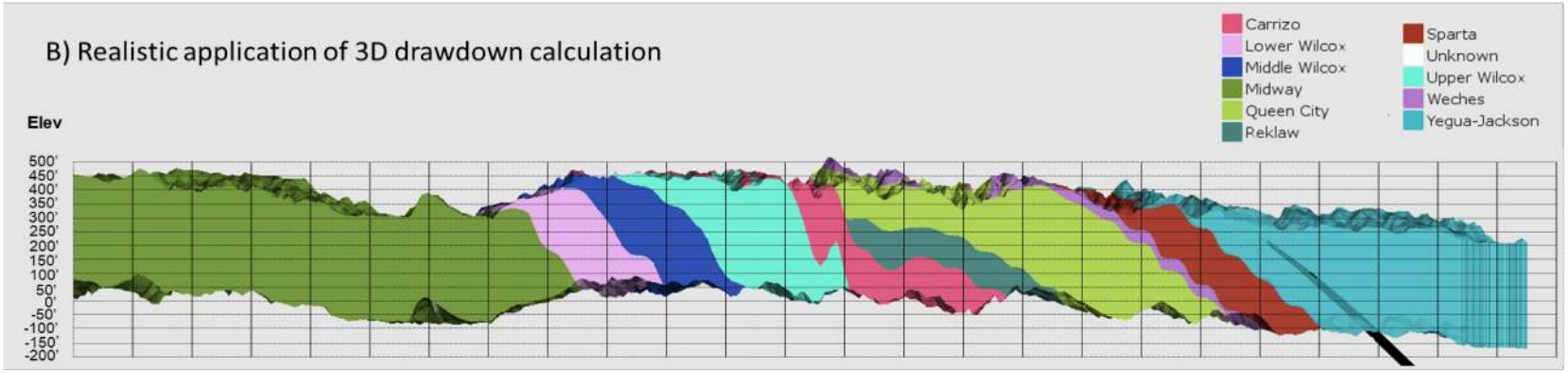


- Carrizo
- Lower Wilcox
- Middle Wilcox
- Midway
- Queen City
- Reklaw
- Sparta
- Unknown
- Upper Wilcox
- Weches
- Yegua-Jackson



Conceptualization of Three-Dimensional Approach for Averaging Water Levels





POSGCD Draft Guidance Document

Draft: Post Oak Savannah Guidance Document for Evaluating Compliance with Desired Future Conditions and Protective Drawdown Limits

Prepared for:

Post Oak Savannah Groundwater Conservation District
310 E Ave C
Milano, TX 76556

Prepared by:

INTERA Incorporated
1812 Centre Creek Drive
Suite 300
Austin, TX 78660
512-425-2000

January 2018

Version 2.0

TABLE OF CONTENTS

LIST OF FIGURES