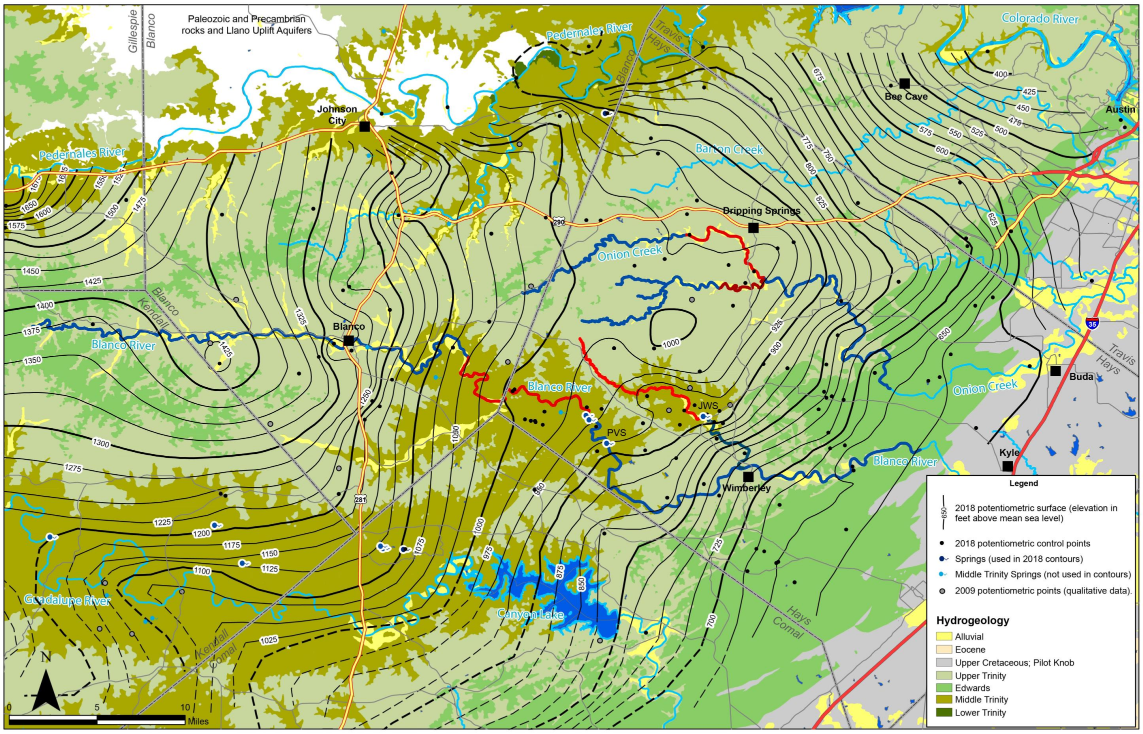
Barton Springs
Edwards Aquifer
CONSERVATION DISTRICT

MARCH 2018 POTENTIOMETRIC MAP OF THE MIDDLE TRINITY AQUIFER, CENTRAL TEXAS



BSEACD Report of Investigations 2019-0109
January 2019

Barton Springs/Edwards Aquifer Conservation District
1124 Regal Row
Austin, Texas

Ron Fieseler (standing) and Brian Hunt measuring a water level at Arnosky Farms in Blanco County.

Disclaimer
All of the information provided in this report is believed to be accurate and reliable; however, the Barton Springs/Edwards Aquifer Conservation District and the report's authors assume no liability for any errors or for the use of the information provided.

Cover. March 2018 potentiometric map of the Middle Trinity Aquifer, central Texas.

MARCH 2018 POTENTIOMETRIC MAP OF THE MIDDLE TRINITY AQUIFER, CENTRAL TEXAS

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MARCH 2018 POTENTIOMETRIC MAP OF THE MIDDLE TRINITY AQUIFER, CENTRAL TEXAS

INTRODUCTION

The Middle Trinity Aquifer is the primary groundwater resource for the central and western portions of Hays County. Groundwater levels and potentiometric surface maps provide critical information about the hydrologic relationships of recharge, discharge, and storage within an aquifer, and the direction of groundwater flow.

This report provides a potentiometric map of the Middle Trinity Aquifer for March 2018 and documents the data used to generate the map. The purpose of the report is to provide potentiometric data for future hydrogeologic investigations and evaluations of water resources. The potentiometric map and data will be useful for computer modeling, sustainable yield determinations, aquifer characterization, and resource protection.

BACKGROUND

Hydrogeologic Setting

The study area is primarily Hays County with portions of Travis, Comal, and Blanco counties spanning the Texas Hill Country (HC) and the Balcones Fault Zone (Escarpment) physiographic provinces characterized by faulting (**Figure 1**). A detailed description of the background hydrogeology is beyond the scope of this report and the reader is referred to Wierman et al. (2010); Hunt et al. (2017), and Smith et al. (2018) for hydrogeologic background information.

The data collected in this report is from wells and springs of the Middle Trinity Aquifer, which is composed of Lower Cretaceous carbonate units (**Figure 2**). The Middle Trinity Aquifer is composed of, from stratigraphically highest to lowest, the Lower Glen Rose, Hensel, and Cow Creek formations. The Hammett Shale is a regional confining unit that underlies the Middle Trinity Aquifer and separates it from the underlying Lower Trinity Aquifer. The lower Trinity Aquifer is composed of the Sligo and Hosston formations.

Overlying the Middle Trinity Aquifer is the Upper Glen Rose formation that is also considered the Upper Trinity Aquifer. Argillaceous and evaporite-rich sediments between the Middle and Upper Trinity aquifers provide hydrologic isolation between these two systems. Stratigraphically above the Upper Trinity Aquifer is the Edwards Aquifer and associated units, which are in turn overlain and confined by Upper Cretaceous limestones and clays (**Figure 2)**. Recent studies have demonstrated that the upper-most 100-150 ft of the Upper Glen Rose is in hydrologic communication with the Edwards Aquifer in the Balcones Fault Zone (Wong et al., 2014).

Figure 3 shows the structure contour of the top of the Cow Creek formation throughout the study area and is representative of the structural influence on the Middle Trinity Aquifer as a whole. The units dip to the east in most of Hays and Travis Counties, while the units dip more to the southeast in Comal and Kendall Counties. This general change in structural dip could be the result of the influence of the San Marcos Arch.

In the eastern portion of the study area the Balcones Fault Zone (BFZ) dramatically changes the structural gradient and the dip direction in some cases. The en-echelon faulting produces relay-ramp structures that provide lateral continuity of the geologic units from the HC into the BFZ (**Figure 3**).

Accordingly, the Middle Trinity Aquifer system in this area can be characterized as two interconnected aquifer zones: 1) the Hill Country (HC) Middle Trinity to the west, and 2) the Balcones Fault Zone (BFZ) Middle Trinity to the east (Hunt et al., 2017b).

The HC Middle Trinity Aquifer units are variably exposed and is characterized by losing and gaining streams, springs, and karst features. Geochemistry varies from fresh to locally brackish (> 1000 mg/L TDS) with matrix, fracture, and karstic porosity and permeability possible. Groundwater ages vary from modern or young (tritium present, 50-100% modern carbon) to old (no tritium; <50% modern carbon) (Hunt et al., 2017b). Relay-ramp structures provide lateral geologic and hydrologic continuity from the HC Middle Trinity into the BFZ Middle Trinity (Hunt et al., 2015). The BFZ Middle Trinity is deeply confined and dominated by matrix and fracture porosity and permeability. Geochemistry is commonly brackish and dominated by evaporite mineralogy and older groundwater. The natural discharge areas from this system are unknown (Hunt et al., 2017b; Smith et al., 2018). **Figure 4** presents a schematic conceptual model of the Middle Trinity Aquifer in the study area.

Previous Work

Very few regional synoptic Middle Trinity Aquifer potentiometric maps exist in the literature for the study area. A potentiometric map representing conditions during 1975 was produced by Mace et al., 2000 for the purposes of model calibration. Bush *et al*. (1993) published a regional potentiometric map. In March 2009 a regional synoptic water-level map of the Middle Trinity was produced by Hunt et al., 2010. The 2009 synoptic potentiometric map was very similar to the 1975 map in the overall geometry of the contours and gradient. A map by Watson et al., 2014 produced a potentiometric map around the Jacob’s Well area in central Hays County. That map provides more detail around JWS and the area that transitions from the HC to the BFZ Middle Trinity Aquifer.

Hydrologic Conditions

This study occurred as the region was experiencing a moderate (meteorological) drought as defined by the US Drought Monitor (**Figures 5 and 6**). However, the groundwater conservation districts of central Texas were in non-drought status during this study. This is in contrast to the conditions during the previous 2009 synoptic map (Hunt et al., 2010) when the area was under “extreme” to “exceptional” (meteorological) drought according to the U.S. Drought Monitor (**Figures 5 and 6**).

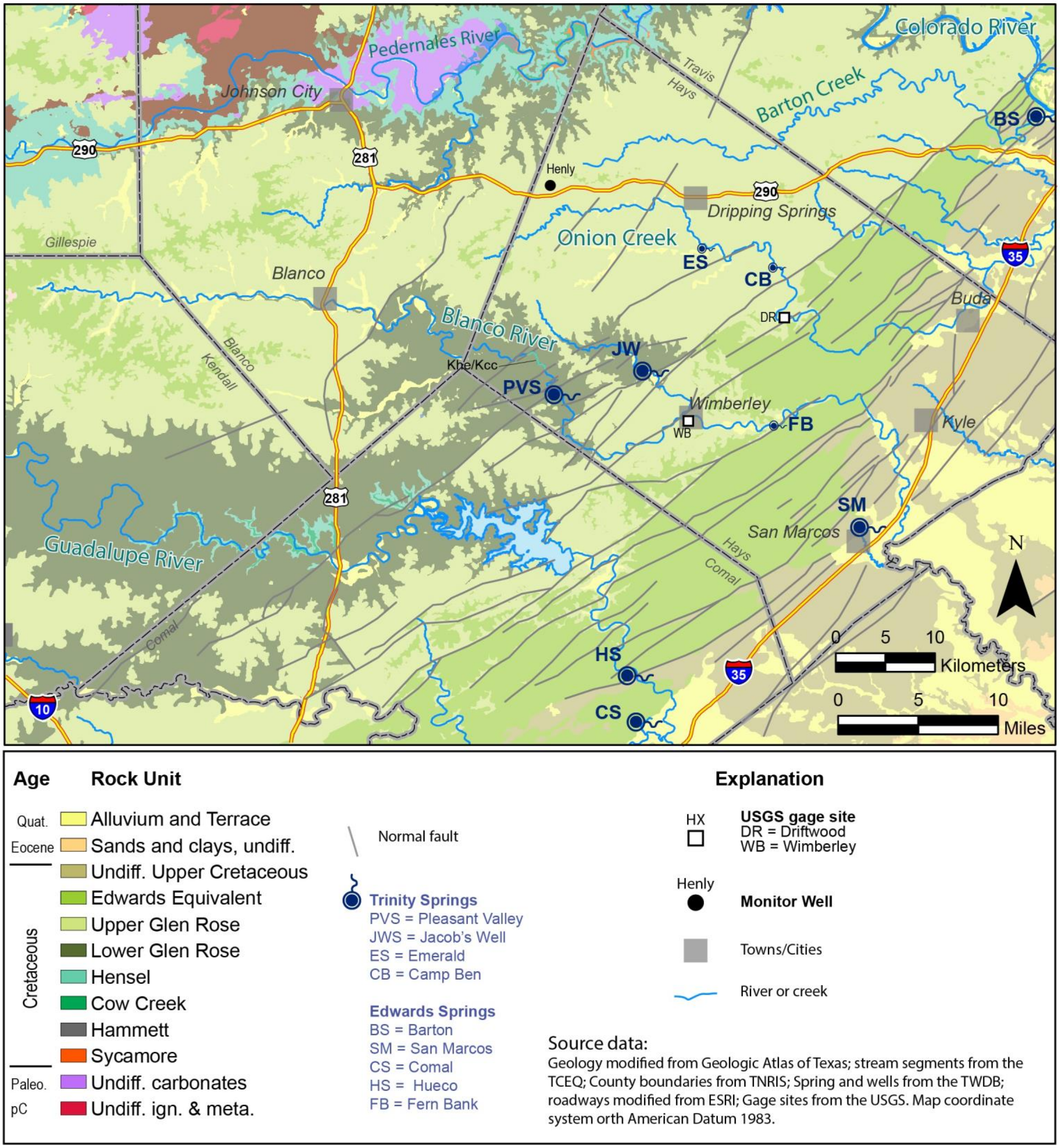

Figure 1. *Geologic map of the study area. Modified from Hunt et al., 2017a.*

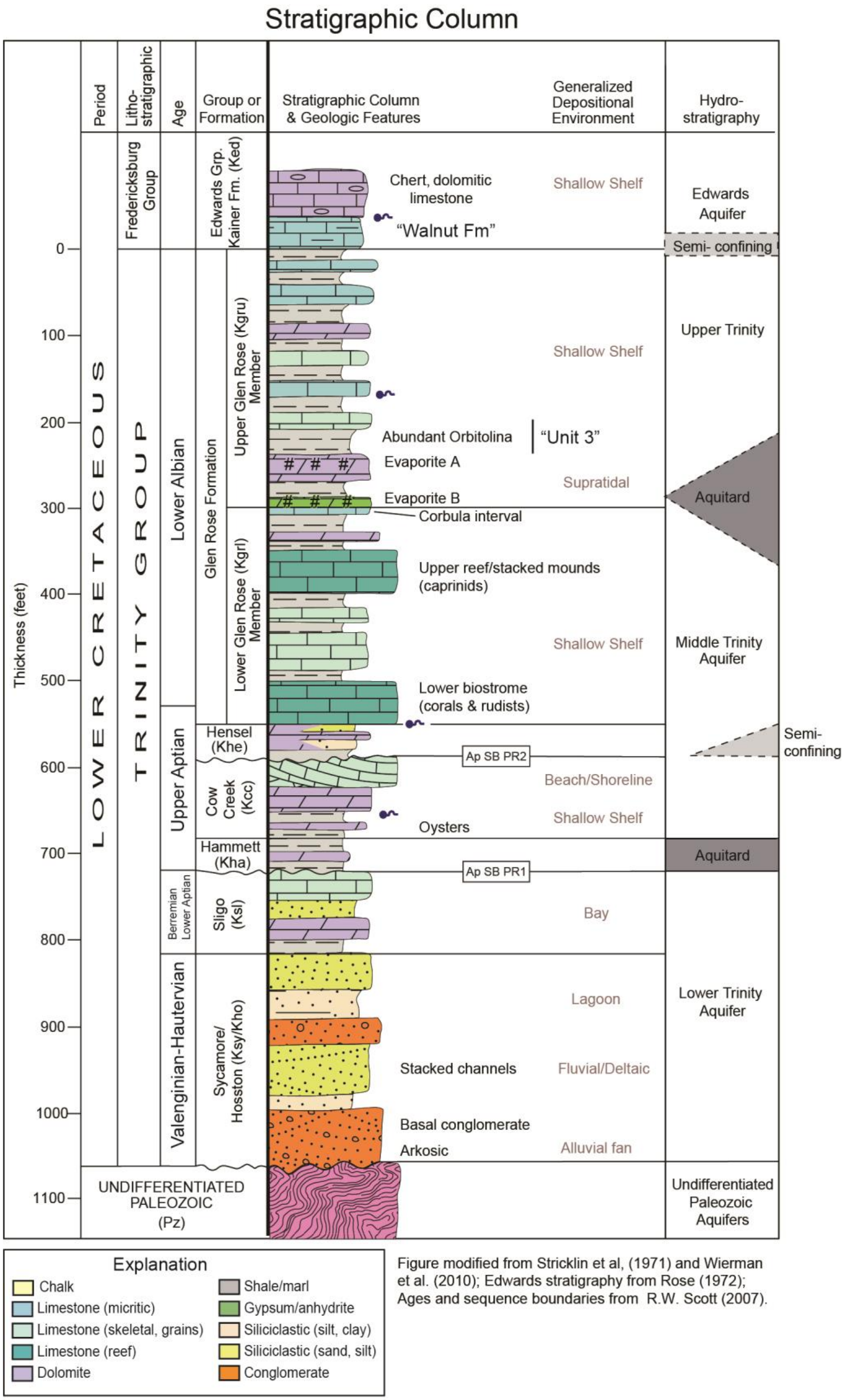

Figure 2. *Stratigraphic and hydrostratigraphic column. From Hunt et al., 2017a.*

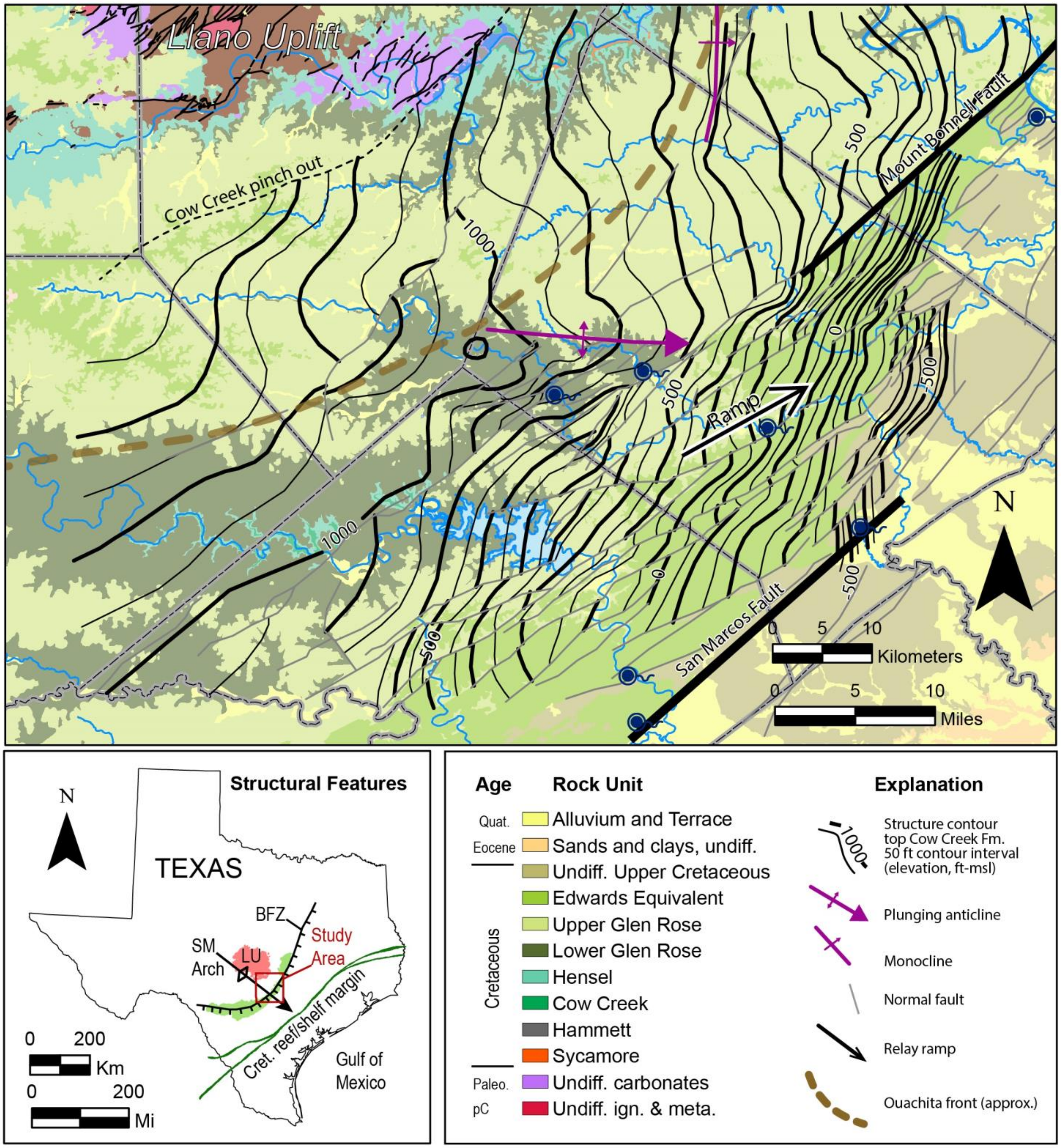

Figure 3. *Geologic and structural map. From Hunt et al., 2017a. Structure data and contours are modified from Wierman et al., 2010 with additional data from Al Broun (unpublished data).*

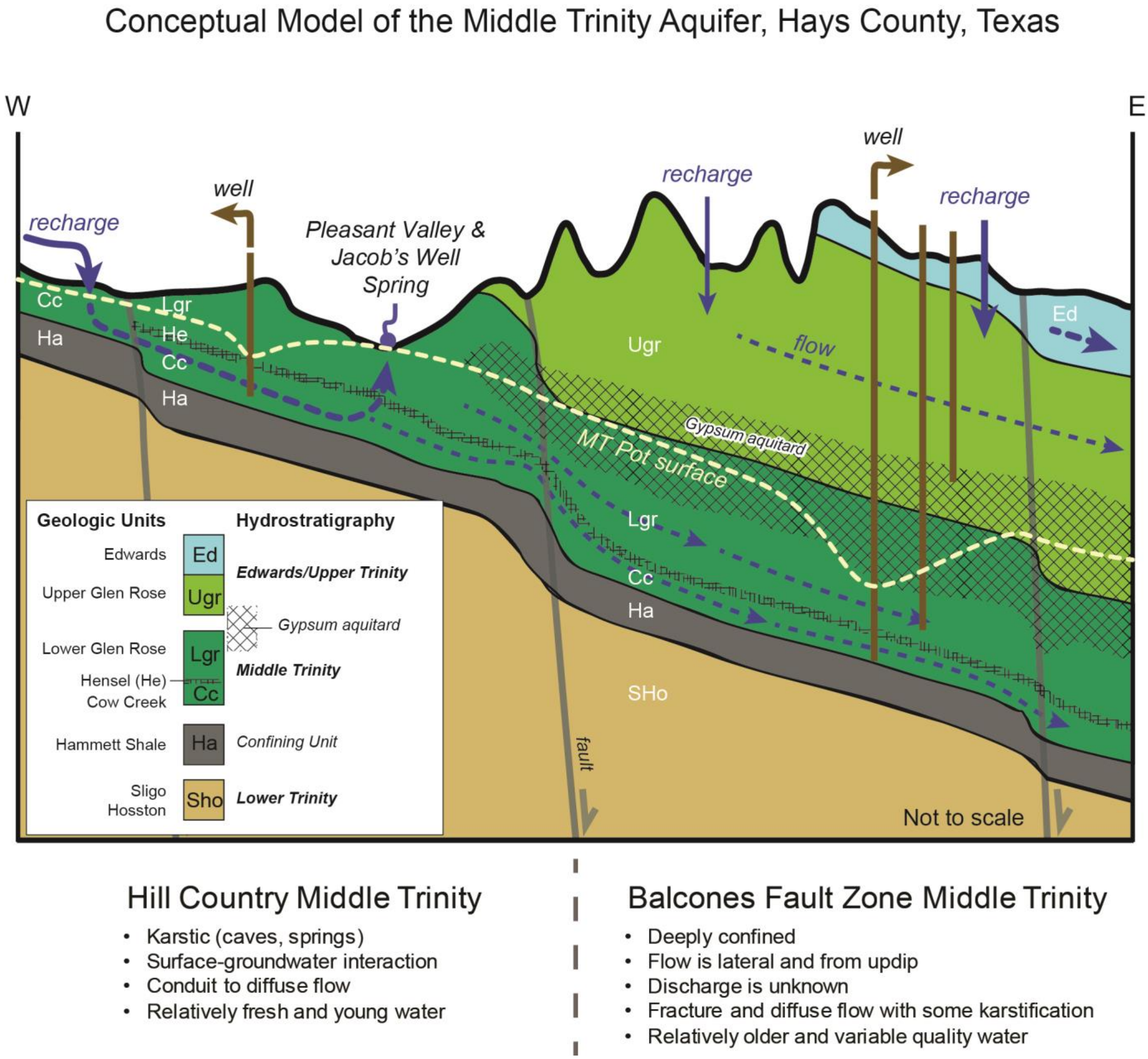

Figure 4. *Schematic conceptual model of the Middle Trinity Aquifer. Modified from Hunt et al., 2017a.*

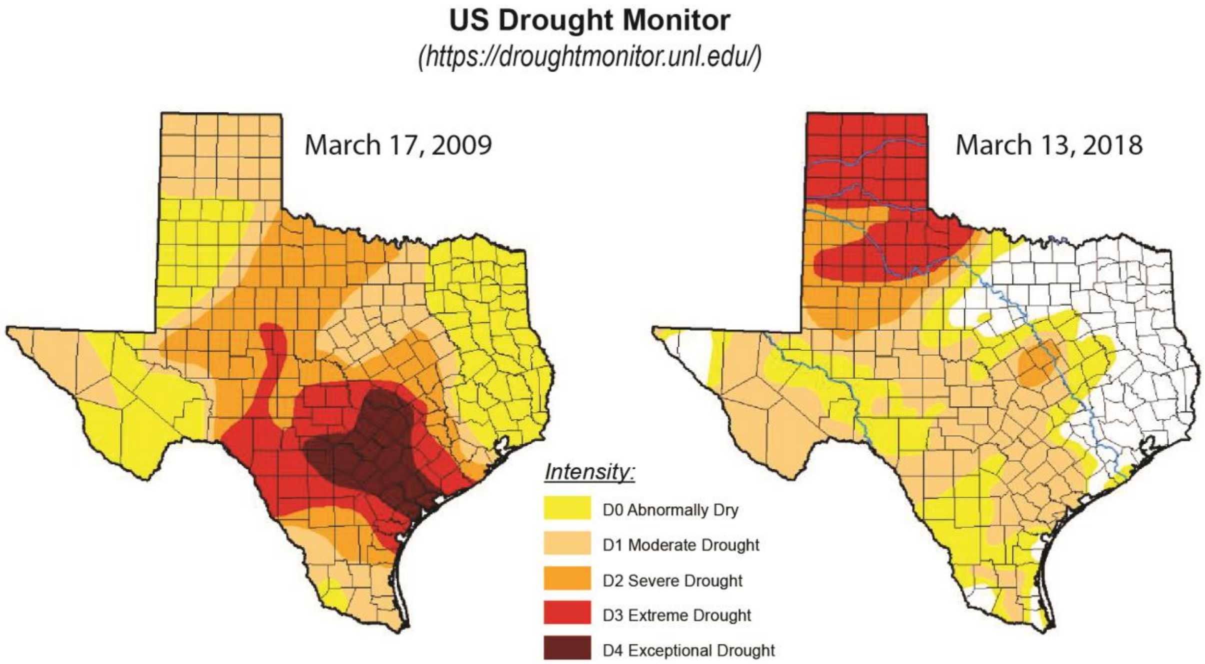

Figure 5. *Drought map produced by the US Drought Monitor showing conditions during the synoptic event in 2009 vs 2018.*

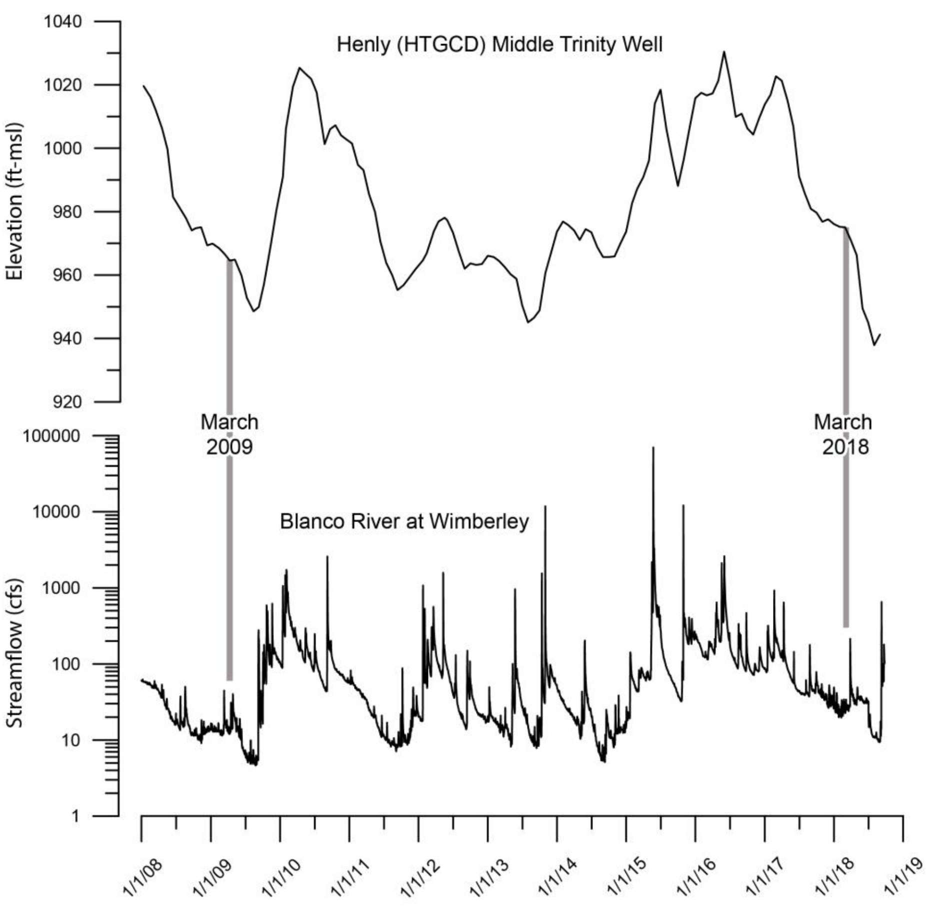

Figure 6. *Hydrograph of the USGS flow data from the Blanco River at Wimberley and the Henly Middle Trinity Monitor well (Figure 1). The general time periods for the synoptic of 2009 (Hunt et al, 2010) and this study area shown.*

METHODS AND DATA

Water-level measurements were collected using either manual measurements or less frequently from automated recorders. Manual measurements were most often made with a calibrated electric tape (e-line) or, less commonly with a sonic meter. Manual e-line measurements are generally accurate to within ±0.01 feet, and sonic measurements are less accurate and precise with an error of about 2 ft.

Data sources include field measurements by the authors and contributors, the Texas Water Development Board automated recorders, elevations of known springs, and some data from previous studies (Hunt et al., 2010; Watson et al., 2014).

Data Compilation, Validation, and Quality Assurance

Data were compiled into a spreadsheet and mapped using GIS software (ESRI ArcMap). Water level elevations were contoured and compared to the historic published potentiometric maps of Hunt et al., 2010 and Watson et al., 2014. Comparison to historic maps allowed general quality assurance and control on the 2018 data. All data were carefully reviewed and were omitted from the compilation if suspected of questionable well completion, significant influence from pumping, or other anomalous or non-representative conditions.

Contouring and Mapping

All water-level data were gridded using a kriging interpolation (linear model) algorithm within Goldenware's Surfer® software. Potentiometric contours were then generated from the grid. Computer-generated contours were then manually reinterpreted and manipulated to account for qualitative data and information such as hydrogeologic boundaries, published reports, and experience of the authors.

Structure data was derived from Wierman et al., (2010) and supplemental data from Al Broun (unpublished). Figure 3 represents hand-drawn contours from Al Broun published in Wierman et al., 2010 and modified by Hunt et al., 2017a. Additional structure contours were generated from gridded data using a kriging interpolation (linear model) algorithm within Goldenware's Surfer® software.

Datums and Coordinates

Horizontal coordinates in the database are in latitude and longitude. Many of the sites had locations that were previously recorded by the TWDB or within other published sources (Hunt et al., 2010; Waston et al., 2014). New sites and verification of existing sites was done using Google Earth. Horizontal datums in GIS are in North American Datum 1983 (NAD83). Horizontal accuracy of the locations is likely within about 20 feet, or better.

Water-level measurements are made in reference to a measurement point (MP) at the well head. Commonly, the MP corresponds to the top of casing (TOC). The MP or TOC measurement is subtracted from the depth-to-water measurement to reflect a depth from the land surface datum (LSD). LSD is generally defined as the top of the concrete slab around the casing, or from ground level if no slab exists. All depth to water measurements are referenced to LSD (in feet). Elevations for LSDs are in feet above mean sea level and were generally obtained from existing databases (TWDB), published reports (Hunt et al., 2010; Waston et al., 2014), or Google Earth for new sites. Vertical datums are either National Geodetic Vertical Datum 1929 (NAVD29) or National Geodetic Vertical Datum 1988 (NAVD88). Each elevation was verified in Google Earth. The accuracy of the LSD of a well is the largest source of error for the elevation data in this report and is likely less than 10 feet.

RESULTS

Figure 7 is a potentiometric map of the Middle Trinity Aquifer. A larger version (11x17 inch) of the map is provided in **Appendix 1**. **Appendix 2** contains the well-control data used to produce the contour map. **Appendix 3** provides the supplemental data from 2009 (Hunt et al., 2010) used to qualitatively constrain the contours in areas with sparse data. **Appendix 4** contains the locations of some Middle Trinity Springs in the study area. **Figure 8** combines the March 2009 potentiometric map of the Middle Trinity Aquifer for direct comparison. **Figure 9** shows the structure contours of the top of the Cow Creek with other structures compared to the 2018 potentiometric map.

DISCUSSION

The potentiometric map can help characterize flow characteristic and hydrologic boundaries. Some observations about flow and boundaries are discussed below.

Groundwater Flow

Previous potentiometric maps (Mace et al., 2000; Hunt et al., 2009; Watson et al., 3014) are remarkably similar to the 2018 potentiometric map provided in this report (**Figure 8**). Groundwater flow within the Middle Trinity Aquifer is generally west to east from Gillespie, Blanco, and into Hays counties (**Figure 7**). Water-level elevations in central Hays County are relatively flat in the area between Onion Creek and Cypress Creek—two surface streams that have some portions that have losing reaches. North of Onion Creek in Hays and Travis Counties, the heads have a steep gradient to the northeast. Thus, groundwater flow in the Middle Trinity in Travis County is predominately to the northeast and appears derived mostly from Hays County. Groundwater contours in Travis County suggest that the Mount Bonnell Fault may play a role as barrier to eastward flow, as noted by Mace et al., (2000).

A significant trough in the potentiometric surface is located upgradient from Jacob’s Well Spring (JWS) in Cypress Creek. The trough is related to the Jacob’s Well conduit that is mapped in that area and is a feature common within the karstic Edward Aquifer (Hunt et al., 2007).

Groundwater flow south and east of the Cypress Creek is to the east-southeast past the major springs and into the BFZ. Gradients steepen southeast of Cypress Creek into the BFZ, then flatten out on the eastern edge of the study area in an area corresponding to the confined zone of the Edwards Aquifer.

The overall flow direction and potentiometric gradients appear to follow the structure contour gradients that reflect depositional dip and faulting or anticlinal structures (**Figure 9**). For example, the flat gradient within central Hays appears to occur coincident with a broad arch that is bound on the south by a more localized anticlinal structure. The exception is the flow in northern-most Hays and western-most Travis Counties that has flow normal to the structural dip.

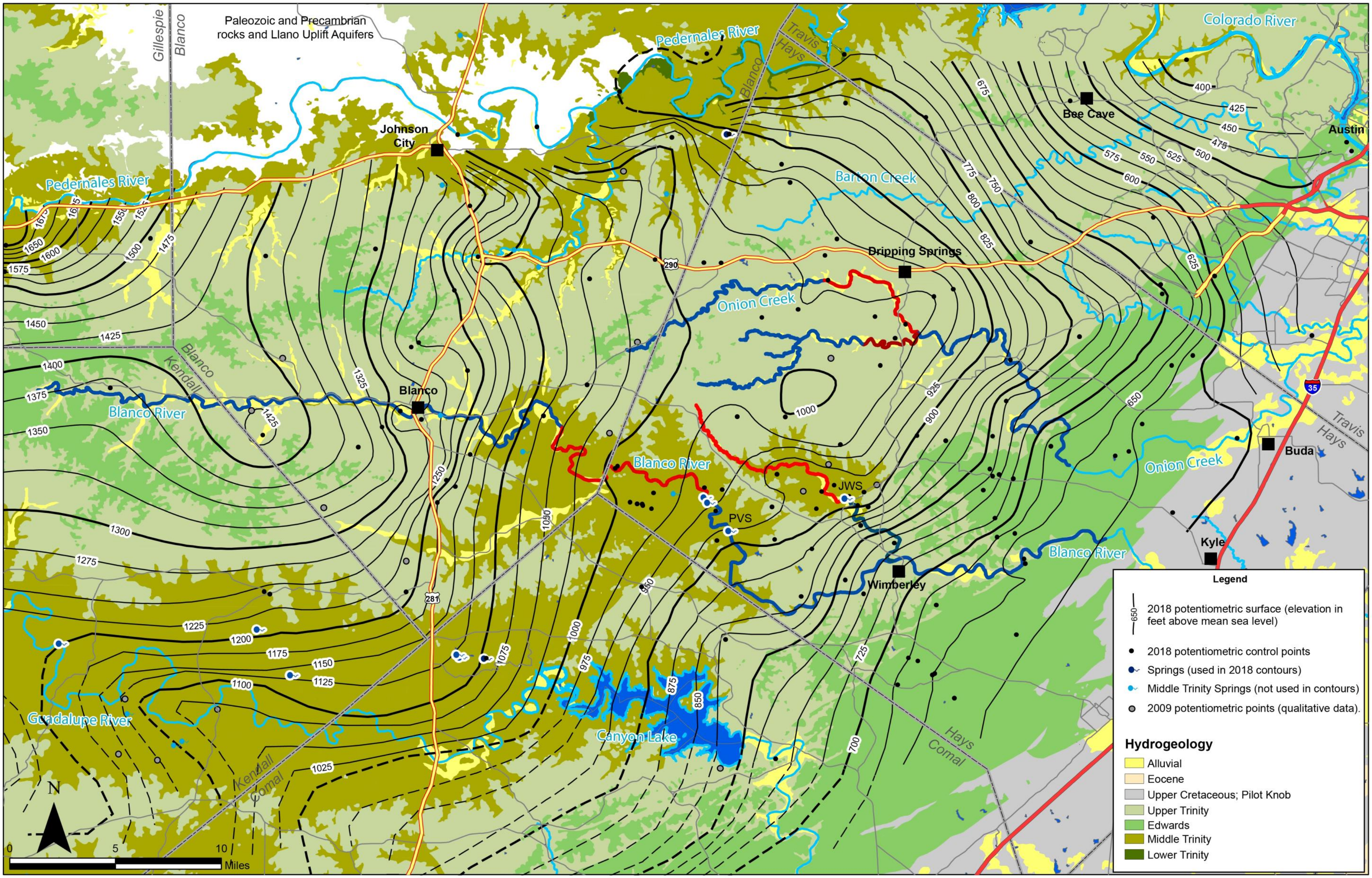

Figure 7. *Potentiometric map of the Middle Trinity Aquifer.*

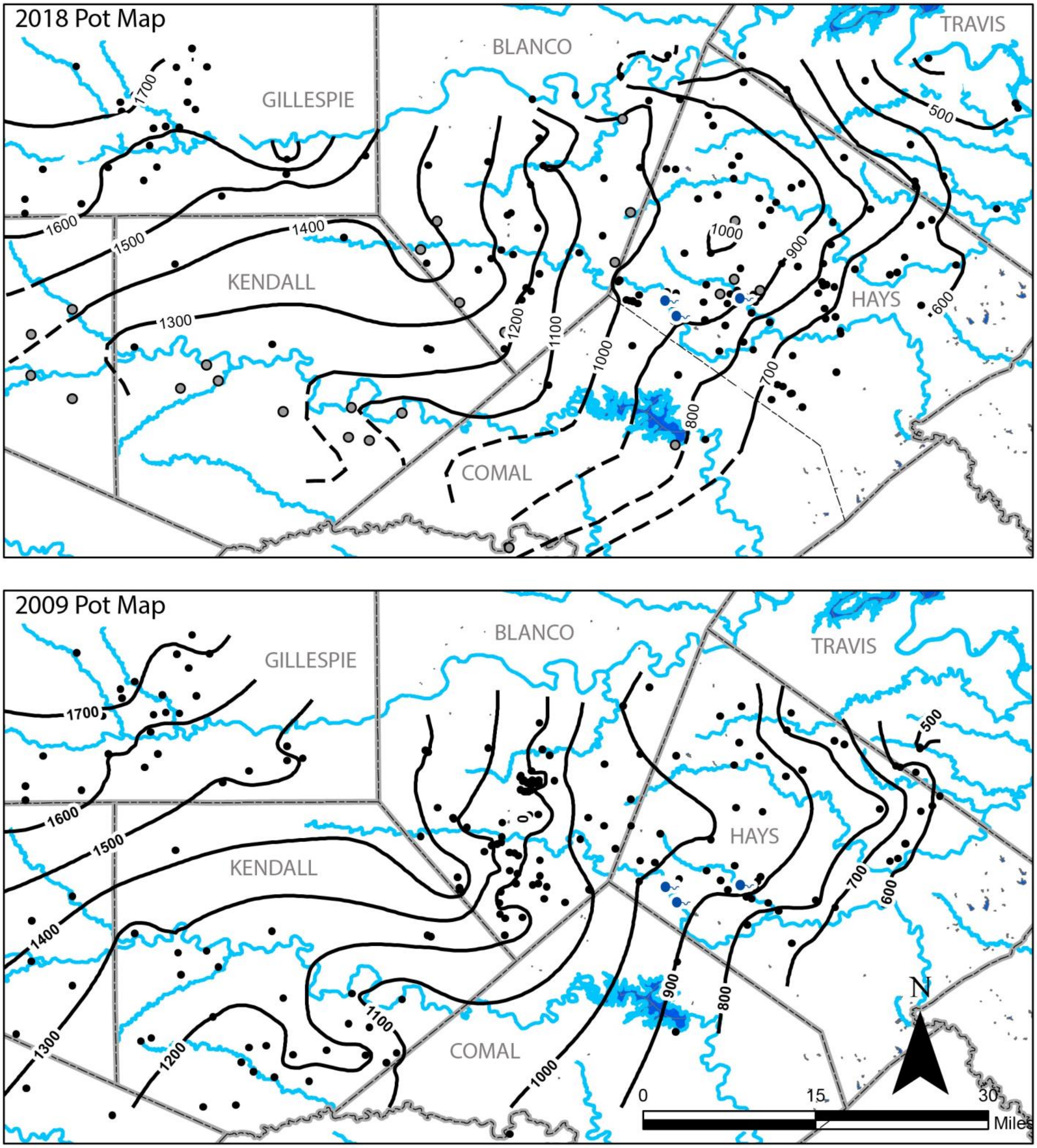

Figure 8. A comparison of potentiometric maps from 2018 (top; this study) and 2009(bottom; after Hunt et al., 2010).

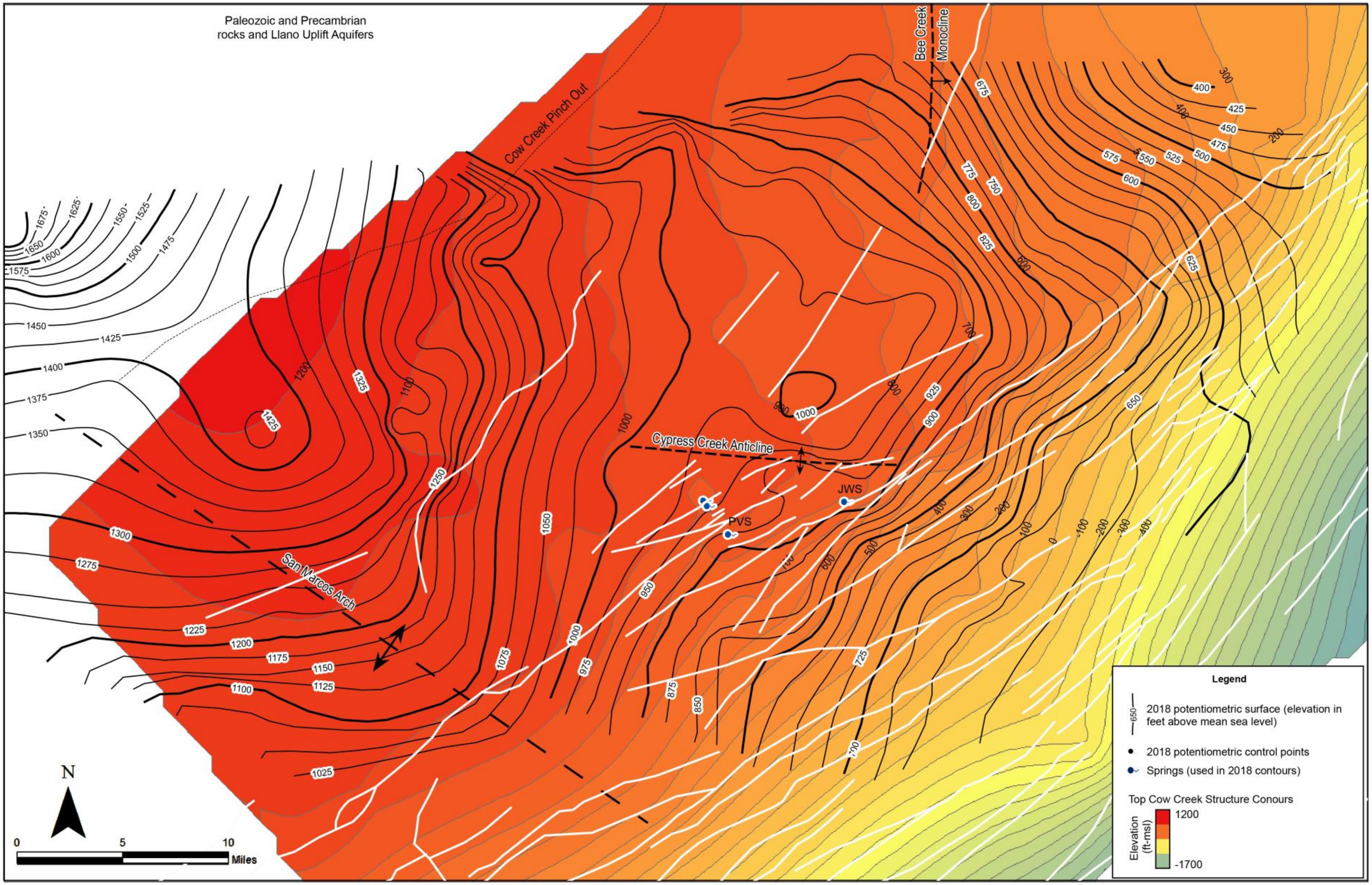

Figure 9. *Colored structure contour map of the top of the Cow Creek Formation with mapped faults (white), other anticline features (dashed) compared to the potentiometric surface (black lines). Structure contours were gridded in Surfer with no manual re-interpretation. Faults are from the Geologic Atlas of Texas modified by Wierman et al., 2010. Anticline and monocline structures from Wierman et al., 2010. San Marcos Arch axis is from Rose, 1972.*

Hydrologic Boundaries

A prominent potentiometric ridge exists along the Blanco-Kendall County line that may extend over Canyon Lake. This ridge appears consistent within previous published maps (Mace et al., 2000; Hunt et al., 2010). The hydrologic ridge appears to be related to the underlying structural ridge, which may also be related to the broad crest of the San Marcos Arch (**Figure 9**).

Faulting appears to influence the gradients and perhaps direction of flow. The Mount Bonnell/Tom Creek Fault may act as a barrier to eastward flow from about Bear Creek and FM 1826 in Hays County to north of the Colorado River. This may be related to the larger degree of throw along this portion of the fault zone.

Southwest of Onion Creek the faults do not appear to act as barriers to flow as the potentiometric contours continue to the east. This may be related to the relay-ramp structures discussed in Hunt et al., (2015).

The Pedernales river is inferred to be a gaining segment, in part, from the Middle Trinity Aquifer (**Figure 7**). This is primarily based on the work of Bluntzer (1992), Bush et al., (1983), and Wierman et al., (2017). The Colorado River is often assumed to be a hydrologic barrier or boundary condition for numerical models (Mace et al., 2000). However, the data in this study suggest it is not a discharge boundary. Despite the Colorado River being the regional base level (lowest surface elevation), and the fact that the Lower Glen Rose is exposed within the channel of the Colorado River west of the BFZ, the heads in this study appear to be below the elevation of the river. This is based on relatively sparse data and should be revisited in future studies.

Future Work

Very little information exists about the potential influence of the Paleozoic Aquifers on the Middle Trinity. Previous studies indicate a hydrologic connection (Bluntzer, 1992; Wierman et al., 2017), but further work is needed to characterize those connections.

It is not clear why the heads north of Onion Creek and into Travis County appear depleted compared to the rest of Hays County. This could be result of pumping, changes in the lithology, or facies of the units that could result in porosity and permeability changes, or some combination of both.

The natural discharge of the eastward flow of groundwater in the BFZ Middle Trinity is unknown. It is possible that the natural discharge is into overlying units east of the BFZ. The natural discharge of the northward flow of groundwater in the HC Middle Trinity units north of the Colorado River is also unknown. One possibility is that the lower heads is part of the southern margin of a regional drawdown cone of depression from historic pumping of the Trinity Aquifer centered around McLennan County (Waco) (George et al., 2011). Further work is needed to characterize Middle Trinity heads north of the Colorado River.

Locally heads at individual well locations may not accurately reflect the average head within the Middle Trinity Aquifer at that location. There is head differential documented within the geologic units that compose the Middle Trinity Aquifer, which includes the Cow Creek, Hensel, and Lower Glen Rose. Some of the head variability depends of the well completion, geologic setting, recharge conditions, and the permeability of the Hensel separating the Cow Creek from the overlying Lower Glen Rose. For example, head data from multiport monitor wells indicates a head differential between the Lower Glen Rose and the Cow Creek of up to 40 ft (Hunt and Smith et al., 2017). To complicate the issue, despite the head separation in the area surrounding this particular multiport well, aquifer testing indicates communication between the Lower Glen Rose and Cow Creek (Hunt and Smith, 2017). In other multiport wells, head data throughout the Middle Trinity are relatively similar (Hunt et al., 2016). More work is needed to fully characterize the heads within the Middle Trinity Aquifer.

CONCLUSIONS

The March 2018 potentiometric map provides critical information to the overall flow patterns and potential boundaries for the Middle Trinity Aquifer. The data and interpretations are consistent with previous published maps. This data set should be used to help refine the conceptual model of the aquifer, numerical modeling, and highlights areas for future study.

ACKNOWLDEGMENTS

Data was collected for this study by the authors, collaborators, and a number of additional contributors including: Vanessa Escobar, Kendall Bell-Enders and Erin Swanson (BSEACD); Jessica Quintanilla (EAA); and students from a karst hydrogeology class at the University of Texas at Austin under the supervision of Dr. Marcus Gary. We would like to acknowledge and thank all the land owners and agencies that provided access to their wells for data collection.

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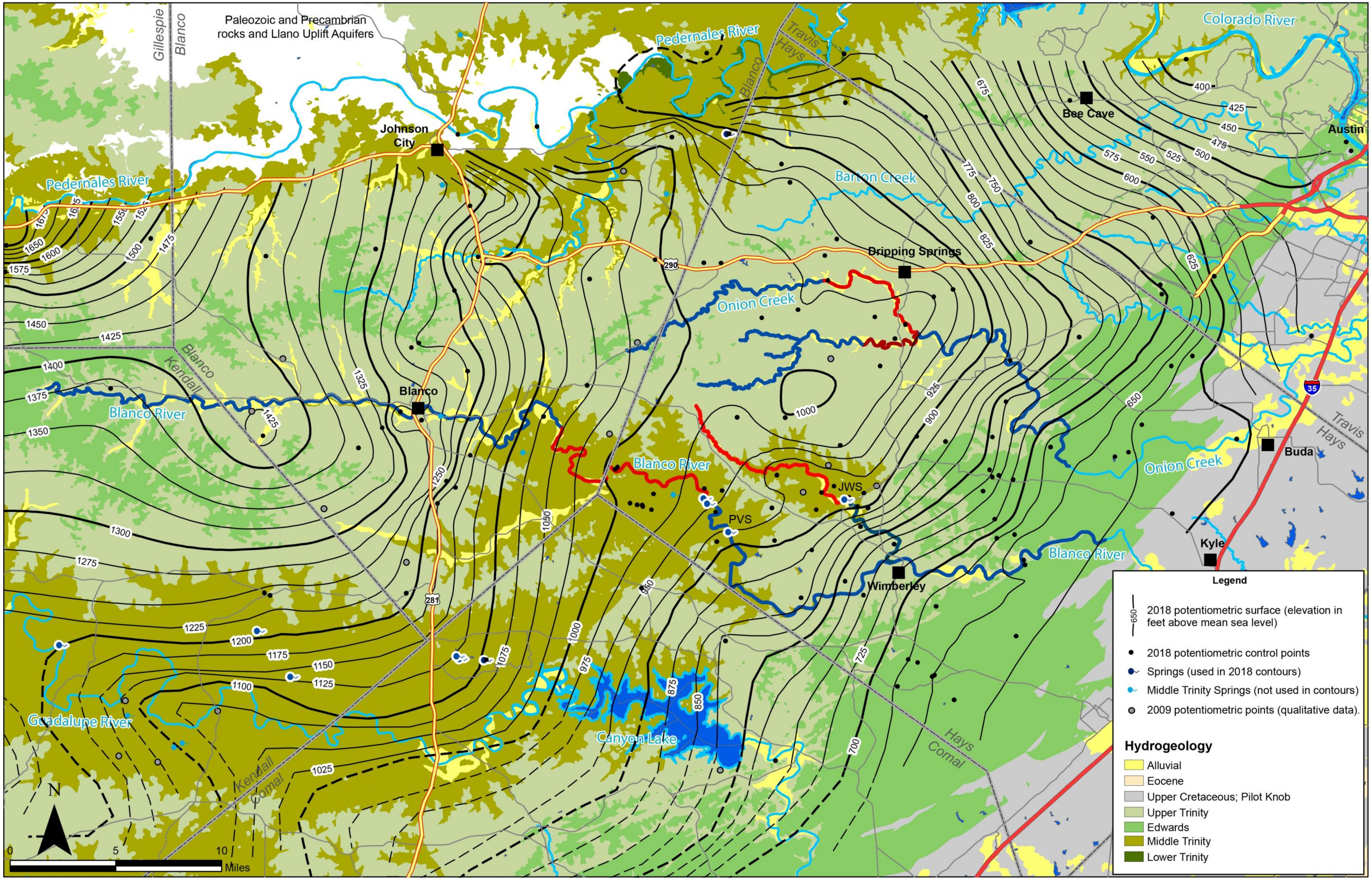
APPENDICES

Appendix 1: Middle Trinity Potentiometric Map



Appendix 2: Middle Trinity 2018 Potentiometric Data

Name	SWN	Other_ID	Source	Ddlat	Ddlong	Surface_Elevation	Surface_Elev_new	Aquifer	Owner	Well_depth	Equipment	Staff	2018_Date	2018_DTW	MP	2018_WL_Elev	Comment_	Notes
Seiders	5842937		BSEACD	30.273200	-97.780640	574		Middle Trinity (Cow Creek)	Roy Seiders	1060	e-line	KBE	16-Apr-18	52.78	1.35	522.57		
Cornerstone	5842936		BSEACD	30.279380	-97.784100	573		Middle Trinity (Cow Creek)	Hunter and Teresa Jones	1020	e-line	KBE	16-Apr-18	125.85	2	449.15	Well was on, couldn't get static level	
Onion Creek CC	5850864		BSEACD	30.146492	-97.807914	654		Middle Trinity				ES	07-May-18	141.9	1.5	513.6	140.3 sonic	
Antioch Westbay	5858431		BSEACD	30.075833	-97.859167	702		Middle Trinity (Cow Creek)	BSEACD monitor well	1375	Westbay tool	JC/BH	01-May-18	93.61	2	610.39	Zone 1 99.19 ft (lower Kcc)	
Wildflower Center	5850424		BSEACD	30.187333	-97.874528	818		Middle Trinity (Cow Creek)	UT Austin		e-line	KBE	16-Apr-18	234.95	2.85	585.9	BSEACD transducer in well	zone 2-Cow Creek
Aqua Tx-Cardinal Plant	5849910		BSEACD	30.132778	-97.889442	827		Middle Trinity		850	eline	VE	24-Apr-18	221.65	2.45	607.8		
Commons Ford PWS	5841311		BSEACD	30.336028	-97.893833	588		Middle Trinity	CoA Parks and Rec		eline	BH	30-Apr-18	225.7	2	364.3	sonic 226.0	
Anthem/Clark Wilson	5857918	453228	BSEACD	30.024528	-97.903225	842		Middle Trinity (Cow Creek)		1460	eline	JC	04-May-18	230.66	3.3	614.64		
Borheim Trinity			BSEACD	30.125940	-97.903820	789.86		Middle Trinity		1000		JC	19-Apr-18	157.4	3.63	636.09		
Spillar Test Well			BSEACD	30.175000	-97.910277	884		Middle Trinity		840		JC	19-Apr-18	178.46	1.66	705.54		
Grey Rock #5	5849616		BSEACD	30.181389	-97.911389	940		Middle Trinity	City of Austin	809	eline	BH	02-May-18	245.6	3	697.4	static level	
Hunt	58501HU		BSEACD	30.227706	-97.916417	1012		Middle Trinity (Lower Glenrose)	Brian Hunt	480	eline		13-Apr-18	353.1	0.85	659.75		
KBDJ - Trinity Production Well	5857211		BSEACD	30.085583	-97.924028	820		Middle Trinity		1100	eline	VE	18-Apr-18	212.1	2.05	609.95		
Ruby Westbay Well	5857513		BSEACD	30.066729	-97.933189	815		Middle trinity				JC	19-Apr-18	187.88	1.5	628.62	Zone 2; Zone 3 = 187.7	
Sky Cow Creek	5857507		BSEACD_mon	30.063583	-97.942531	884		Middle Trinity (Cow Creek)			eline	JC	18-Apr-18	239.35	0.8	645.45	241 sonic; Dual completion well with piezometer into Cow Creek	No well house yet, house just finished in Oct 2014, Straight Wall
Wizard Academy	5849715		HTGCD_mon_wells	30.145694	-97.967056	1059	1065.137	Middle Trinity?			sonic	JW	19-Apr-18	266.7	0.7	793		
Travis Co. Pct 3 Multiport	5841408		BSEACD	30.307914	-97.973383	989		Middle Trinity (Cow Creek)	BSEACD	717	Westbay tool	JC/BH	30-Apr-18	456.76	2	534.24	Zone 6 Cow Creek	Formerly owned by Don Cole
Nelson		375459	EP Synoptic 2015	30.070266	-97.986634	939		Middle Trinity (Cow Creek)	Todd Nelson	850	eline	JC	18-Apr-18	279.4	1.75	661.35	281.7 sonic	
Grolnic	5756305		HTGCD_mon_wells	30.210845	-98.000509	1178	1176.151	Middle Trinity(Lower Glenrose)		450	eline	JW	19-Apr-18	439.77	1.5	739.73		
Pieter Luan	6808304		BSEACD_RC	29.989500	-98.004130	888		Middle Trinity (Cow Creek)		970	E-Line	ES	18-Apr-18	235.07	2.7	655.63	237.0' sonic	
Boltauzer		111337	BSEACD-RG	29.992778	-98.005001	905		Middle Trinity	Don Boltauzer	660	eline	JC, RG	23-May-18	285.13	1.95	621.82	sonic within 2 ft	

Name	SWN	Other_ID	Source	Ddlat	Ddlong	Surface_Elevation	Surface_Elev_new	Aquifer	Owner	Well_depth	Equipment	Staff	2018_Date	2018_DTW	MP	2018_WL_Elev	Comment_	Notes
Freeman Ranch PWS	6808603		BSEACD	29.940556	-98.010278	884		Middle Trinity			eline	JC	25-Apr-18	238.8	1.6	646.8		
Jimmy Schroeder	5764916		BSEACD_RC	30.010350	-98.011230	1039		Middle Trinity(Cow Creek)		780	E-Line	ES	18-Apr-18	382.89	1.4	657.51	385.6' sonic	
Bowman	5764604	353577	EP Synoptic 2015	30.048064	-98.012283	1028		Middle Trinity (Cow Creek)	Brenda and Thomas Bowman	850	sonic	JC	19-Apr-18	309	1.3	720.3	309 sonic	
Camp Ben McCulloch	5756907		HTGCD_mon_wells	30.129624	-98.014272	953	961.737	Middle Trinity		360	eline	JW	19-Apr-18	83.53	2.42	871.89		
Mandola			HTGCD_mon_wells	30.101248	-98.017040	981		Middle Trinity (Cow Creek)		620	eline	JW	20-Apr-18	210.14	2.33	773.19		
Driftwood Multiport	5764613		BSEACD	30.050842	-98.022083	1037		Middle Trinity (Cow Creek)	BSEACD	857	Westbay tool	JC/BH	26-Apr-18	284.26	2	754.74	Kcc Zone 2 and 3	
Ed Louk	5764911		BSEACD_RC	30.007930	-98.023460	1039		Middle Trinity (Cow Creek)		960	E-Line	ES	18-Apr-18	369.35	1.45	671.1	376.2' sonic	
Miller	5764908		BSEACD	30.020833	-98.025000	1066		Middle Trinity			eline	JC	18-Apr-18	324.92	1.4	742.48	328 sonic	
Ochoa	5764605		EP Synoptic 2015	30.049785	-98.026376	1074		Middle Trinity (Cow Creek)	Bob Ochoa	810	eline	JC	18-Apr-18	299.85	1.7	775.85	221.1 sonic	
Stirling			EP Synoptic 2015	30.077140	-98.026450	1122		Middle Trinity (Cow Creek)	Jeri Ann Stirling	700		JC	19-Apr-18	331	1.7	792.7		
Lowe	5764607		BSEACD	30.054722	-98.028333	1085		Middle Trinity (Cow Creek)		860	eline	JC	18-Apr-18	295.6	1.3	790.7	298.6 sonic	
Wood01		233129	EP Synoptic 2015	30.039986	-98.033022	1065		Middle Trinity (Cow Creek)	Don and Jill Wood	790	eline	JC	18-Apr-18	313.8	1.84	753.04	253.6 sonic	
Pam and RandolphHiriart	6808805		BSEACD_RC	29.896980	-98.052700	967		Middle Trinity (Lower Glenrose)		840	E-Line	ES	18-Apr-18	320.5	1.8	648.3	328.0' sonic	
Broun	5756519		HTGCD_mon_wells	30.178298	-98.053499	1118		Middle Trinity (Lower Glenrose)		280	eline	JW	20-Apr-18	164.15	1	954.85		
Bachardy			HTGCD_mon_wells	30.074167	-98.058611	1207		Middle Trinity(Cow Creek)		-690	eline	JW	18-Apr-18	351.69	1.58	856.89	transducer	
Amos			HTGCD_mon_wells	29.961070	-98.065135	1130		Middle Trinity (Cow Creek)		868	eline	JW	18-Apr-18	470.75	2	661.25	transducer	
Graham			BSEACD-RG	29.913903	-98.066119	1006		Middle Trinity	Renee Graham	930	eline	JC, RG	16-May-18	362.5	2.2	645.7	sonic within 2 ft	
Stars Hollow	5756521		HTGCD_mon_wells	30.173333	-98.066667	1184		Middle Trinity		505	eline	JW	20-Apr-18	204.32	1.5	981.18		
Pittman		123370	BSEACD-RG	29.913061	-98.067786	1001		Middle Trinity	Jason Pittman	980	eline	JC, RG	15-May-18	356.98	1.5	645.52	sonic within 2 ft	
TWDB_Murphy	5748505		TWDB	30.296472	-98.072075	1150		Middle Trinity (Lower Glenrose)			transducer	TWDB	17-Apr-18	349.91		800.09	https://waterdatafortexas.org/groundwater/well/5748505	
Gandy			BSEACD-RG	29.922501	-98.077689	1002		Middle Trinity	Dale Gandy	950	eline	JC, RG	15-May-18	335.13	0.8	667.67	sonic within 2 ft	

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Downing	5764502		EP Synoptic 2015	30.077499	-98.078332	1218		Middle Trinity (Cow Creek)	Ken Downing	600	transducer	TWDB	17-Apr-18	324.3	1.9	895.6	https://waterdatafortexas.org/groundwater/well/5764502	submersible
Tanner Craigen	6808402		BSEACD_RC	29.924730	-98.084110	1032		Middle Trinity (Cow Creek)		910	E-Line	ES	18-Apr-18	357.85	1.5	675.65	359.7' sonic	
DSWS Well #1	5756702		HTGCD_mon_wells	30.154250	-98.086000	1051		Middle Trinity(Cow Creek)		345	transducer	TWDB	17-Apr-18	68.3	0	982.7	https://waterdatafortexas.org/groundwater/well/5756702	
Hastings			BSEACD-RG	29.906112	-98.091667	1040		Middle Trinity	Jeff Hastings	935	eline	JC, RG	15-May-18	371.66	0.9	669.24	sonic does not work	
DSISD 2 (Kgrl)	5756718		HTGCD_mon_wells	30.144585	-98.093280	1089	1090.8	Middle Trinity(Lower Glenrose)					16-Apr-18	105.35	0	983.65		Marcus access only
DSISD 1 (Kcc)	5756716		HTGCD_mon_wells	30.144528	-98.093332	1089	1088.39	Middle Trinity(Cow Creek)					16-Apr-18	107.27	2.6	984.33		
Sabino Ranch			HTGCD_mon_wells	30.003610	-98.093890	871		Middle Trinity		760	eline	JW	18-Apr-18	116.75	1.7	755.95	transducer	
O'Neil Ranch Road	5756710		HTGCD_mon_wells	30.125872	-98.103433	1195	1200.603	Middle Trinity		420		JW, MOG	16-Apr-18	199.7	1.1	996.4		soon to be TWDB telemetry
Hog Hollow (Dupuy)	5756714		HTGCD_mon_wells	30.159444	-98.106944	1167		Middle Trinity		480	eline	JW	18-Apr-18	192.94	1.7	975.76		
WC Maintenance 2			HTGCD_mon_wells	30.028610	-98.111667	964		Middle Trinity		446	eline	JW	18-Apr-18	48.17	2	917.83	transducer	middle trinity spring
HTGCD HCP3			Watson_2013	30.038700	-98.114680	1037.262277		Middle Trinity			eline	JW	18-Apr-18	121.42	2.3	918.142277		
Glenn			HTGCD_mon_wells	29.968890	-98.114720	1080		Middle Trinity		680	eline	JW	18-Apr-18	325.25	1.2	755.95	transducer	
Wimberley WSC	5764705		TWDB	30.015833	-98.116944	938		Middle Trinity		400	transducer	TWDB	17-Apr-18	120.35	0	817.65	https://waterdatafortexas.org/groundwater/well/5764705	
Camp Young Judaea	5764714		HTGCD_mon_wells	30.029533	-98.118811	958	956.09	Middle Trinity		250			16-Apr-18	40.55	2.3	919.75		
HTGCD Graham			Watson_2013	30.033320	-98.123800	954.261569		Middle Trinity			eline	JW	18-Apr-18	36.27	0.4	918.391569		
Baker			2018 Dye trace	30.035780	-98.124640	985.093		Middle Trinity (Cow Creek)				UT	07-Apr-18	63.58	2.05	923.563		
Jacob's Well Spring	8170990		Spring	30.034444	-98.126111	922.84		Middle Trinity (Cow Creek)				UT	07-Apr-18	0	0	922.84		
Tom Hegemier			HTGCD_mon_wells	30.306454	-98.127110	1066	1074.988	Middle Trinity (Cow Creek)		320	sonic	JW	19-Apr-18	236	1.2	831.2		
Schoen			Watson_2013	29.978270	-98.127338	920.626653		Middle Trinity				JQ	17-Apr-18	138.64	1.7	783.686653		
TWDB_Hamilton Pool	5747312		TWDB	30.339650	-98.128150	833		Middle Trinity (Cow Creek)	Travis County	244	transducer	TWDB	17-Apr-18	56.91		776.09	https://waterdatafortexas.org/groundwater/well/5747312	
Brazil			Watson_2013	30.071370	-98.130800	1272.834718		Middle Trinity	Patrick Brazil		eline	BH	23-Apr-18	293.3	1.6	981.134718	sonic same depth	
Jack Brown	5755301		HTGCD	30.212821	-98.133139	1309.38	1314.09	Middle Trinity		510		JW	19-Apr-18	360.4	2.04	951.02		

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Flocke			2018 Dye trace	30.043472	-98.134955	1021		Middle Trinity (Cow Creek)				UT	07-Apr-18	100.16	0.71	920.13		
Whit Hanks	5755607		HTGCD	30.184465	-98.139256	1127.923		Middle Trinity		381	telemetry	TWDB	17-Apr-18	155.88	1.6	973.643	https://waterdatafortexas.org/groundwater/well/5755607	
Wierman			HTGCD	30.201511	-98.141352	1260		Middle Trinity (Lower Glenrose)	Doug Wierman	420	eline		16-Apr-18	292.8		967.2		plumbed with submerscible, but not in service
Wood Creek 23	5763908		EP Synoptic 2015	30.039166	-98.143610	1050		Middle Trinity (Cow Creek)	Woodcreek Development	284	eline	JW	18-Apr-18	131.75	1.5	919.75		New well, should be able to find SWR; conductivity seems high, owner says WQ is exceptional; might be KCC
Section 25			HTGCD_mon_wells	30.027222	-98.147222	1040		Middle Trinity(Cow Creek)		300	eline	JW	18-Apr-18	120.75	1.3	920.55	transducer	Eline sticks at 300 ft, use sonic only, 710 packer
Steffien			Watson_2013	29.999670	-98.150130	1116.332208		Middle Trinity (Cow Creek)				JQ	19-Apr-18	240.47	2.3	878.162208		
Wade			Watson_2013	29.967000	-98.157690	973.770863		Middle Trinity (Cow Creek)				JQ	17-Apr-18	111.9	2.3	864.170863		
Prochnow	5755907		HTGCD_mon_wells	30.164417	-98.159694	1347	1346.315	Middle Trinity			sonic	JW	19-Apr-18	376.4	1.91	972.51		
Jones		177132	BSEACD	30.251667	-98.165278	1204		Middle Trinity (Cow Creek)	Nathan and Sarah Jones		sonic	BH	26-Apr-18	239.5	2	966.5	obstruction at 40 ft; eline won't work	
Storm Ranch (Highgate) Toenail	57632		HTGCD	30.090497	-98.168541	1296.527	1293.327	Middle Trinity			sonic		16-Apr-18	294.4	1.05	1003.177		
Roman			HTGCD_mon_wells	30.264380	-98.170990	1211		Middle Trinity (Cow Creek)		360	eline	JW	19-Apr-18	299.98	2	913.02	eline-influenced by well pumping	
Hargrave			Watson_2013	30.051034	-98.174142	1159.211407		Middle Trinity (Cow Creek)	Mike and Lynn Hargrage				16-Apr-18	239.05	1.3	921.461407		
TWDB Canyon Lake Water Service Co.	6815211		TWDB	29.855417	-98.175222	870		Middle Trinity		249	transducer	TWDB	17-Apr-18	107.95		762.05	https://waterdatafortexas.org/groundwater/well/6815211	
Lovelass			Watson_2013	30.006175	-98.175713	1123.842191		Middle Trinity				JQ	17-Apr-18	221.88	2.25	904.212191		
Sklar			Watson_2013	30.028601	-98.177550	1167.663816		Middle Trinity			eline	BH	26-Apr-18	233.86	2	935.803816	sonic 235.0	
Dreyer	5755803		HTGCD_mon_wells	30.158889	-98.184444	1325	1323.088	Middle Trinity				JW	19-Apr-18	327.59	1.87	999.28		
Roberts	5763205		HTGCD_mon_wells	30.090630	-98.201450	1347	1347.362	Middle Trinity			sonic	JW, MOG	16-Apr-18	383.3	1	964.7		

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Pleasant Valley Spring	5763809		Spring	30.012223	-98.205834	925		Middle Trinity (Cow Creek)				UT	07-Apr-18	0	0	925		
Child Inc. Spring	5747802		BSEACD	30.285000	-98.206945	921		Middle Trinity (Cow Creek)			n/a	BH	27-Apr-18	0	0	921	Spring within Kcc	
TWDB Fischer	6807407		TWDB	29.937499	-98.209444	1133		Middle Trinity (Lower Glenrose)		575	transducer	TWDB	17-Apr-18	322.03		810.97	https://waterdatafortexas.org/groundwater/well/6807407	
Braumbach			Watson_2013	30.040385	-98.211631	1185.226176		Middle Trinity	Colleen and Doug		eline	BH/RG	23-Apr-18	231.65	0.42	953.996176	sonic 232.8	
Henly Church	5755401		HTGCD	30.196291	-98.212441	1336.7	1336.073	Middle Trinity		460	transducer	JW	17-Apr-18	356.22	0.95	981.43	https://waterdatafortexas.org/groundwater/well/5755405	
Housston	57638HO		BSEACD	30.005464	-98.215346	1053		Middle Trinity	Housston		eline		16-Apr-18	140.38	0.3	912.92		
DiLeo (house)			Watson_2013	30.025833	-98.216005	1008.513576		Middle Trinity (Cow Creek)					16-Apr-18	65.76	0.87	943.623576		zone 3-Cow Creek
Park Spring	5763707		Spring	30.031667	-98.220278	958	967.203	Middle Trinity (Cow Creek)				UT	14-Apr-18	0	0	958		
Middle Trinity			Meadows	30.340202	-98.222211											912	Wierman et al., 2017	
Little Park Spring	5763709		Spring	30.035278	-98.222778	959	962.488	Middle Trinity (Cow Creek)				UT	11-Apr-18	3.1	0	955.9		
Pope	5763402		Watson_2013	30.041809	-98.223838	1013.003005		Middle Trinity (Cow Creek)				UT	07-Apr-18	54.9	0.79	958.893005		
Skipton	5755405		HTGCD_mon_wells	30.196444	-98.224306	1362	1355.871	Middle Trinity (Cow Creek)		506		TWDB	19-Apr-18	381.22	1.21	981.99		
Pedernales Falls State Park	5747705		BPGCD	30.282778	-98.246111	1177		Middle Trinity				RF	19-Apr-18	188.12	1.8	990.68		
Randy Barton	57546B3		BPGCD--2009	30.198667	-98.257500	1342		Middle Trinity		440		RF	10-Mar-09	341.3	1.4	1002.1	Frank & Karen Dick-Armadillo Bar	
Still Well # 1 (Whitehouse)	57629		HTGCD	30.038169	-98.258734	1079.217		Middle Trinity?			eline	JW	11-Apr-18	80.89	0.2	998.527		
Stude #3--Hill Top Solar			Watson_2013	30.027263	-98.260026	1121.028691		Middle Trinity (Cow Creek)	Mike Stude		eline	BH/MOG	25-Apr-18	130.68	1.9	992.248691	sonic 131.7	
Stude #4--River Well	5762902	285281	Watson_2013	30.029480	-98.266050	1071.248593		Middle Trinity(Cow Creek)	Mike Stude	210	eline	BH/MOG	25-Apr-18	78.7	1.7	994.248593		
Stude #2--Guest House			Watson_2013	30.030439	-98.266486	1077.432507		Middle Trinity (Cow Creek)	Mike Stude		eline	BH/MOG	25-Apr-18	86.1	1.5	992.832507	sonic 88.1	
Zlatlkovich			Watson_2013	29.973660	-98.266880	1191.268119		Middle Trinity				JQ	19-Apr-18	239.07	1.8	953.998119		
Stude Windmill #1			BSEACD	30.030711	-98.269969	1083		Middle Trinity	Mike Stude		eline	BH/MOG	25-Apr-18	90.23	0	992.77	drilled 1962	
Stude Windmill #2			Watson_2013	30.031831	-98.274776	1091.065896		Middle Trinity	Mike Stude		eline	BH/MOG	25-Apr-18	94.33	0	996.735896		new well added by EAA staff
Pedernales			Meadows	30.314107	-98.282046											900	Wierman et al., 2017	

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Narrows #2		343751	BSEACD	30.056667	-98.283334	1104		Middle Trinity (Cow Creek)	Estate of Catherine Ann Craft	220	eline	BH/RG	23-Apr-18	117.55	1.4	987.85	Sonic 118.8 ft	domestic
Narrows			Watson_2013	30.054983	-98.284984	1094.860466		Middle Trinity (Cow Creek)	Dorothy and Eddie Gumbert		eline	BH/RG	23-Apr-18	106.5	0	988.360466		stock use
Franklin Ranch	57545EP		BPGCD--2009	30.185472	-98.302500	1359		Middle Trinity				RF	04-Mar-09	317.53	1.6	1043.07	East Pasture well	hardly used
Arnosky Farms--Blue Barn		34776	BPGCD	30.112643	-98.304267	1333		Middle Trinity	Arknosky Farms	360	eline	BH	26-Apr-18	277.69	1.4	1056.71	sonic 278.3; water-bearing 292-318	unused; main road
Karen Wagenfehr Well		57621KW	BPGCD	30.091300	-98.334110	1210		Middle Trinity				RF	24-Apr-18	140.1	1.5	1071.4		unused; main road
Pedernales			Meadows	30.290013	-98.338415											1000	Wierman et al., 2017	
Rebecca Springs			Spring	29.924444	-98.373055	1094		Middle Trinity (Cow Creek)				BSEACD	17-Apr-18	0	0	1094		
Miller Creek Replacement Well		57536PR	BPGCD	30.200450	-98.378940	1264		Middle Trinity				RF	24-Apr-18	172	2	1094		
David Seymour Well		57616DS	BPGCD	30.064500	-98.384280	1312		Middle Trinity				RF	24-Apr-18	164.65	2	1149.35		
Stanton Well	5753305		BPGCD	30.235556	-98.384444	1445		Middle Trinity				RF	19-Apr-18	219.6	0.5	1225.9		
Anne Wynn Well		57613S1	BPGCD	30.122280	-98.386140	1348		Middle Trinity				RF	19-Apr-18	115.6	1.8	1234.2		
Walter's Spring	6805617	295531098232401	USGS Springs DB	29.925278	-98.390000	1120		218GLRSL								1120		
Putter Creek Springs	6805618	295538098233101	USGS Springs DB	29.927222	-98.391944	1120		218GLRSL								1120		
Pedernales			Meadows	30.284652	-98.392740											1100	Wierman et al., 2017	
Rockin J Ranch Monitor Well 2		57616JA	BPGCD	30.042550	-98.394390	1438		Middle Trinity				RF	18-Apr-18	262.7	2	1177.3		
Amil Baker Well	5753614		BPGCD	30.177500	-98.395000	1510		Middle Trinity				RF	19-Apr-18	301.2	1.5	1210.3		
Rockin J Ranch Monitor Well 4		57616J2	BPGCD	30.046920	-98.400610	1385		Middle Trinity				RF	18-Apr-18	211	3.2	1177.2		
Quaid Haack Well		57619QH	BPGCD	30.031720	-98.406590	1395		Middle Trinity				RF	30-Apr-18	227.4	2.2	1169.8		Well is likely completed at the base of the Kgrl. Water level track within a few feet of the Whit Hanks well on Creek Road, with a differential of +135
Blanco County Yard Monitor Well		57612MW	BPGCD	30.088830	-98.417610	1335		Middle Trinity				RF	18-Apr-18	73.2	2.4	1264.2		
Dale A. Crenwelge / Tom Blevins Well		57538DC	BPGCD	30.141470	-98.419470	1730		Middle Trinity				RF	28-Apr-18	511.7	1.7	1220		
Jason Wheeler New Well 2018		57538JW	BPGCD	30.138420	-98.424500	1530		Middle Trinity				RF	30-Apr-18	313.4	2	1218.6		
Melissa Weisbrich	68052MW		BPGCD--2009	29.970083	-98.428111	1455		Middle Trinity		345		RF	18-Feb-09	245.22	1.5	1211.28		

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City of Blanco River Well	5761217		BPGCD	30.094440	-98.432220	1321		Middle Trinity				RF	18-Apr-18	71.8	4	1253.2		slotted 710 to 790. John Wilson renting red house, 717-419-6271
Rosa Winn Well	5761507		BPGCD	30.083528	-98.444611	1423		Middle Trinity				RF	18-Apr-17	91.28	1	1332.72		
Bamberger Ranch	57535BA		BPGCD--2009	30.206083	-98.449083	1605		Middle Trinity		340		RF	10-Apr-09	294.82	0.2	1310.38	Main Ranch House Well, unused	
Trey Haack North Pasture Well		57619TC	BPGCD	30.069639	-98.461000	1490		Middle Trinity				RF	30-Apr-18	125.7	2.2	1366.5		
Edge Falls Spring 4	6804904	295447098302101	USGS Springs DB	29.913056	-98.505833	1093		218GLRSL								1093		
Kendalia VFD	6804313	767	CCGCD	29.968611	-98.521389	1386.42		Middle Trinity		350			28-Mar-18	153		1233.42		
BJ Sultemeier	57526BJ		BPGCD--2009	30.201139	-98.524222	1545		Middle Trinity		325		RF	24-Feb-09	161.78	2	1385.22		
TWDB_Kendalia	6804312		TWDB	29.970277	-98.525277	1367		Middle Trinity (Cow Creek)		310	transducer	TWDB	17-Apr-18	128.78		1238.22	https://waterdatafortexas.org/groundwater/well/6804312	
BKS Estate Trust	6804312	2754	CCGCD	29.970278	-98.525278	1373.17		Middle Trinity		310			23-Apr-18	129.37		1243.8	https://waterdatafortexas.org/groundwater/well/6804312	
Rhoden	5760609		BSEACD	30.077953	-98.526208	1482		Middle Trinity(Cow Creek)	Eric and Jill Rhoden	300	eline	BH/MOG	25-Apr-18	45.4	0.8	1437.4		
RB-68-04-607	6804607	295640098314301	USGS Springs DB	29.944444	-98.528611	1205		218GLRSL								1205		
		R -00343	HCUWCD	30.213333	-98.603139			Middle Trinity--Hensel				PT	17-Apr-18			1490.1		
		R -00343	HCUWCD	30.213333	-98.603139			Middle Trinity--Hensel				PT	17-Apr-18			1388.1		
Hale Barn			BSEACD	30.110512	-98.630806	1680		Middle Trinity?	Chris Hale		eline	BH/MOG	25-Apr-18	316.7	0.7	1364	sonic 319	
RB-68-03-606	6803606	295605098395101	USGS Springs DB	29.934722	-98.664167	1200		218GLRSL								1200	Reported ceased flowing in 1956.	
		R -01006	HCUWCD	30.208500	-98.702111			Middle Trinity--Hensel				PT	17-Apr-18			1744.4		
	5751508	R -01153	HCUWCD	30.190361	-98.703139			Middle Trinity--Hensel				PT	17-Apr-18			1512.6		
Sisterdale VFD	6803109	315	CCGCD	29.975556	-98.721111	1294.58		Middle Trinity		200			28-Mar-18	43.75		1250.83		
	5750901	ER-02608	HCUWCD	30.162556	-98.784000			Middle Trinity--Hensel				PT	17-Apr-18			1477.8		
		R -01017	HCUWCD	30.325222	-98.802944			Middle Trinity--Hensel				PT	12-Apr-18			1644.7		
		R -00511	HCUWCD	30.271778	-98.817139			Middle Trinity--Hensel				PT	12-Apr-18			1624.6		

Name	SWN	Other_ID	Source	Ddlat	Ddlong	Surface_Elevation	Surface_Elev_new	Aquifer	Owner	Well_depth	Equipment	Staff	2018_Date	2018_DTW	MP	2018_WL_Elev	Comment_	Notes
		ER-01851	HCUWCD	30.348833	-98.821778			Middle Trinity--Hensel				PT	12-Apr-18			1766.2		
		R -00876	HCUWCD	30.306806	-98.826667			Middle Trinity--Hensel				PT	12-Apr-18			1634.6		
		GL-00159	HCUWCD	30.280639	-98.827778			Middle Trinity--Hensel				PT	16-Apr-18			1632.2		
		GL-00001	HCUWCD	30.249500	-98.838167			Middle Trinity--Hensel				PT	16-Apr-18			1604.1		
		R -00888	HCUWCD	30.324444	-98.841389			Middle Trinity--Hensel				PT	12-Apr-18			1649.2		
David Langford	5758402	6233	CCGCD	30.076896	-98.843075	1585.58		Middle Trinity		315			28-Mar-18	172.85		1412.73		
		ER-01740	HCUWCD	30.250639	-98.855278			Middle Trinity--Hensel				PT	16-Apr-18			1607.6		
		R -01168	HCUWCD	30.198861	-98.866000			Middle Trinity--Hensel				PT	16-Apr-18			1584.7		
		R -00940	HCUWCD	30.248139	-98.870694			Middle Trinity--Hensel				PT	16-Apr-18			1640.6		
		PL-00064	HCUWCD	30.226417	-98.874972			Middle Trinity--Hensel				PT	16-Apr-18			1564.8		
		R -00968	HCUWCD	30.182361	-98.882417			Middle Trinity--Hensel				PT	16-Apr-18			1597.8		
Comfort TWDB	6801314	7480	CCGCD	29.971944	-98.894778	1405		Middle Trinity		280			23-Apr-18	156.91		1248.09		
		R -00163	HCUWCD	30.289694	-98.894806			Middle Trinity--Hensel				PT	16-Apr-18			1712.5		
		R -01915	HCUWCD	30.255167	-98.906500			Middle Trinity--Hensel				PT	10-Apr-18			1664.1		
		ER-00099	HCUWCD	30.269083	-98.910528			Middle Trinity--Hensel				PT	10-Apr-18			1715.6		
		ER-01467	HCUWCD	30.255028	-98.911167			Middle Trinity--Hensel				PT	10-Apr-18			1659.7		
		R -01205	HCUWCD	30.280556	-98.912222			Middle Trinity--Hensel				PT	16-Apr-18			1726.1		
		R -00238	HCUWCD	30.198694	-98.927583			Middle Trinity--Hensel				PT	10-Apr-18			1588.9		
		R -00053	HCUWCD	30.246056	-98.935389			Middle Trinity--Hensel				PT	10-Apr-18			1669		
		ER-01777	HCUWCD	30.152806	-98.961639			Middle Trinity--Hensel				PT	10-Apr-18			1620.95		
		ER-02077	HCUWCD	30.325833	-98.967667			Middle Trinity--Hensel				PT	16-Apr-18			1787.2		

Name	SWN	Other_ID	Source	Ddlat	Ddlong	Surface_Elevation	Surface_Elev_new	Aquifer	Owner	Well_depth	Equipment	Staff	2018_Date	2018_DTW	MP	2018_WL_Elev	Comment_	Notes
		R -01147	HCUWCD	30.196111	-99.010000			Middle Trinity--Hensel				PT	10-Apr-18			1657.5		
		R -00035	HCUWCD	30.140611	-99.032444			Middle Trinity--Hensel				PT	10-Apr-18			1643.8		
		R -00895	HCUWCD	30.158306	-99.032472			Middle Trinity--Hensel				PT	10-Apr-18			1643.4		
		ER-00643	HCUWCD	30.297694	-99.070639			Middle Trinity--Hensel				PT	10-Apr-18			1707.6		
		R -00566	HCUWCD	30.205694	-99.105056			Middle Trinity--Hensel				PT	10-Apr-18			1683.5		
		R -00209	HCUWCD	30.251944	-99.126667			Middle Trinity--Hensel				PT	10-Apr-18			1705		
		PM-00005	HCUWCD	30.216333	-99.139722			Middle Trinity--Hensel				PT	10-Apr-18			1703.4		
		R -00785	HCUWCD	30.281111	-99.149167			Middle Trinity--Hensel				PT	10-Apr-18			1713.9		
		R -00173	HCUWCD	30.169139	-99.150833			Middle Trinity--Hensel				PT	10-Apr-18			1689.9		
		R -01171	HCUWCD	30.140278	-99.153889			Middle Trinity--Hensel				PT	10-Apr-18			1604.7		

Appendix 3: 2009 Middle Trinity Potentiometric Data (from Hunt et al., 2010).

SWN	DDLong	DDLat	Date_	LSD_Elev	Meas_WL	MPH	WL_Elev
6805209	-98.427944	29.991278	2/18/2009	1390	128.90	2.00	1263.10
57469SH	-98.279361	30.259417	3/9/2009	1078	82.14	1.50	997.36
57529D1	-98.512694	30.130861	2/26/2009	1518	145.31	2.00	1374.69
57549GG	-98.269722	30.141806	3/7/2009	1548	499.45	1.90	1050.45
57603HH	-98.534111	30.094806	2/26/2009	1512	93.79	1.00	1419.21
57617RH	-98.484570	30.027960	2/22/2009	1502	72.30	1.00	1430.70
57626ER	-98.288778	30.079250	3/6/2009	1253	225.00	1.50	1029.50
6802508	-98.803889	29.950000	3/17/2009	1340	91.70	-1.67	1249.97
6802609	-98.788611	29.930000	3/17/2009	1355	121.25	-1.25	1235.00
6803804	-98.706944	29.890833	3/17/2009	1431	200.10	-1.50	1232.40
6804705	-98.620556	29.896389	3/17/2009	1280	179.00	-1.58	1102.58
6804809	-98.557222	29.889167	3/17/2009	1121	73.40	-1.50	1049.10
6811302	-98.625000	29.858611	3/17/2009	1308	167.40	-1.33	1141.93
6812106	-98.598333	29.854444	3/17/2009	1234	102.20	-0.83	1132.63
#79167	-98.836389	29.920278	3/17/2009	1606	346.30	-2.67	1262.37
5663305	-99.148222	30.099139	3/30/2009	1785	250.05	0.00	1534.95
5664711	-99.112667	30.009333	3/26/2009	1576	198.60	0.00	1377.40
5757703	-98.972778	30.019444	3/30/2009	1565	124.90	0.00	1440.10
6801703	-98.972917	29.906944	3/27/2009	1525	209.30	0.00	1315.70
6908305	-99.024028	29.988389	3/26/2009	1662	279.00	0.00	1383.00
6908624	-99.024583	29.936778	3/27/2009	1525	182.80	0.00	1342.20
57559	-98.137199	30.130867	2/13/2009	1240	255.25	1.08	985.34
5763903, G1050039B	-98.156196	30.039252	2/18/2009	1033	121.00	2.57	914.53
Holbrook	-98.105892	30.043739	2/19/2009	1058	149.90	1.88	909.75
Warner	-98.138816	30.057818	2/18/2009	1136	219.58	0.79	917.19
6815116	-98.213056	29.848611	2/14/2009	1010	138.26	0.00	871.74
6821213	-98.422221	29.719443	2/15/2009	1100	301.00	0.00	799.00
6821902	-98.385277	29.662777	3/15/2009	968	296.86	0.00	671.14

Appendix 4: Middle Trinity Springs (from TWDB groundwater database).

Name	site_no	state_well	dec_lat_va	dec_long_v	alt_va	aquifer_cd	remarks
Swede Creek Springs	295153098350901	6812101	29.864722	-98.585833	1140	218GLRSL	
Sultenfuss Spring	295203098344801	6812201	29.867500	-98.580000	1185	218GLRSL	
Cave Without a Name	295311098370301	6804701	29.886389	-98.617500	1130	218GLRSL	
RB-68-02-605	295552098465601	6802605	29.931111	-98.782222	1315	218GLRSL	
Buchanan Ranch Spring	300216098143701	5763704	30.037778	-98.243611	1132	218GLRSL	
Cove Branch Creek Spring	300400098204801	5762403	30.066667	-98.346667	1260	218GLRSL	
Cold Spring	300530098241101	5761304	30.091667	-98.403056	1280	218GLRSL	
AZ-57-54-401	301137098200901	5754401	30.193611	-98.335833	1150	218GLRSL	
Mill Seat Spring	301220098210901	5754402	30.205556	-98.352500	1160	218GLRSL	
AZ-57-55-107	301438098145401	5755107	30.243889	-98.248333	1060	218GLRSL	
Oak Spring	301500098240701	5753317	30.250000	-98.401944	1300	218GLRSL	
Hammett's Spring	302029098083801	5747304	30.341389	-98.143889	805	218GLRSL	Well B-38 in 1957 Travis County report.
Santa Monica Springs	302036097532001	5841306	30.343333	-97.888889	480	218GLRSL	It is now beneath Lake Austin.
Hamilton Springs	302036098072801	5748105	30.343333	-98.124444	805	218GLRSL	
AZ-57-45-303	302111098232201	5745303	30.353056	-98.389444	1270	218GLRSL	