Report of Findings: WRGS 21-010

Report of Findings
Mystic Mountain Ranch
Groundwater Availability Certification for Platting: Comanche County, Texas

For:
Lone Star Land Partners, LLC.
P.O. Box 1987
Marble Falls, TX 78654

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August 2021

WRGS Project No. 083-002-21

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The seal appearing on this document was authorized by Kaveh Khorzad, P.G. 1126 on August 6, 2021:

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Wet Rock Groundwater Services, LLC
TBPG Firm Registration No. 50038

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Section I: Introduction

This report details the results of a groundwater availability study for the proposed Mystic Mountain Ranch Subdivision (Mystic Mountain) to meet the requirements of the Certification of Groundwater Availability for Platting Form *(Title 30, Texas Administrative Code, Chapter 230, Sections 230.2 through and including 230.11)*. Appendix A provides the completed Certification of Groundwater Availability for Platting Form.

Mystic Mountain is located along Farm to Market (FM) 1702 approximately 4.5 miles southeast of the City of Gustine in southeastern Comanche County (Figure 1). The proposed subdivision is documented within the Comanche County Tax Assessor as Property ID: 9559. Lone Star Land Partners, LLC (P.O. Box 1987, Marble Falls, TX 78654) is the plat applicant.

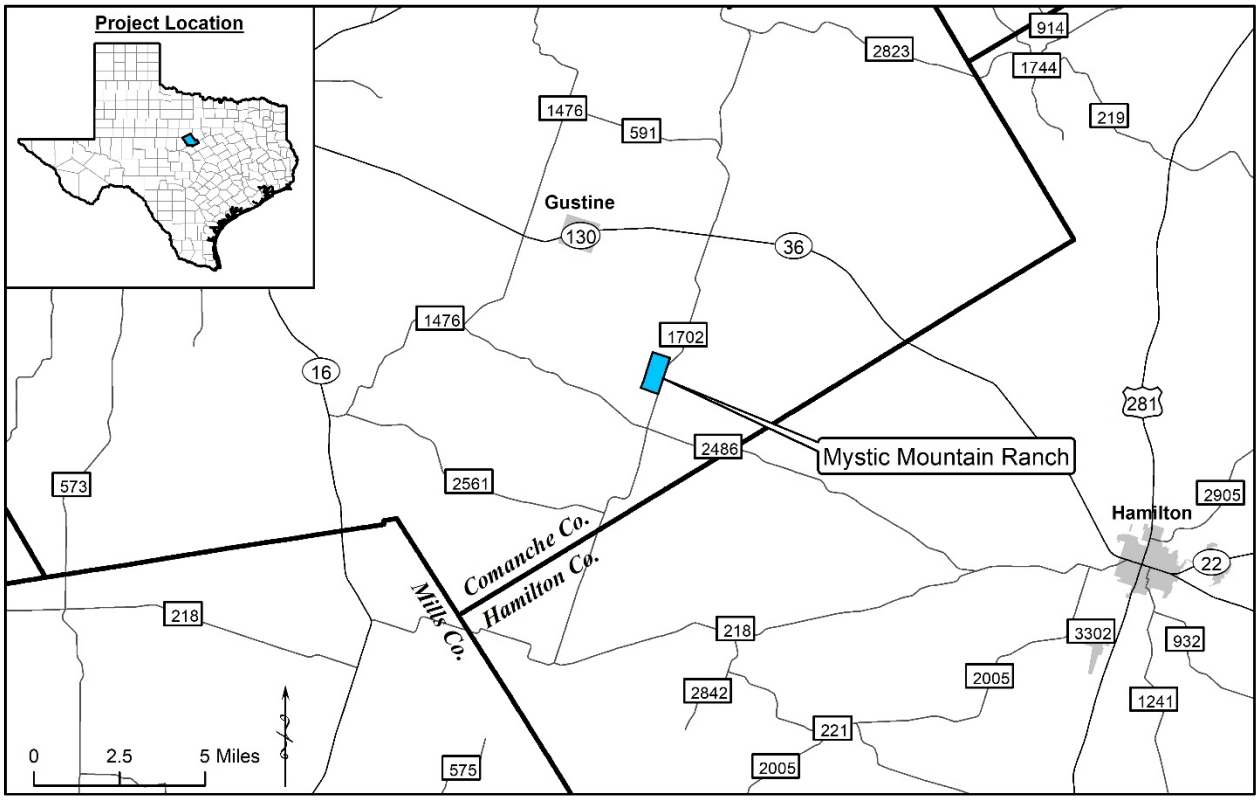


Figure 1: Location map

Lone Star Land Partners, LLC proposes to develop the approximately 375.57 acre property as a subdivision including 17 single family residential lots. The average lot size is 22.1 acres; each lot will be served by an individual water well. The subdivision is located within the jurisdiction of the Middle Trinity Groundwater Conservation District (CTGCD). Figure 2 provides a map showing the general location of the subdivision with the county and groundwater district boundaries.

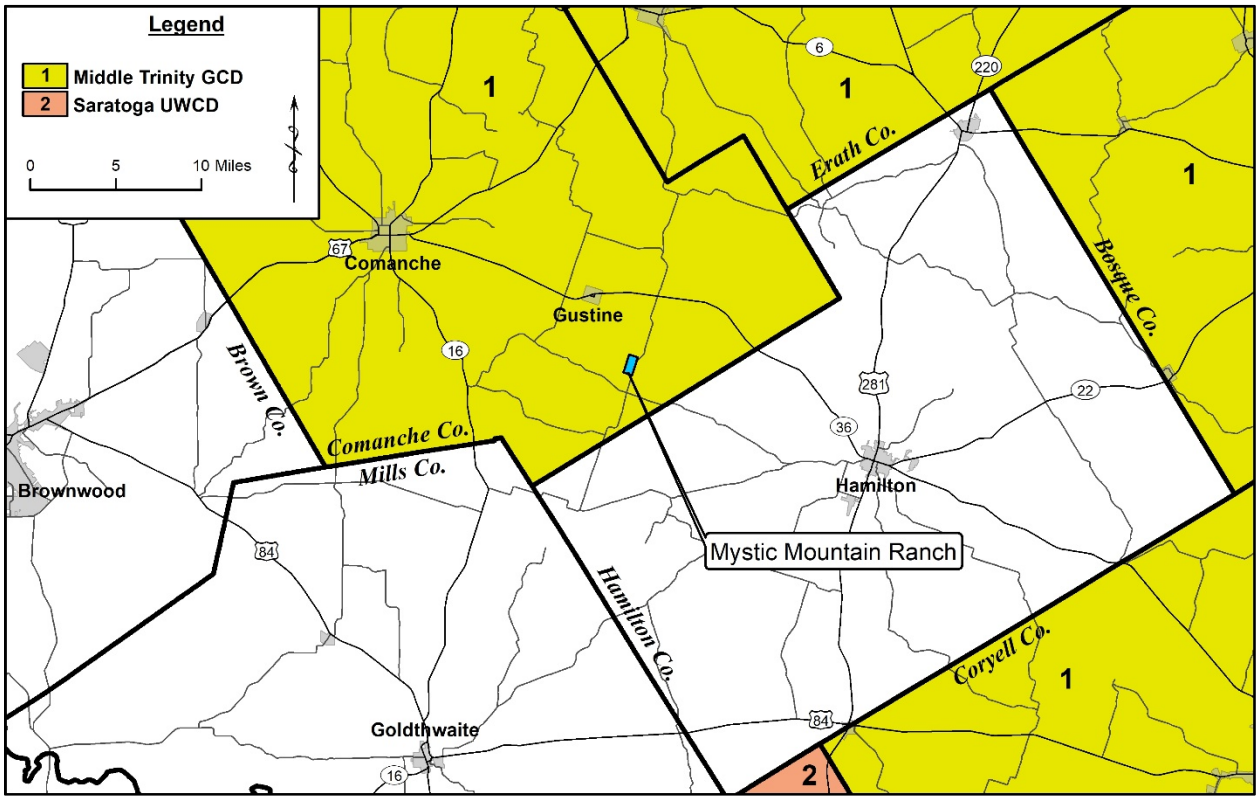


Figure 2: Groundwater Conservation District map

Section II: Projected Water Demand Estimate

To estimate the water demand within the proposed subdivision, US Census data (2.43 persons per household) and per capita water use estimates (103 gallons per person per day; gpd) from the Texas Water Development Board (TWDB) were utilized.

Equation 1: Total Water Demand

$$Q_s = n \times 2.43 \times 103 \times 365 \text{ days} = 1{,}553{,}049.45 \text{ gallons/year or } 4.8 \text{ acre-feet/year}$$

Where:

Q_s = Total Water Demand at full build out for the subdivision;

n = Number of lots (17 lots);

2.43 = Average number of persons per household; and

103 = The average per capita usage of water per day in gallons.

Equation 2: Water Demand per Housing Unit

$$Q_h = 2.43 \times 103 \times 365 \text{ days} = 91{,}355.85 \text{ gallons/year or } 0.28 \text{ acre-feet/year}$$

Where:

Q_h = Total Water Demand per house per year

Equation 1 assumes 2.43 persons per household using 103 gallons per person per day which results in a total water demand for the subdivision of 4.8 acre-feet/year. Equation 2 results in a water demand per housing unit of 0.28 acre-feet/year. There are no planned non-residential water demands.

Section III: General Groundwater Resource Information

III.1. Introduction

According to the Texas Water Development Board (TWDB), there is one (1) major aquifer (Trinity Aquifer) that supplies groundwater within the study area. The TWDB classifies major aquifers as aquifers that produce large amounts of water over large areas, and minor aquifers as aquifers that produce minor amounts of water over large areas or large amounts of water over small areas. The Trinity Aquifer is part of a thick and regionally extensive aquifer system composed of Cretaceous carbonates and clastics that were deposited throughout north, central and south Texas and is classified as a major aquifer.

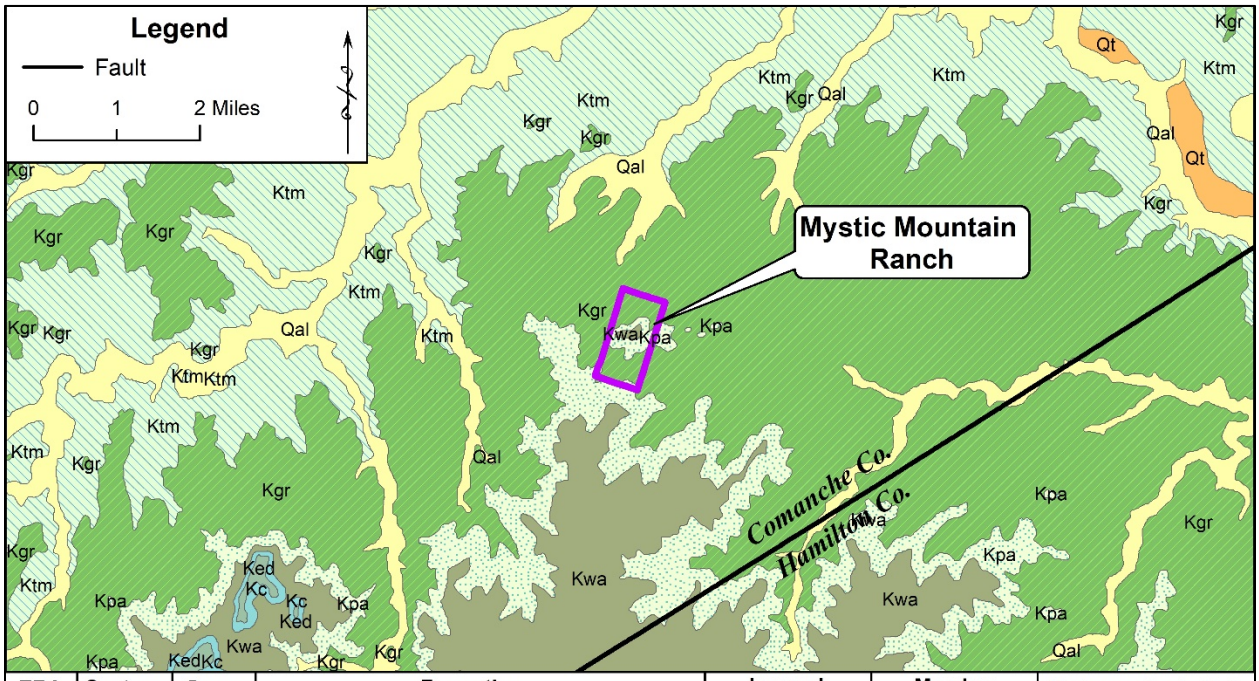
III.2. Stratigraphy and Geologic History

The surface geology consists of the Trinity and Fredericksburg Groups, which were deposited approximately 140 million years ago by a Cretaceous-aged sea that once dominated the interior of North America and the Gulf Coast region. For approximately 79 million years, this shallow sea deposited the sediments that now make up the property and its surrounding area. Figure 3 provides a geologic map and stratigraphic column illustrating the geology surrounding the proposed subdivision. In the study area, the Trinity Group is divided into three geologic formations from oldest to youngest: Twin Mountains Formation, Glen Rose Formation, and Paluxy Formation (Kelly and others, 2014).

The Twin Mountains Formation is mainly comprised of shale, sand, and limestone and is generally grouped as one formation. To the south and east, the formation is separated from oldest to youngest into the Hosston and Sligo members (Lower Trinity Aquifer), Hammett Shale (aquitard), and the Cow Creek Limestone and Hensell Sand (part of the Middle Trinity Aquifer). The older Hosston member of the Twin Mountains Formation was deposited around the same geologic time; however, its composition varies due to depositional localities. The Hosston Member was deposited in a fluvial coastal setting (Kelly and others, 2014).

Above the Twin Mountains Formation is the Glen Rose Limestone, which is separated into Upper and Lower members to the south and east of the study area (Figure 3). This limestone formation was deposited in a shallow marine shelf environment that was extensive in nature (Kelly and others, 2014). The Glen Rose Limestone generally consists of alternating layers of limestone and dolomite found at the top of the formation; massive limestone layers are found near the base. Above the Glen Rose Limestone is the Paluxy Sand, which is also part of the Upper Trinity Aquifer (Jones, 2003; Figure 3).

Above the Trinity Group lies the Fredericksburg Group that make up the Edwards Aquifer. The Fredericksburg Group is separated from the Paluxy Formation by the oldest member of the Fredericksburg Group known as the Walnut Formation (confining unit; Figure 3). The Comanche Peak Limestone, Edwards Limestone and Kiamichi Formation make up the Fredericksburg Group within the Edwards Aquifer. The Glen Rose Limestone Formation covers the majority of the surface at Mystic Mountain; however, in the central portion of the property, the Paluxy and Walnut Clay Formations are found (Figure 3).



ERA	System	Group	Formation	Legend	Member	Hydrogeologic Unit
Cenozoic	Quaternary		Pleistocene to Recent floodplain (alluvium and fluviatile terrace deposits)	Qa (Qt, Qc, Qcf)		localized alluvial aquifers
Mesozoic	Cretaceous	Navarro		Knt		confining units
		Taylor				
		Austin		Kau		
		Eagle Ford		Kef		
		Wood bine	Lewisville	Kwb		Woodbine Aquifer
			Dexter			
		Washita	Buda/Del Rio	Kbu / Kdr		
			Georgetown	Kgt		
		Fredericksburg	Kiamichi	Kki		
			Edwards	Ked		
			Comanche Peak	Kc		
			Walnut Clay	Kwa		confining unit
		Trinity	Paluxy	Kpa		Trinity Aquifer
			Glen Rose	Kgr		
			Twin Mountains	Ktm	Hensell	
					Pearsall	
					Hosston	

Figure 3: Geologic map (modified from Kelly and others, 2014)

III.3. Hydrogeology

The main source of groundwater in the area near the proposed subdivision is the Trinity Aquifer. The formations comprising the Trinity Aquifer become thicker downdip (southeast) approaching the Balcones Fault Zone to the south (Ashworth, 1983). The Northern Trinity Aquifer spans from the south at the Colorado River up north into Oklahoma and Arkansas where fresh water can be produced. Figure 4 shows the location of the Trinity Aquifer with respect to other aquifers in the area. The solid green portion reflects the unconfined zone of the Trinity Aquifer where recharge occurs; the hatched green portion reflects the confined zone of the Trinity Aquifer.

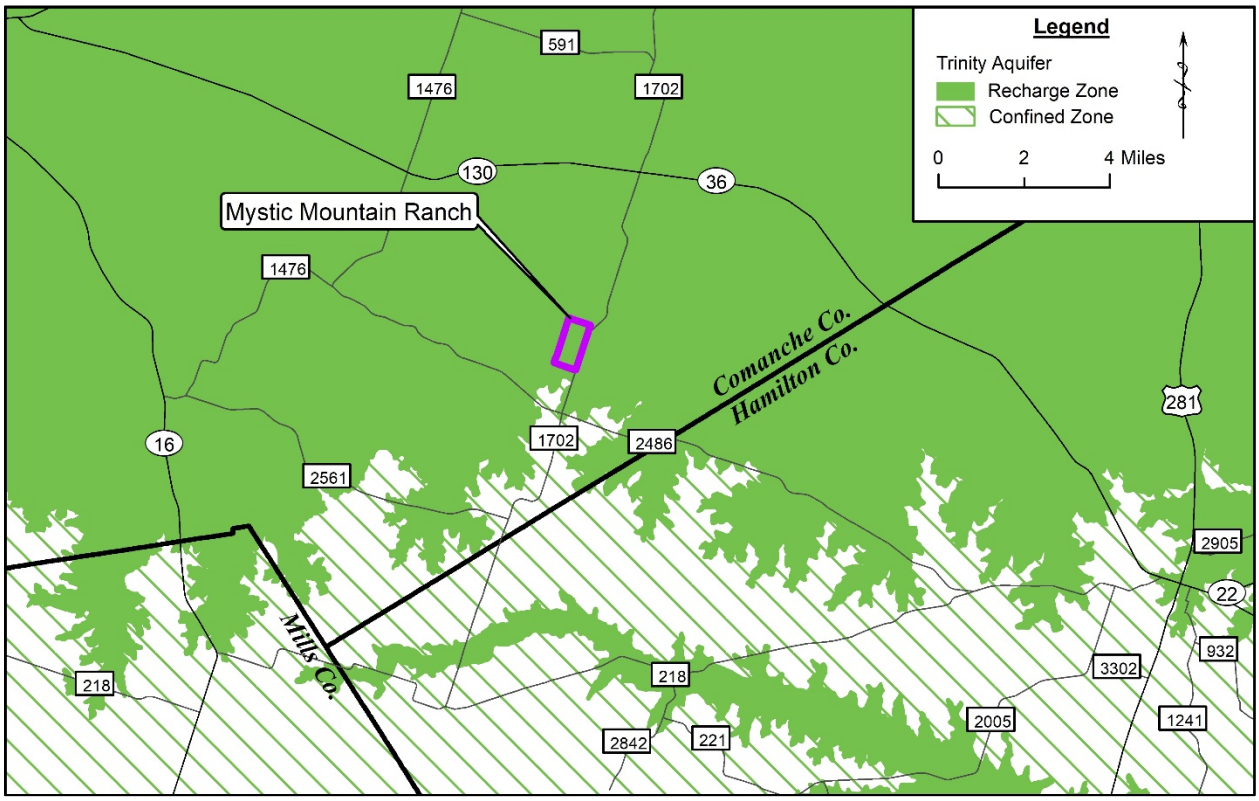


Figure 4: Aquifer map

The Trinity Aquifer exhibits variable yield and quality throughout the north and central Texas area. The quantity of water an aquifer yields depends upon its ability to store and transmit water. The water quality of a well completed within the Trinity Aquifer depends upon several factors, including the degree of fracturing, sand thickness and permeability, the amount of time the groundwater is in contact with the rock formation it is flowing through, and the minerals that compose the rock. For example, groundwater that flows through gypsum and anhydrite beds, which are composed of calcium sulfate ($CaSO_4$), will typically contain elevated levels of sulfate (Ashworth, 1983).

The most permeable portions of the Trinity Aquifer near Mystic Mountain are to the southeast near Waco (Baker and others, 1990). In these area, the sands within the aquifer are either less calcareous or have very large saturated thicknesses. Typically, the Hosston Member of the Twin Mountains Formation is the highest yielding strata of the Trinity Aquifer.

Most all of the wells in the area near Mystic Mountain are completed in the Trinity Aquifer and completed within the Twin Mountains Formation due to the consistent supply of groundwater that generally meets drinking water standards. The Paluxy and Glen Rose formations typically produce lower quantities of water due to thinner sections of these formations in the area.

Section IV: Aquifer Testing

IV.1. Well Details

There are a total of two (2) wells located within the proposed subdivision that were used in this study; Well No. 1 is an existing well drilled in January 2021 and Well No. 2 is a newly constructed well by Texan Water within the Trinity Aquifer. Figure 5 provides a map showing the locations of the Mystic Mountain's wells along with all documented wells within one mile of the property boundary. Figure 6 provides well profiles displaying well construction and formation depths that were determined from the drill cuttings collected by Texan Water, state well reports and geophysical logs; Appendix B provides available state well reports. Table 1 provides a summary of the existing wells according to TWDB well data within 1-mile of the subdivision not used in testing; Table 2 provides a well construction summary for wells used in the testing.

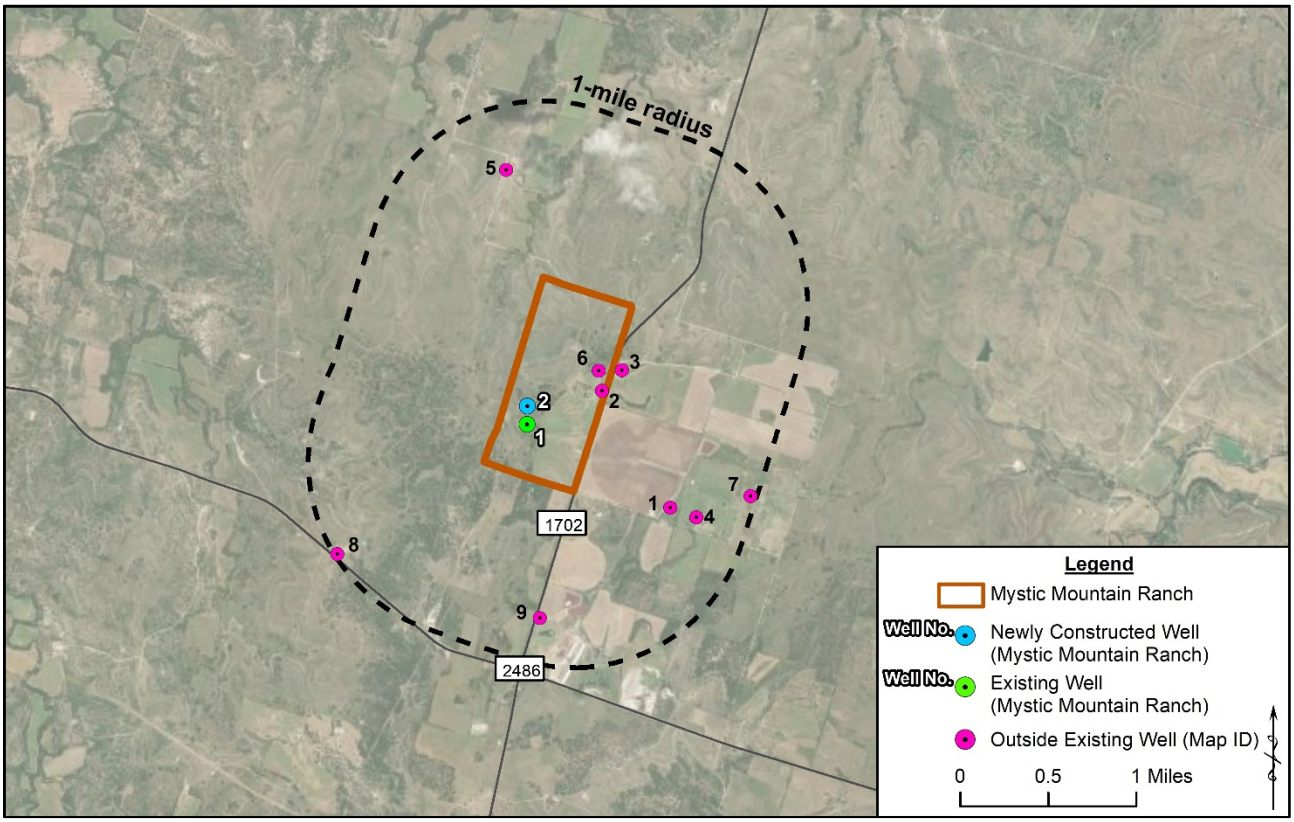


Figure 5: Well location map

Table 1: Summary of wells within 1-mile of the subdivision

Map ID	State Well ID	Owner	Well Depth (ft.)	Well Type
1	4114703	Isham & Son Dairy	15	Unused
2	4114705	M.O. Dingler	260	Domestic
3	4114704	Mrs. Aamon Morgan	270	Stock

4	4114701	Gayle Isham, Jr.	335	Domestic
5	3876	Robert D. Collier	210	Domestic
6	3879	Robert D. Collier	330	Domestic
7	95356	Ester Martinez	380	Domestic
8	113690	Jack Pettit	310	Domestic
9	167578	Frank Brand	437	Domestic

To meet the guidelines for the Comanche County development rules and regulations and to adequately assess the availability of groundwater within the vicinity of the proposed subdivision, one (1) aquifer test was conducted. The aquifer test consisted of pumping one well for at least 24 hours followed by a recovery phase while measuring water levels in both the pumping and observation wells. This is in accordance with the testing procedures of the Texas Administrative Code (TAC) Title 30 Part 1 Chapter 230.8. Based on the state well reports, drillers' lithology logs, and geophysical logs conducted by GeoCam, Inc. on Well No. 2, all wells used in the aquifer testing are completed in the Trinity Aquifer. The following provides a summary of the well construction for the wells used in the test:

Well No. 1

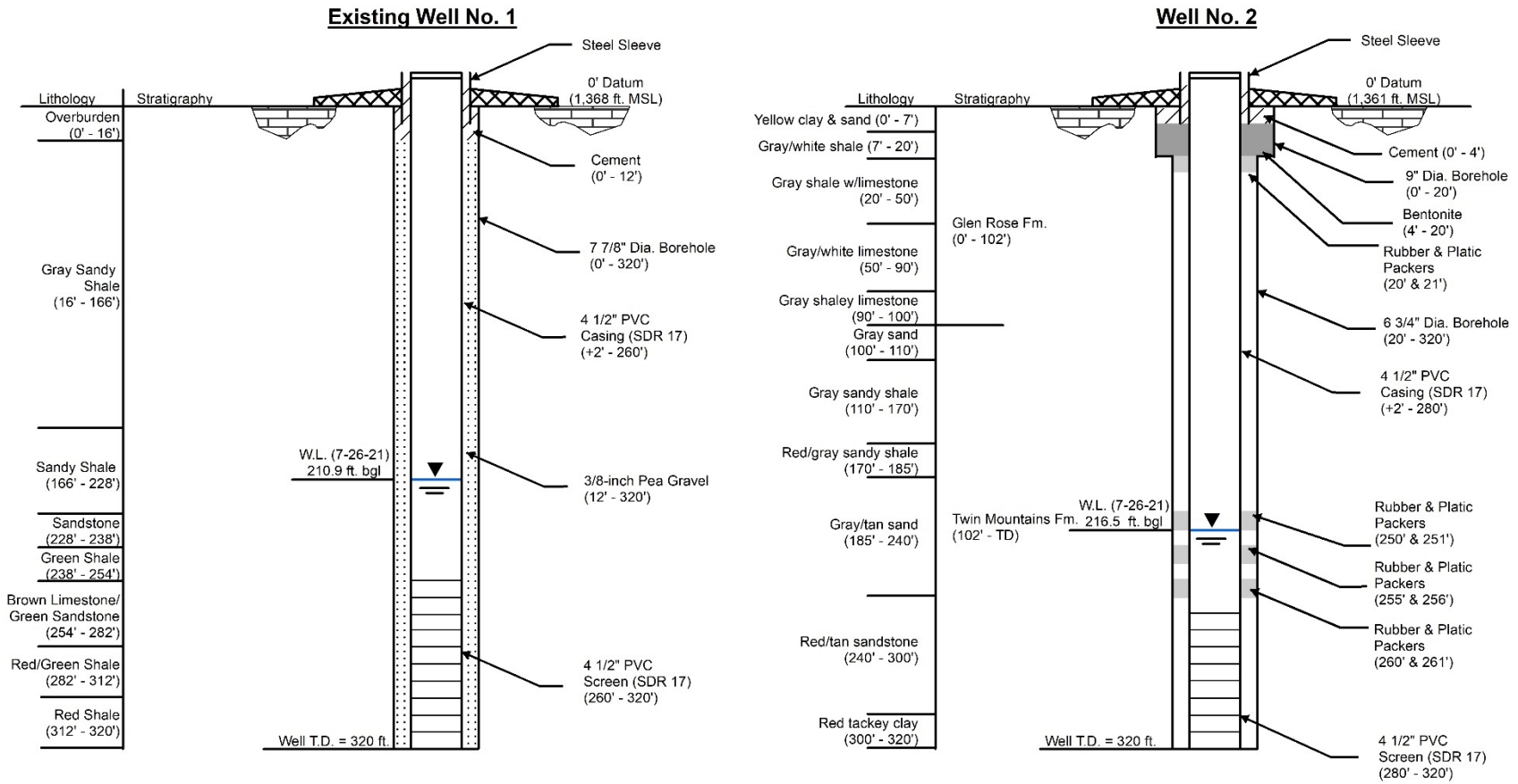
According to the State Well Report (Tracking No. 577466; Appendix C), Well No. 1 was completed by Alderson Water Well Rescue, LLC on January 27, 2021. The well was drilled to a total depth of 320 feet below ground level (ft. bgl) with an 7 7/8-inch borehole from 0 to 320 ft. bgl. The well was completed with 4 1/2-inch PVC casing set from +2 to 260 ft. bgl, and 4 1/2-inch PVC screen from 260 to 320 ft. bgl. According to the driller's lithology log and geophysical logs, the well was completed in the Twin Mountains Formation of the Trinity Aquifer. According to the well report, the well was jetted at an estimated rate of 10 gallons per minute (gpm) upon completion (Figure 6; Appendix C).

Well No. 2

According to the State Well Report (Tracking No. 579269; Appendix C), Well No. 2 was completed by Texan Water on July 20, 2021. The well was drilled to a total depth of 320 ft. bgl with a 9-inch borehole from 0 to 20 ft. bgl and a 6 3/4-inch borehole from 20 to 320 ft. bgl. The well was completed with 4 1/2-inch PVC casing set from +2 to 280 ft. bgl, and 4 1/2-inch PVC screen from 280 to 320 ft. bgl. According to the driller's lithology log and geophysical logs, the well was completed in the Twin Mountains Formation of the Trinity Aquifer. According to the well report, the well was jetted at an estimated rate of 20 gpm upon completion (Figure 6; Appendix C).

Table 2: Summary of Mystic Mountain Ranch well construction

Well	Tracking No.	Latitude	Longitude	Elev. (ft. MSL)	Date Completed	Aquifer	Well Depth (ft. bgl)	Static Water Level (ft. bgl; date; ft. MSL)	Borehole (diameter; ft. bgl)	Casing (diameter; material; ft. bgl)	Screen (diameter; material; ft. bgl)
Well No. 1	577466	30° 47' 00" N	98° 22' 05" W	1,368	1-27-21	Trinity	320	210.9 (7-26-21) 1,157.1	7 7/8" (0-320)	4 1/2" PVC (+2-260)	4 1/2" PVC Screen (260-320)
Well No. 2	579269	31° 47' 11" N	98° 21' 38.9" W	1,361	7-20-21	Trinity	320	216.5 (7-26-21) 1,144.5	9" (0-20) 6 3/4" (20-320)	4 1/2" PVC (+2-280)	4 1/2" PVC Screen (280-320)



Notes:
- Well profiles created with information from State Well Reports, drill cuttings and geophysical surveys (7-22-21).
- Figure for schematic purposes; not drawn to scale.

Figure 6: Well construction profiles of Wells No. 1 and No. 2

IV.2. Aquifer Testing

One (1) aquifer test was performed utilizing 2 wells to assess the hydrogeologic properties of the Trinity Aquifer within the proposed subdivision. The objective was to perform each aquifer test with a 24-hour pumping phase followed by a recovery phase in which the pumping well achieved 90% recovery. For each aquifer test, Texan Water set a submersible pump within the pumping well that was capable of varying its discharge rate. Prior to the start of the aquifer test, pressure transducers capable of measuring the water level and temperature at one-minute intervals were placed in the pumping and observation wells to gather data for the duration of the test. Flow meter readings and water levels were taken prior to, during, and at the conclusion of the test. The aquifer test had at least a 24-hour pumping phase followed by a recovery phase. The data from the aquifer test was analyzed using the Cooper-Jacob method. Table 3 provides a summary of the aquifer testing results; Appendix D provides the results of the aquifer analysis; and Appendix E provides the well efficiency calculation for Well No. 2.

IV.2.1. Aquifer Test of Well No. 2 (July 26, 2021)

The aquifer test of Well No. 2 (pumping well) was conducted on July 26, 2021 with Well No. 1 serving as the observation well approximately 490 feet away. A 1 1/2 horsepower (HP) submersible pump was set in the pumping well on 300 feet of 1 1/4-inch PVC column pipe. The pump was started at 10:12 A.M. on July 26, 2021; the water level was monitored for 24.12 hours of pumping and 24.00 hours of recovery. Prior to the pumping phase of the aquifer test, the static water level of the pumping well was measured at 216.5 ft. bgl (1,144.5 ft. MSL) and the static water level of the observation well was measured at 210.9 ft. bgl (1,157.1 ft. MSL). Figure 7 provides a hydrograph of the pumping well and temperature over the duration of the aquifer test; Figure 8 provides a hydrograph of both the pumping and observation wells over the duration of the test.

Well No. 2 was pumped at an initial rate of 23 gpm; however, in order to prevent the pumping level from reaching the pump, the discharge rate was reduced twice during the pumping phase. The rate was first reduced within two hours to 20 gpm and additionally at 4 hours to 18 gpm. The well produced at an average rate of 18 gpm over the 24-hour period and the final measured pumping rate was 17 gpm with 37.98 feet of drawdown, resulting in a specific capacity of 0.45 gpm/ft. When compared to the theoretical specific capacity (0.52 gpm/ft.), Well No. 2 exhibited an efficiency of 87%. The Cooper-Jacob analysis resulted in a transmissivity of 132.3 ft^2/day, and a hydraulic conductivity of 1.27 ft./day. A maximum drawdown of 0.61 feet was observed in Well No. 1, indicating a hydraulic connection between the two wells. Due to the observed hydraulic connection, we calculated a storativity value of 5.6×10^{-4} for Well No. 1.

The pumping level slowly decreased throughout the pumping phase reaching a steady water level just prior to shut off of the pump (Figure 7). The water level in the observation well displayed a slight observable response related to starting and stopping the pump in Well No. 2 (Figure 8). Texan Water staff increased the pump rate prior to turning the pump off in order to collect a water sample (Figure 7). After the pump was shut off, recovery was measured in both wells; the water level in the pumping well recovered 90% in approximately 90 minutes. There were no aquifer boundary conditions observed during the testing.

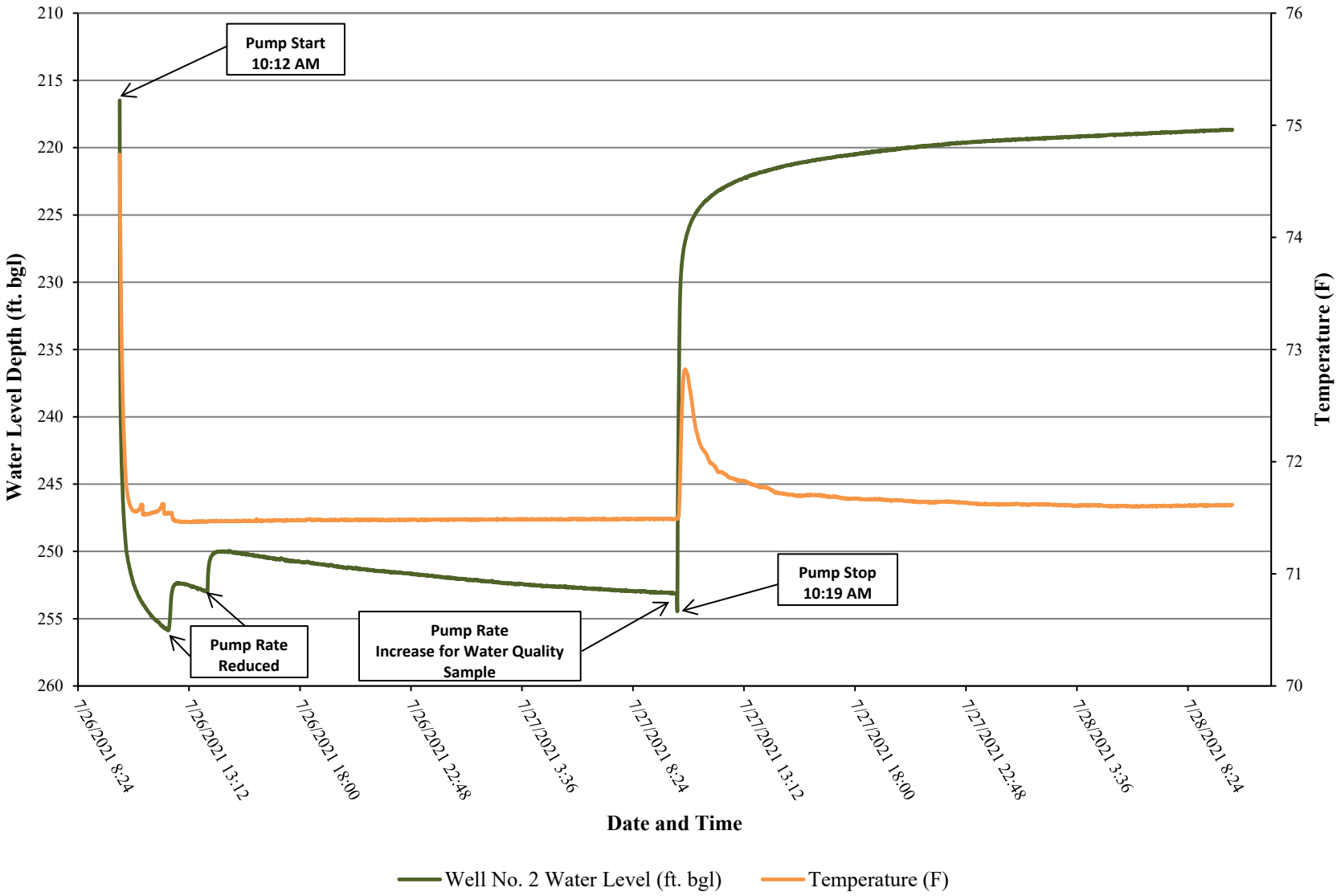


Figure 7: Aquifer test hydrograph of Well No. 2 (July 26, 2021)

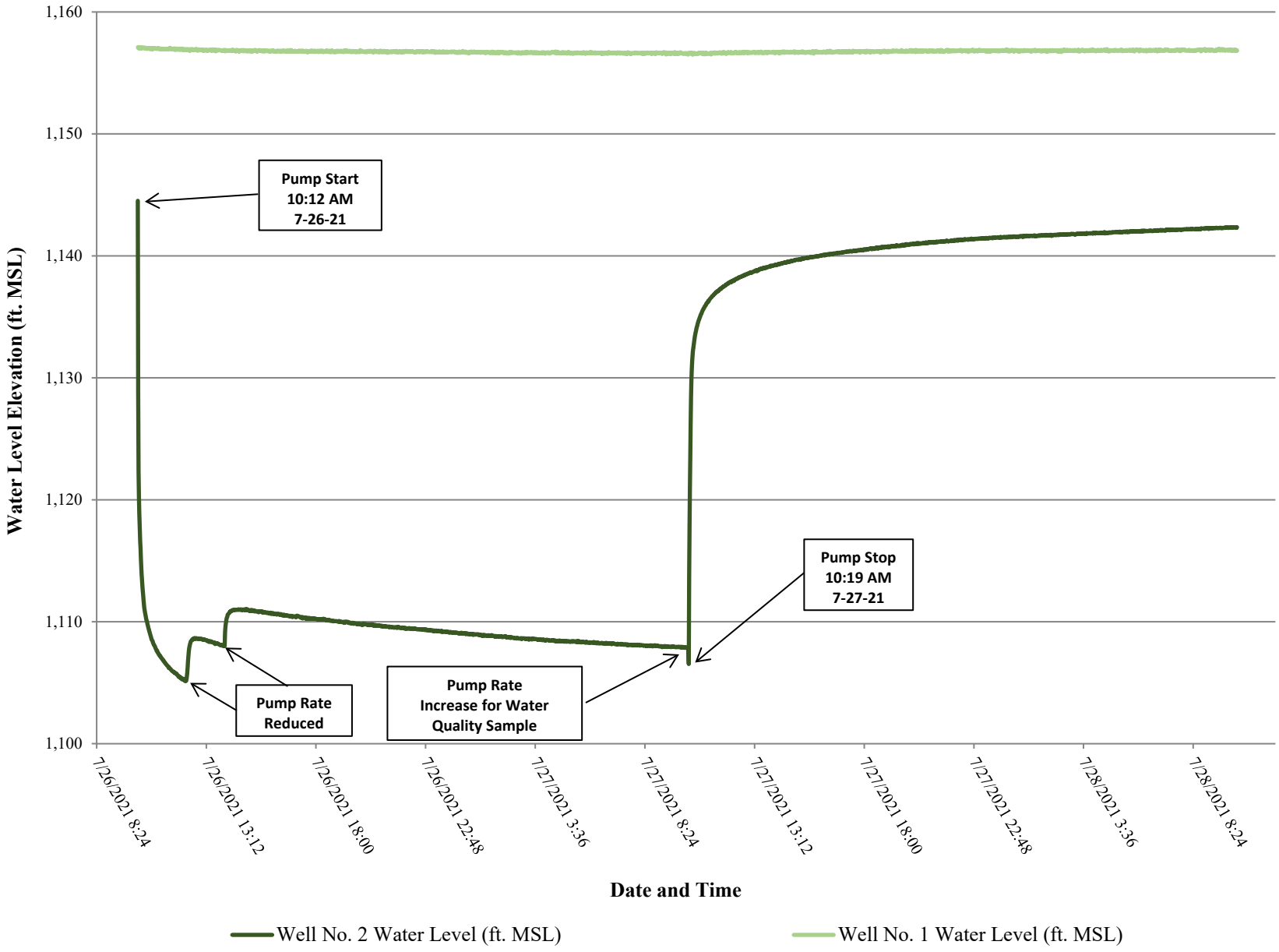


Figure 8: Aquifer test hydrograph of Well No. 2 and Observation Well No. 1 (July 26, 2021)

Table 3: Summary of aquifer test results

Date	Well	Average Pump Rate (gpm)	Final Pump Rate (gpm)	Drawdown (ft.)	Specific Capacity (gpm/ft.)	Transmissivity (ft^2/d)	Storativity	Hydraulic Conductivity (ft./d)	Well Efficiency	Aquifer Thickness (ft.)	Aquifer Boundary Detected
7/26/2021	PW No. 2	18	17	37.98	0.45	132.3	-	1.27	87%	104	No
	OW No. 1	-	-	0.61	-	-	5.59E-4	-	-	109	No

Note: PW = Pumping Well; OW = Observation Well; ft. = feet; gpm = gallons per minute; d = day; * = average storativity value

IV.3. Water Quality

A water quality sample was collected from the pumping well at the end of the 24-hour pumping phase of the aquifer test. The sample was collected by Texan Water staff in sealed containers and stored on ice in a cooler. The sample for Well No. 2 was transported to Pollution Control Services and was tested in accordance with Texas Administrative Code 230.9 (Determination of Groundwater Quality). Appendix F provides a copy of the water quality reports.

Table 4 provides the water quality summary of the sample. The results were compared to Texas Commission on Environmental Quality (TCEQ) Maximum Contaminant Levels (MCL) and Secondary Contaminant Levels (SCL). The results show that all constituents met the TCEQ MCLs and SCLs.

The water sample was also tested for the presence or absence of total coliform and *E. coli*. Total coliform bacteria was found to be present while *E. coli* was absent. Presence of total coliform bacteria within a well that has recently been drilled is not uncommon. With additional proper chlorination of the well, we anticipate that future samples will indicate the absence of total coliform bacteria.

Table 4: Summary of the water quality analysis results

		Cl	Conductivity (mhos/cm)	F	Fe	NO3	Mn	pH	SO4	Hardness (as CaCO3)	TDS	TC/E. coli
Well	**Sample Data**	**TCEQ MCLs & SCLs**										
		300[2]		**4[1] & 2[2]**	**0.3[2]**	**10[1]**	**0.05[2]**	**6.5-8.5[2]**	**300[2]**		**1000[2]**	**Presence**
2	7/27/2021	28	717	0.47	0.015	<0.2	<0.01	8.0	56	88.4	396	Present/Absent

Note: 1 = TCEQ Maximum Contaminant Level; 2 = TCEQ Secondary Contaminant Level; Concentrations in red are above TCEQ SCLs; All units expressed in mg/L (except pH & E.C.);

IV.4. Groundwater Availability

Based upon the analysis of the aquifer test, drawdown estimates were calculated after 10 years and 30 years of continuous production. Figure 9 provides a distance-drawdown plot for a single pumping well producing at a rate of 15 gpm for 0.28 hours per day (251 gallons per day). This pumping volume represents the total water demand at full build out of the subdivision per housing unit (0.28 acre-feet/year for each housing unit).

Assumptions used in the drawdown calculations and overall groundwater availability to the proposed subdivision include inherent uncertainties such as:

- Future pumpage from the aquifer or from interconnected aquifers from area wells outside of the subdivision or any other factor that cannot be predicted that will affect the storage of water in the aquifer;
- Long-term impacts to the aquifer based on climatic variations; and/or,
- Future impacts to usable groundwater due to unforeseen or unpredictable contamination.

Drawdown estimates were calculated using the Theis equation. The Theis Equation has several assumptions used to derive the formula which include (Driscoll, 1986):

1. The water-bearing formation is uniform in character and the hydraulic conductivity is the same in all directions;
2. The aquifer is uniform in thickness and infinite in areal extent;
3. The aquifer receives no recharge from any source;
4. The well penetrates, and receives water from the full thickness of the aquifer;
5. The water from storage is discharged instantaneously when the head is lowered;
6. The pumping well is 100% efficient;
7. All water removed from the well comes from aquifer storage;
8. Laminar flow exists through the well and aquifer; and,
9. The water table or potentiometric surface has no slope.

It is important to note that several of the assumptions used to derive the Theis equation are not necessarily appropriate for the Trinity Aquifer. These include assumptions 3 and 7. The Theis assumptions that (i) the formation receives no recharge from any source and (ii) that all water removed from the well comes from aquifer storage can lead to inaccuracies in estimating drawdown. Driscoll (1986) states, "The assumption that an aquifer receives no recharge during the pumping period is one of the six fundamental conditions upon which the non-equilibrium formulas (Theis) are based. Therefore, all water discharged from a well is assumed to be taken from storage within the aquifer. It is known, however that most formations receive recharge. Hydrographs from long-term observation wells monitored by the US Geological Survey, various state agencies, and similar data-gathering agencies in other parts of the world show that most water-bearing formations receive continual or intermittent recharge."

Furthermore, contrary to the Theis assumptions, Konikow and Leake (2014) note that with increased pumping time, (i) the fraction of pumpage derived from storage tends to decrease, and (ii) the

fraction derived from capture (recharge) increases. Eventually a new equilibrium will be achieved when no more water is derived from storage and heads, or water levels, in the aquifer stabilize. This result is achieved when the initial cone of depression formed by discharge reaches a new source of water, typically the recharge zone of the aquifer. The actual response time for an aquifer system to reach a new equilibrium is a function of the dimensions, hydraulic properties, and boundary conditions for each specific aquifer. For example, the response time will decrease as the hydraulic diffusivity of the aquifer increases (Theis 1940; Barlow and Leake 2012). The response time can range from days to millennia (Bredehoeft and Durbin 2009; Walton 2011). Since the Theis equation assumes (i) that all water is derived from storage and (ii) that the aquifer receives no recharge, the Theis equation may overestimate drawdown within a well that is located in an aquifer that receives recharge rapidly.

Table 5 provides a summary of the results from the distance-drawdown calculation. Estimates of drawdown are based on the following assumptions:

- Total daily water demand (entire subdivision) = 4.8 acre-feet/year
- Total daily water demand (per housing unit) = 0.28 acre-feet/year = 251 gpd;
- The individual well will be pumped at 15 gpm for 0.28 hours per day (Table 5); and
- Transmissivity and storativity values calculated from aquifer testing were used in the drawdown estimates.

The edge of the cone of depression was estimated by taking the distance from the pumped well where the drawdown flattened out or was minimal.

IV.4.1. 15 gpm Production

Based upon the drawdown calculated from the distance-drawdown projection, the drawdown after 10 years of production at 15 gpm and a well spacing of 100 feet results in an average of 0.7 feet. At a spacing of 250 feet, the well interference reduces to an average of 0.2 feet. At a spacing of 500 feet, the well interference reduces further to an average of 0.2 feet.

Based upon the drawdown calculated from the distance-drawdown projection, the drawdown after 30 years of production at 15 gpm and a well spacing of 100 feet results in an average of 0.7 feet. At a spacing of 250 feet, the well interference reduces to an average of 0.2 feet. At a spacing of 500 feet, the well interference reduces further to an average of 0.2 feet.

From the distance drawdown calculations, we recommend that the Mystic Mountain Ranch Subdivision wells be spaced a minimum distance of 100 feet for wells pumped at rates up to 15 gpm. If landowners are able, we recommend spacing wells as far as possible to limit drawdown from well interference. Some well interference may be more pronounced in areas of the subdivision where the aquifer units are more strongly connected; conversely, well interference may not occur in some areas where the aquifer is either disconnected or where there is high permeability.

Table 5: Summary of distance-drawdown calculation (15 gpm)

Well	Drawdown at Pumped Well After 10-Years of Pumping (ft)	Drawdown at Pumped Well After 30-Years of Pumping (ft)	Drawdown at Nearest Property Boundary After 10-Years of Pumping		Drawdown at Nearest Property Boundary After 30-Years of Pumping		Dist. to Outer Edges of Cone of Depression - 10 years (feet)	Dist. to Outer Edges of Cone of Depression - 30 years (feet)
			Property Boundary Distance (ft)	**Drawdown (ft)**	**Property Boundary Distance (ft)**	**Drawdown (ft)**		
Well No. 2	20.27	20.29	145	0.5	145	0.5	100	100

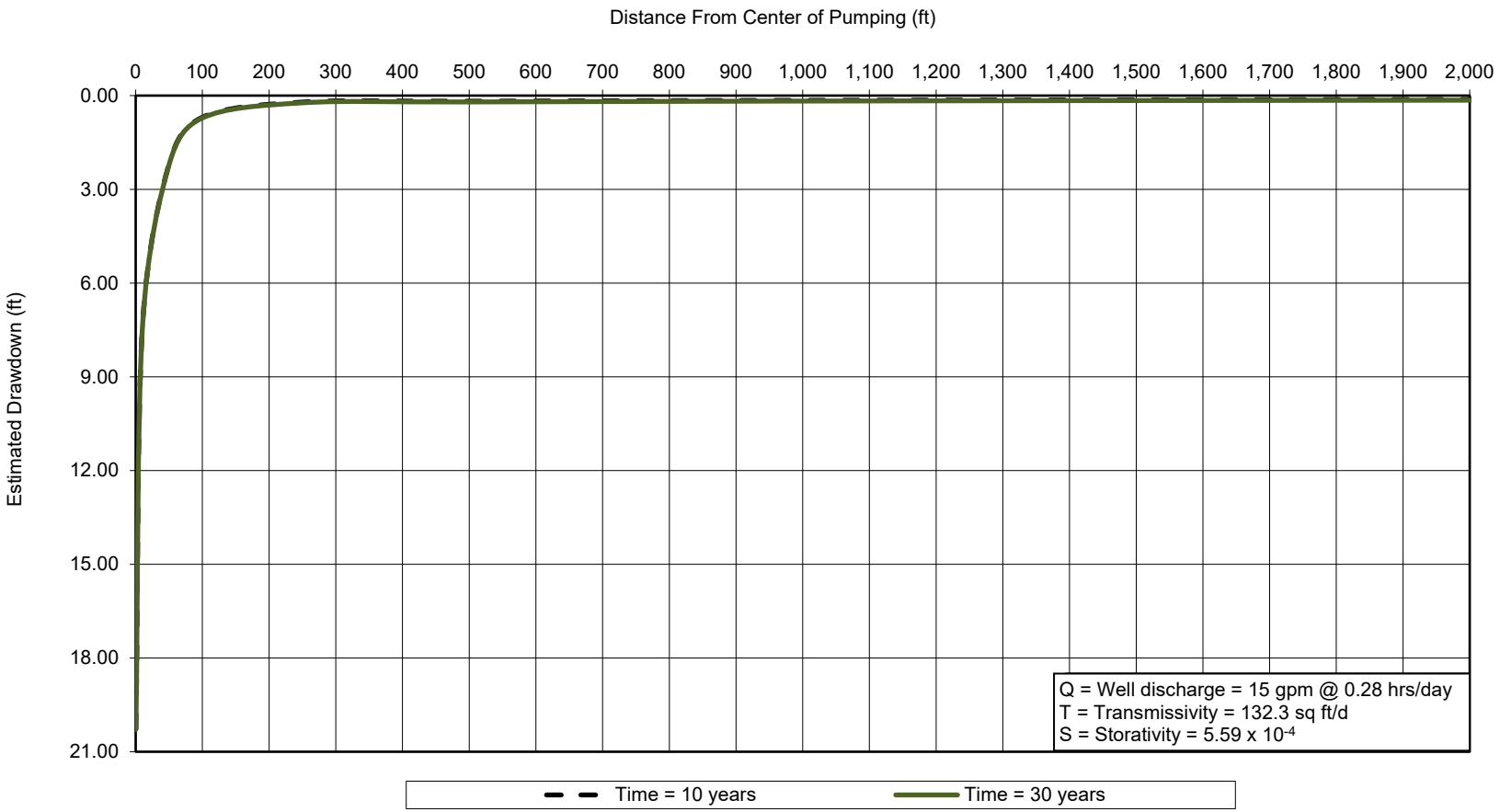


Figure 9: Distance drawdown plot (15 gpm)

IV.5. Groundwater Model

A groundwater model was utilized to determine the projected impacts from production at the proposed subdivision. A one-layer groundwater model, consisting of 370 rows and 370 columns for a total of 136,900 cells, was created to estimate drawdown under a normal production scenario for Mystic Mountain. Each cell has dimensions of 100 feet by 100 feet; the entire grid represents an approximately 49.0 square mile portion of the Trinity Aquifer. The boundaries of the grid extend approximately 3.5 miles beyond the center of the subdivision in order to evaluate the potential regional impact from pumping (Figure 10).

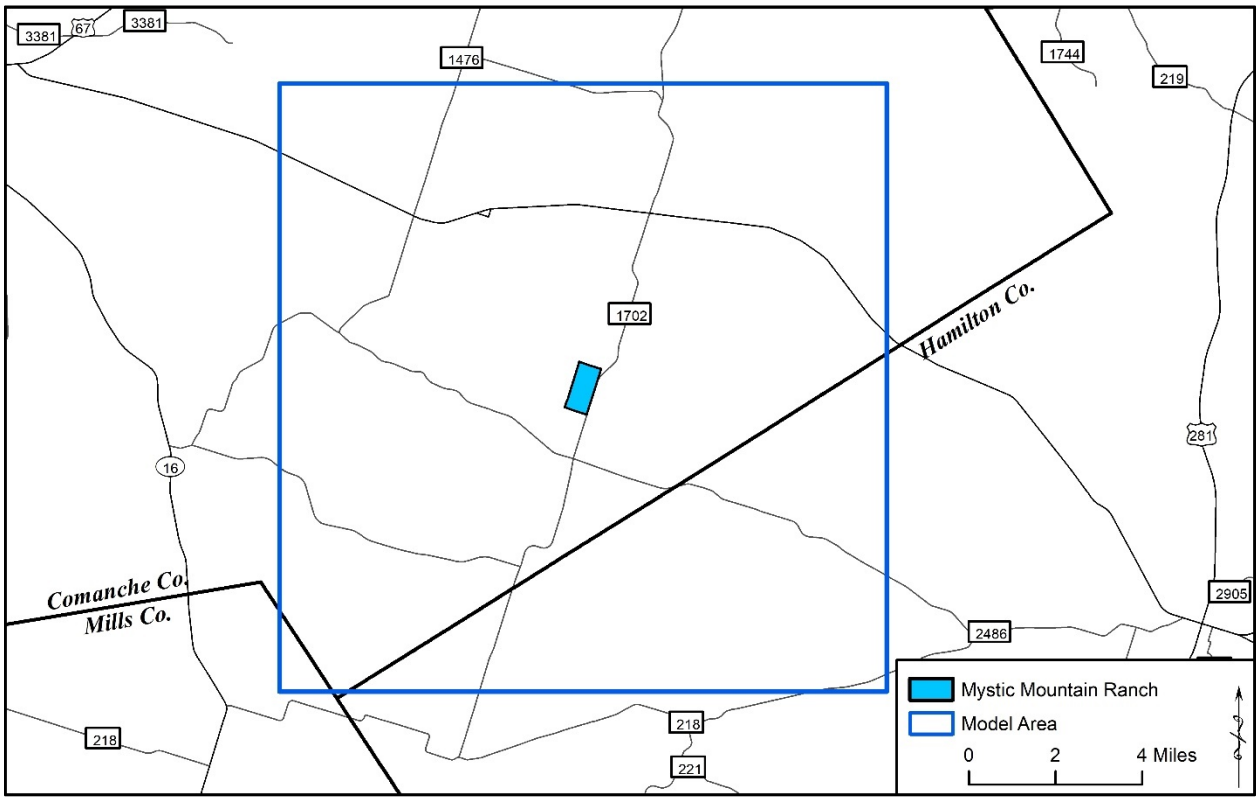


Figure 10: Groundwater model map

The model calculates drawdown at each cell using the Theis Equation,

$$s = \frac{Q}{4\pi T} W(u) \qquad \textit{(Equation 1)}$$

where:

s = drawdown (feet);

Q = discharge (gallons per minute; gpm);

T = transmissivity ($ft.^2$/day); and

W(u) = well function

The well function W(u) is estimated by:

$$W(u) = -0.5772 - \ln u + u - \frac{u^2}{2\times 2!} + \frac{u^3}{3\times 3!} - \frac{u^4}{4\times 4} + \ldots \qquad \textit{(Equation 2)}$$

where:

$$u = \frac{r^2 S}{4Tt} \qquad \textit{(Equation 3)}$$

r = the radius at which drawdown is estimated (feet); and

S = storativity (dimensionless).

The groundwater model was designed to estimate drawdown at full buildout (17 lots) after 10 and 30 years of continuous production at a rate of 251 gallons per day (0.17 gallons per minute (gpm) per well); the total production rate from the Trinity Aquifer equates to approximately 2.89 gpm. The groundwater model was simplified by concentrating pumping to one (1) central locale within the proposed subdivision (Figure 11).

Figure 11: Groundwater model

In an effort to model the aquifer impacts from the proposed pumping, the following values calculated from the aquifer testing were utilized:

- Transmissivity: 132.3 $ft.^2$/day;
- Storativity: 5.59 x 10^{-4}.

The results of the model runs after 10 years and 30 years of continuous pumping are summarized in Figures 12 and 13, with tabulated results in Tables 8 and 9. Static water levels, specific capacities measured during the aquifer tests, and projected water level above each pump are shown in Tables 8 and 9 along with an anticipated pump setting; these values are included to determine the available water column in each well after a given time period, even with active pumping. Each anticipated pump setting represents a depth of 20 feet above the bottom of the respective well.

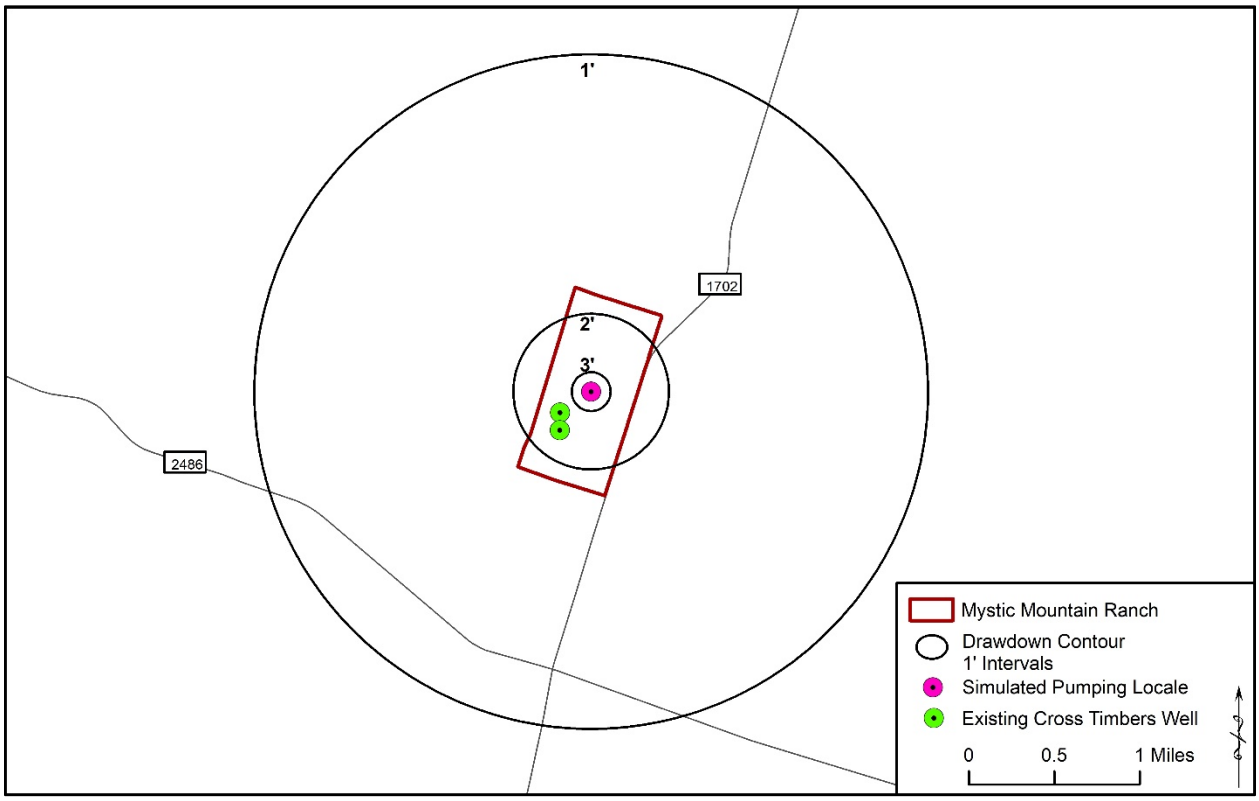


Figure 12: Modeled drawdown after 10 years from production at the proposed Mystic Mountain Ranch

The drawdown calculated after 10 years of production at 251 gallons per day per well results in approximately 2.4 feet of drawdown near the subdivision boundaries (Figure 12). Based upon the results of the aquifer tests coupled with the modeling results, future pumping water levels at the constructed Mystic Mountain Ranch wells will remain near 41.90 feet above the anticipated pump setting (Table 8).

Table 6: Summary of 10-year drawdown calculations

Well	Static Water Level (ft. bgl; present)	Static Water Level (ft. bgl; After 10 years)	Anticipated Pump Setting (ft. bgl)	Specific Capacity from each aquifer test (gpm/ft.)	Pumping Water Level @ 15 gpm (ft. bgl)	Water Level Above Pump (ft.)
No. 2	216.5	224.8	300	0.45	258.10	41.90
Notes: Static water level recorded during each respective aquifer test; ft. = feet; bgl = below ground level; gpm = gallons per minute						

The drawdown calculated after 30 years of production at 251 gallons per day per well results in approximately 2.7 feet of drawdown near the subdivision boundaries (Figure 13). Based upon the results of the aquifer tests coupled with the modeling results, future pumping water levels at the constructed Mystic Mountain Ranch wells will remain near 41.47 feet above the anticipated pump settings (Table 9).

Table 7: Summary of 30-year drawdown calculations

Well	Static Water Level (ft. bgl; present)	Static Water Level (ft. bgl; After 30 years)	Anticipated Pump Setting (ft. bgl)	Specific Capacity from each aquifer test (gpm/ft.)	Pumping Water Level @ 15 gpm (ft. bgl)	Water Level Above Pump (ft.)
No. 2	216.5	225.2	300	0.45	258.53	41.47
Notes: Static water level recorded during each respective aquifer test; ft. = feet; bgl = below ground level; gpm = gallons per minute						

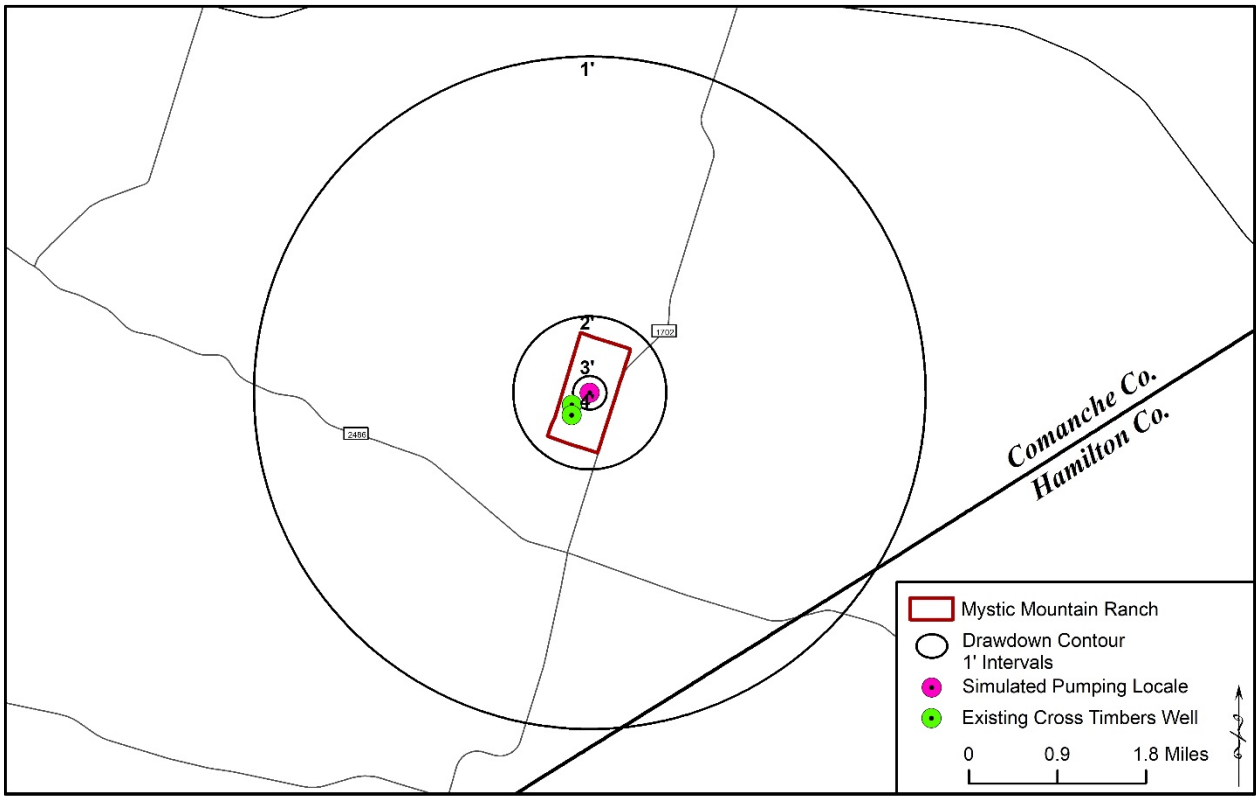


Figure 13: Modeled drawdown after 30 years from production at the proposed Mystic Mountain Ranch

Section V: Certification

I, Kaveh Khorzad, Texas Licensed Professional Geoscientist, certificate number 1126, based on best judgment, current groundwater conditions, and the information developed and presented in this form, certify that adequate groundwater is available from the underlying aquifer to supply the anticipated use of the proposed subdivision.

The Trinity Aquifer in Comanche County exhibits variable yield and water quality and is susceptible to reduction in yield during prolonged drought. For these reasons we recommend that each homeowner construct their well as deep as economically feasible within the Trinity Aquifer to provide the maximum possible yield and to set their pumps as deep as practical to protect from decreasing water levels during drought.

Section VI: References

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Barlow, P.M., and Leake, S.A., 2012. Streamflow depletion by wells—Understanding and managing the effects of groundwater pumping on streamflow. U.S. Geological Survey Circular 1376. Reston, Virginia: USGS.

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Kelly, V.A., Ewing. J., Jones, T.L., Young, S.C., Deeds, N., and Hamlin, S., 2014, Updated Groundwater Availability Model of the Northern Trinity and Woodbine Aquifers: contract report prepared for North Texas GCD, Northern Trinity GCD, Prairielands GCD, and Upper Trinity GCD by INTERA Incorporated, Bureau of Economic Geology, and LBG-Guyton Associates, 990 p.

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Appendix A

Certification of Groundwater Availability for Platting Form

CERTIFICATION OF GROUNDWATER AVAILABILITY FOR PLATTING FORM

Use of this form: If required by a municipal authority pursuant to Texas Local Government Code, §212.0101, or a county authority pursuant to §232.0032, Texas Local Government Code, the plat applicant and the Texas licensed professional engineer or Texas licensed professional geoscientist shall use this form based upon the requirements of Title 30, TAC, Chapter 230 to certify that adequate groundwater is available under the land to be subdivided (if the source of water for the subdivision is groundwater under the subdivision) for any subdivision subject to platting under Texas Local Government Code, §212.004 and §232.001.The form and Chapter 230 do not replace state requirements applicable to public drinking water supply systems or the authority of counties or groundwater conservation districts under either Texas Water Code, §35.019 or Chapter 36.

Administrative Information (30 TAC §230.4)
1. Name of Proposed Subdivision: Mystic Mountain Ranch

Texas Commission on Environmental Quality
Chapter 230 - Groundwater Availability Certification for Platting

2. Any Previous Name Which Identifies the Tract of Land:
3. Property Owner's Name(s): Lone Star Land Partners, LLC
Address: P.O. Box 1987 Marble Falls, Texas 78654
Phone: 800-511-2430
Fax:
4. Plat Applicant's Name: Lone Star Land Partners, LLC
Address: P.O. Box 1987 Marble Falls, Texas 78654
Phone: 800-511-2430
Fax:
5. Licensed Professional Engineer or Geoscientist:
Name: Kaveh Khorzad, P.G.
Address: 317 Ranch Road 620 S., Suite 203, Lakeway, Texas 78734
Phone: 512-773-3226
Fax:
Certificate Number: TBPG License No.: 1126
6. Location and Property Description of Proposed Subdivision: approximately 4.5 miles southeast of the City of Gustine, Texas located along Farm to Market 1702
7. Tax Assessor Parcel Number(s).
Book:
Map:
Parcel: Comanche County: 9559

Proposed Subdivision Information (30 TAC §230.5)
8. Purpose of Proposed Subdivision (single family/multi-family residential, non-residential, commercial): single family
9. Size of Proposed Subdivision (acres): 375.57
10. Number of Proposed Lots: 17
11. Average Size of Proposed Lots (acres): 22.1
12. Anticipated Method of Water Distribution.

Texas Commission on Environmental Quality
Chapter 230 - Groundwater Availability Certification for Platting

Expansion of Existing Public Water Supply System?	Yes	(No)
New (Proposed) Public Water Supply System?	Yes	(No)
Individual Water Wells to Serve Individual Lots?	(Yes)	No
Combination of Methods?	Yes	(No)
Description (if needed):		

13. Additional Information (if required by the municipal or county authority):

Note: If public water supply system is anticipated, written application for service to existing water providers within a 1/2-mile radius should be attached to this form (30 TAC §230.5(f) of this title).

Projected Water Demand Estimate (30 TAC §230.6)
14. Residential Water Demand Estimate at Full Build Out (includes both single family and multi-family residential).
Number of Proposed Housing Units (single and multi-family): 17 single family housing units
Average Number of Persons per Housing Unit: 2.43 persons
Gallons of Water Required per Person per Day: 103 gallons per capita per day (gpcd)
Water Demand per Housing Unit per Year (acre feet/year): 0.28 acre feet
Total Expected Residential Water Demand per Year (acre feet/year): 4.8 acre feet
15. Non-residential Water Demand Estimate at Full Build Out.
Type(s) of Non-residential Water Uses: N/A
Water Demand per Type per Year (acre feet/year): 4.8
16. Total Water Demand Estimate at Full Build Out (acre feet/year): 4.8 acre-ft/year
17. Sources of Information Used for Demand Estimates: US Census data and Central Texas Groundwater Conservation District

General Groundwater Resource Information (30 TAC §230.7)

18. Identify and describe, using Texas Water Development Board names, the aquifer(s) which underlies the proposed subdivision: Trinity Aquifer

Note: Users may refer to the most recent State Water Plan to obtain general information pertaining to the state's aquifers. The State Water Plan is available on the Texas Water Development Board's Internet website at: www.twdb.state.tx.us

Obtaining Site-Specific Groundwater Data (30 TAC §230.8)		
19. Have all known existing, abandoned, and inoperative wells within the proposed subdivision been located, identified, and shown on the plat as required under §230.8(b) of this title?	(Yes)	No
20. Were the geologic and groundwater resource factors identified under §230.7(b) of this title considered in planning and designing the aquifer test required under §230.8(c) of this title?	(Yes)	No
21. Have test and observation wells been located, drilled, logged, completed, developed, and shown on the plat as required by §230.8(c)(1) - (4) of this title?	(Yes)	No
22. Have all reasonable precautions been taken to ensure that contaminants do not reach the subsurface environment and that undesirable groundwater has been confined to the zone(s) of origin (§230.8(c)(5) of this title)?	(Yes)	No
23. Has an aquifer test been conducted which meets the requirements of §230.8(c)(1) and (6) of this title?	(Yes)	No
24. Were existing wells or previous aquifer test data used?	(Yes)	No
25. If yes, did they meet the requirements of §230.8(c)(7) of this title?	(Yes)	No
26. Were additional observation wells or aquifer testing utilized?	Yes	(No)

Note: If expansion of an existing public water supply system or a new public water supply system is the anticipated method of water distribution for the proposed subdivision, site-specific groundwater data shall be developed under the requirements of 30 TAC, Chapter 290, Subchapter D of this title (relating to Rules and Regulations for Public Water Systems) and the applicable information and correspondence developed in meeting those requirements shall be attached to this form pursuant to §230.8(a) of this title.

Texas Commission on Environmental Quality
Chapter 230 - Groundwater Availability Certification for Platting

Determination of Groundwater Quality (30 TAC §230.9)		
27. Have water quality samples been collected as required by §230.9 of this title?	(Yes)	No
28. Has a water quality analysis been performed which meets the requirements of §230.9 of this title?	(Yes)	No

Determination of Groundwater Availability (30 TAC §230.10)		
29. Have the aquifer parameters required by §230.10(c) of this title been determined?	(Yes)	No
30. If so, provide the aquifer parameters as determined.		
Rate of yield and drawdown: (See attached Table 3)		
Specific capacity: (See attached Table 3 & Appendix C)		
Efficiency of the pumped well: (See attached Table 3 & Appendix D)		
Transmissivity: (See attached Table 3 & Appendix C)		
Coefficient of storage: (See attached Table 3)		
Hydraulic conductivity: (See attached Table 3 & Appendix C)		
Were any recharge or barrier boundaries detected?	Yes	(No)
If yes, please describe:		
Thickness of aquifer(s): 104 – 109 ft.		
31. Have time-drawdown determinations been calculated as required under §230.10(d)(1) of this title?	(Yes)	No
32. Have distance-drawdown determinations been calculated as required under §230.10(d)(2) of this title?	(Yes)	No
33. Have well interference determinations been made as required under §230.10(d)(3) of this title?	(Yes)	No
34. Has the anticipated method of water delivery, the annual groundwater demand estimates at full build out, and geologic and groundwater information been taken into account in making these determinations?	(Yes)	No
35. Has the water quality analysis required under §230.9 of this title been compared to primary and secondary public drinking water standards as required under §230.10(e) of	(Yes)	No

this title?		
Does the concentration of any analyzed constituent exceed the standards?	Yes	(No)
If yes, please list the constituent(s) and concentration measure(s) which exceed standards:		

Groundwater Availability and Usability Statements (30 TAC §230.11(a) and (b))
36. Drawdown of the aquifer at the pumped well(s) is estimated to be_____feet over a 10-year period and_____feet over a 30-year period. **(See attached Tables 7 - 9)**
37. Drawdown of the aquifer at the property boundary is estimated to be_____feet over a 10-year period and_____feet over a 30-year period. **(See attached Tables 7 - 9)**
38. The distance from the pumped well(s) to the outer edges of the cone(s)-of-depression is estimated to be_____feet over a 10-year period and_____feet over a 30-year period. **(See attached Tables 7 - 9)**
39. The recommended minimum spacing limit between wells is___100___feet with a recommended well yield of___15___gallons per minute per well.
40. Available groundwater (is) / is not (circle one) of sufficient quality to meet the intended use of the platted subdivision.
41. The groundwater availability determination does not consider the following conditions (identify any assumptions or uncertainties that are inherent in the groundwater availability determination): **(See Section IV.4 & IV.5)**

Certification of Groundwater Availability (30 TAC §230.11(c)) Must be signed by a Texas Licensed Professional Engineer or a Texas Licensed Professional Geoscientist.
42. I,_____Kaveh Khorzad_____, Texas Licensed Professional Engineer or (Texas Licensed Professional Geoscientist) (circle which applies), certificate number_____1126_____, based on best professional judgment, current groundwater conditions, and the information developed and presented in this form, certify that adequate groundwater is available from the underlying aquifer(s) to supply the anticipated use of the proposed subdivision.

Texas Commission on Environmental Quality
Chapter 230 - Groundwater Availability Certification for Platting

Date: 8/6/2021

Adopted July 9, 2008

Effective July 31, 2008

Appendix B

Geophysical Logs

Geophysical Log

Well No. 2

GEO CAM

Borehole: LONE MOUNTAIN No.2

Logs: GAMMA, SPR

Water Well Logging & Video Recording Services

Geo Cam, Inc. 17118 Classen Rd. San Antonio, TX 78247 877-495-9121

Project: LONE MOUNTAIN No.2
Client: TEXAN WW
Location: N 31 47 04.8 W 98 22 05.1

Date: 7/22/2021
County: COMANCHE
State: TX

BOREHOLE DATA

Drilling Contractor: TEXAN WW
Elevation: 1345' GPS
Depth Ref: TC +3.2'

Driller T.D. (ft) : 320'
Logger T.D. (ft) : 313'
Date Drilled: 215'

BIT RECORD				CASING RECORD		
RUN	BIT SIZE (in)	FROM (ft)	TO (ft)	SIZE/WGT/THK	FROM (ft)	TO (ft)
1	7 7/8"	GL	TD	4.5 PVC	+3.2'	313'
2						
3						

Drill Method:
Hole Medium:
Viscosity:

Weight:
Mud Type:
Rm: at: Deg C

Fluid Level (ft) : 215'
Time Since Circ:

GENERAL DATA

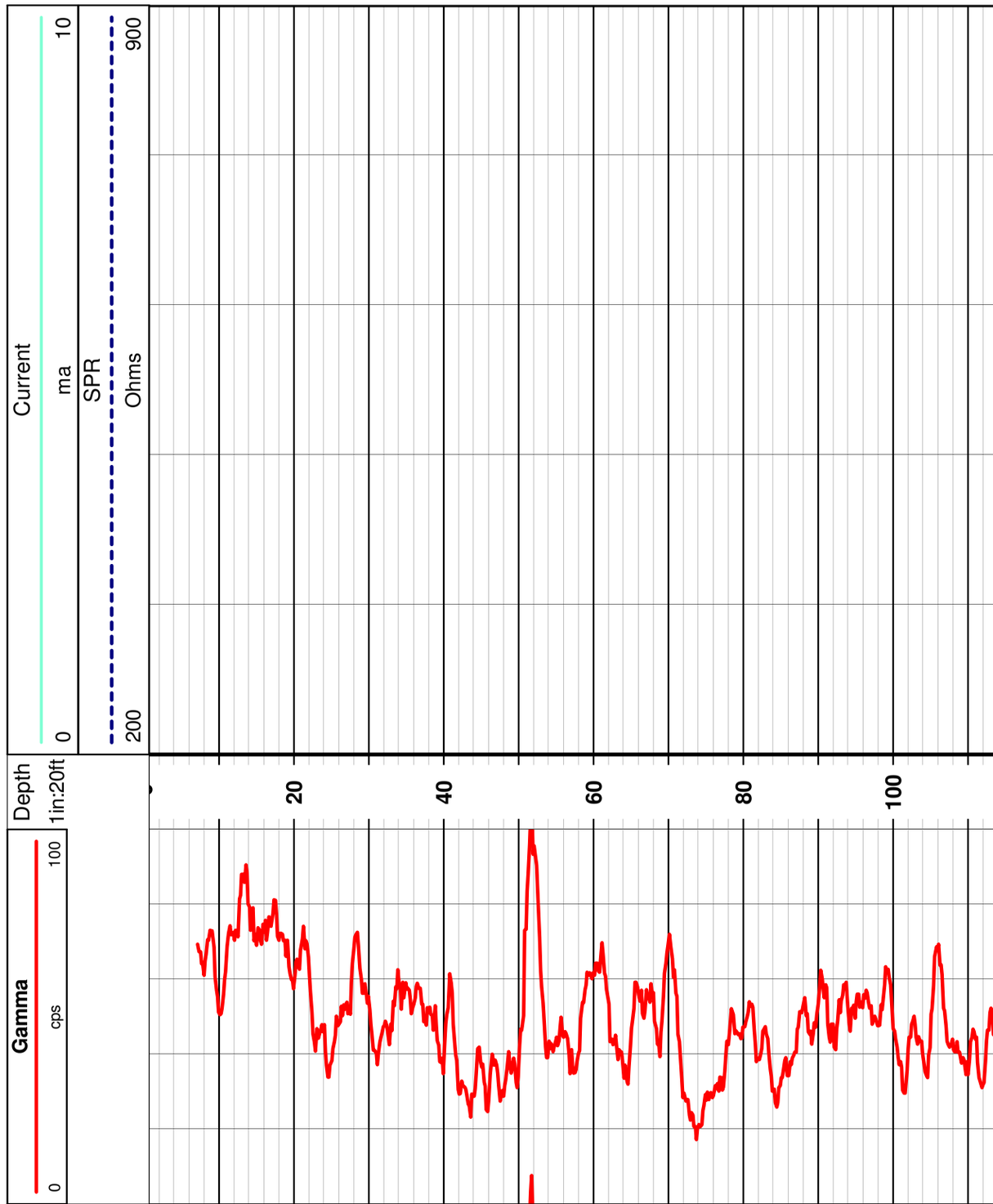
Logged by: Aaron Alvarez
Witness:

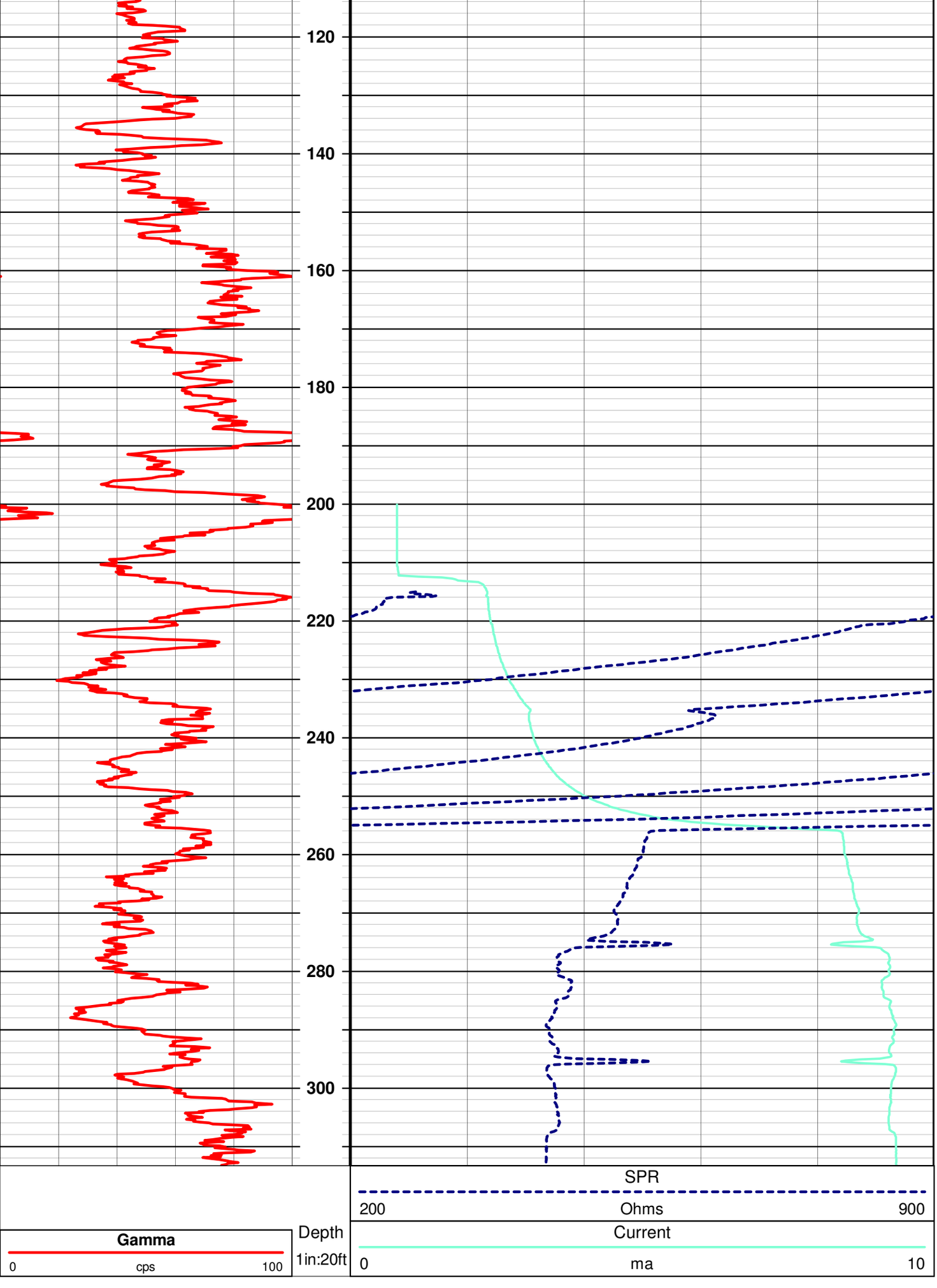
Unit/Truck: 06

LOG TYPE	RUN NO	SPEED (ft/min)	FROM (ft)	TO (ft)	FT./ IN.
GAMMA	1	35	313'	7'	20
SPR	1	35	313'	215'	20

ALL MEASUREMENTS WERE TAKEN AT TC +3.2'

Comments:




120
140
160
180
200
220
240
260
280
300
SPR
200
Ohms
900
Current
0
ma
10
Gamma
0
cps
100
Depth
1in:20ft

Appendix C

State Well Reports

Well Report

Well No. 1

STATE OF TEXAS WELL REPORT for Tracking #577466

Owner:	**Lone Star Land Partners**	Owner Well #:	**No Data**
Address:	**110 CR 250** **Burnet, TX 76811**	Grid #:	**41-14-7**
Well Location:	**1240 CR 266** **Gustine, TX 76455**	Latitude:	**31° 47' 00" N**
		Longitude:	**098° 22' 05" W**
Well County:	**Comanche**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Domestic**

Drilling Start Date: **1/27/2021** Drilling End Date: **1/27/2021**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.875**	**0**	**320**

Drilling Method: **Air Rotary**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**12**	**320**	**Gravel**	**3/8**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**12**	**Cement 4**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Sleeve Installed** **Surface Completion by Driller**

Water Level: **212 ft.** below land surface on **2021-01-27**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **Yield: 10 GPM**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **ALDERSON WATER WELL RESCUE, LLC**

PO BOX 366
STAR, TX 76880

Driller Name: **Caden Connolly** License Number: **60094**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**16**	**OverBurden**
16	**166**	**Gray Sandy Shale**
166	**174**	**Green Sandy Shale**
174	**228**	**Sandy Shale**
228	**238**	**Sandstone**
238	**254**	**Green Shale**
254	**282**	**Brown Lime/Green Sandstone**
282	**312**	**Red/Green Shale**
312	**320**	**Red Shale**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
4.5	**Blank**	**New Plastic (PVC)**	**SDR-17**	**0**	**260**
4.5	**Screen**	**New Plastic (PVC)**	**SDR-17 0.020**	**260**	**320**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner or the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking Number on your written request.

Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

Well Report

Well No. 2

STATE OF TEXAS WELL REPORT for Tracking #579269

Owner:	**Lonestar Land Partners, LLC**	Owner Well #:	**1**
Address:	**110 Co Rd 250** **Burnet, TX 78611**	Grid #:	**41-14-7**
Well Location:	**FM 1702** **Gustine, TX**	Latitude:	**31° 47' 11" N**
	Mystic Mountain #2	Longitude:	**098° 21' 38.9" W**
Well County:	**Comanche**	Elevation:	**No Data**

Type of Work: **New Well** Proposed Use: **Domestic**

Drilling Start Date: **7/20/2021** Drilling End Date: **7/20/2021**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
9	**0**	**20**
6.75	**20**	**320**

Drilling Method: **Air Rotary**

Borehole Completion: **Straight Wall**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**4**	**Cement 2 Bags/Sacks**
4	**20**	**Bentonite 18 Bags/Sacks**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **100+**

Distance to Septic Field or other concentrated contamination (ft.): **NA**

Distance to Septic Tank (ft.): **NA**

Method of Verification: **Owner**

Surface Completion: **Surface Sleeve Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **Rubber at 20 ft.**
Plastic at 21 ft.
Rubber at 250 ft.
Plastic at 251 ft.
Rubber at 255 ft.
Plastic at 256 ft.
Rubber at 260 ft.
Plastic at 261 ft.

Type of Pump: **No Data**

Well Tests: **Estimated** **Yield: 20 GPM**

Water Quality:

Strata Depth (ft.)	Water Type
260 - 320	**Good**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Texan Water**

161 Industrial Loop
Fredericksburg, TX 78624

Driller Name: **Brice Bormann** License Number: **54855**

Apprentice Name: **James Caleb Virdell** Apprentice Number: **59342**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**7**	**Yellow clay and sand**
7	**20**	**Grey and white shale**
20	**50**	**Grey shale with limestone ledges**
50	**90**	**Grey and white chalky limestone**
90	**100**	**Grey shaley limestone**
100	**110**	**Grey sand**
110	**170**	**Grey sandy shale**
170	**185**	**Red and grey shandy shale**
185	**240**	**Grey and tan sand**
240	**300**	**Red and tan sandstone**
300	**320**	**Red tacky clay**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
4.5	**Blank**	**New Plastic (PVC)**		**0**	**280**
4.5	**Screen**	**New Plastic (PVC)**	**0.032**	**280**	**320**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner or the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking Number on your written request.

Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

Appendix D

Aquifer Test Data and Analysis

Aquifer Test

Well No. 2

Mystic Mountain Ranch Well No. 2 - Aquifer Test (July 26, 2021)

Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW Well No. 2 Temperature (F)	PW Well No. 2 Water Level (ft bgs)	PW Well No. 2 Water Level (ft MSL)	PW Well No. 2 Drawdown (ft)	PW Well No. 2 Pump Rate (gpm)	PW Well No. 2 Specific Capacity (gpm/ft)	Comments	OW Well No. 1 Water Level (ft MSL)	OW Well No. 1 Drawdown (ft)
7/26/21 10:12 AM	0		74.74	216.48	1,144.52	0.00			Pump Start	1,157.11	0.00
7/26/21 10:13 AM	1		74.31	232.17	1,128.84	15.68	17	1.08	Meter: 66,373.5 gallons	1,157.03	0.07
7/26/21 10:14 AM	2		73.94	238.68	1,122.32	22.20	23	1.04		1,157.04	0.06
7/26/21 10:15 AM	3		73.65	240.73	1,120.27	24.25	23	0.95		1,157.07	0.04
7/26/21 10:16 AM	4		73.30	242.14	1,118.86	25.66	23	0.90		1,157.00	0.10
7/26/21 10:17 AM	5		73.08	243.40	1,117.60	26.92	23	0.85		1,157.02	0.08
7/26/21 10:18 AM	6		72.89	244.41	1,116.59	27.93	23	0.82		1,157.09	0.02
7/26/21 10:19 AM	7		72.72	244.98	1,116.02	28.50	23	0.81		1,157.09	0.01
7/26/21 10:20 AM	8		72.58	245.87	1,115.13	29.39	23	0.78		1,157.03	0.08
7/26/21 10:21 AM	9		72.45	246.57	1,114.43	30.09	23	0.76		1,157.10	0.00
7/26/21 10:22 AM	10		72.34	247.19	1,113.81	30.71	23	0.75		1,157.01	0.09
7/26/21 10:23 AM	11		72.24	247.61	1,113.39	31.13	23	0.74		1,157.07	0.04
7/26/21 10:24 AM	12		72.15	248.10	1,112.90	31.62	23	0.73		1,157.04	0.06
7/26/21 10:25 AM	13		72.06	248.49	1,112.51	32.01	23	0.72		1,157.04	0.07
7/26/21 10:26 AM	14		71.97	248.81	1,112.19	32.33	23	0.71		1,157.05	0.06
7/26/21 10:27 AM	15		71.91	249.23	1,111.77	32.75	22	0.67		1,157.09	0.02
7/26/21 10:32 AM	20		71.71	250.41	1,110.59	33.93	22	0.65	pH: 7.32/ EC: 0.75	1,157.07	0.04
7/26/21 10:37 AM	25		71.63	251.17	1,109.83	34.69	22	0.63	pH: 7.16/ EC: 0.78	1,157.04	0.06
7/26/21 10:42 AM	30		71.58	251.78	1,109.22	35.30	23	0.65	pH: 7.24/ EC: 0.80	1,157.02	0.09
7/26/21 10:47 AM	35		71.57	252.30	1,108.70	35.82	23	0.64	pH: 7.26/ EC: 0.80	1,156.98	0.13
7/26/21 10:52 AM	40		71.56	252.73	1,108.27	36.25	22	0.61	pH: 7.27/ EC: 0.81	1,157.06	0.05
7/26/21 10:57 AM	45		71.56	253.04	1,107.96	36.56	22	0.60	pH: 7.25/ EC: 0.81	1,156.98	0.12
7/26/21 11:12 AM	60		71.53	253.90	1,107.10	37.42	23	0.61	pH: 7.29/ EC: 0.80	1,156.99	0.12
7/26/21 11:27 AM	75		71.53	254.50	1,106.50	38.02	22	0.58	pH: 7.29/ EC: 0.78	1,156.98	0.13
7/26/21 11:42 AM	90		71.55	255.02	1,105.98	38.54	23	0.60	pH: 7.23/ EC: 0.76	1,156.94	0.16
7/26/21 11:57 AM	105		71.58	255.41	1,105.59	38.93	22	0.57	pH: 7.22/ EC: 0.75	1,156.97	0.14
7/26/21 12:12 PM	120		71.54	255.73	1,105.28	39.24	22	0.56	pH: 7.17/ EC: 0.74	1,156.92	0.18
7/26/21 12:42 PM	150		71.47	252.41	1,108.59	35.93				1,156.92	0.19
7/26/21 1:12 PM	180		71.46	252.53	1,108.47	36.05				1,156.92	0.19
7/26/21 1:42 PM	210		71.47	252.82	1,108.18	36.34				1,156.85	0.26
7/26/21 2:12 PM	240		71.47	250.28	1,110.72	33.80	18	0.53		1,156.81	0.29
7/26/21 3:12 PM	300		71.47	250.12	1,110.88	33.64				1,156.76	0.35
7/26/21 4:12 PM	360		71.48	250.36	1,110.64	33.88	18	0.53		1,156.77	0.34
7/26/21 5:12 PM	420		71.48	250.55	1,110.46	34.06				1,156.76	0.35
7/26/21 6:12 PM	480		71.48	250.79	1,110.21	34.31				1,156.81	0.30

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4 inches Horsepower = 1 1/2 HP
MSL = Mean Sea Level Pump Setting = 300 ft EC=Electrical conductivity (mS/cm)

Mystic Mountain Ranch Well No. 2 - Aquifer Test (July 26, 2021)

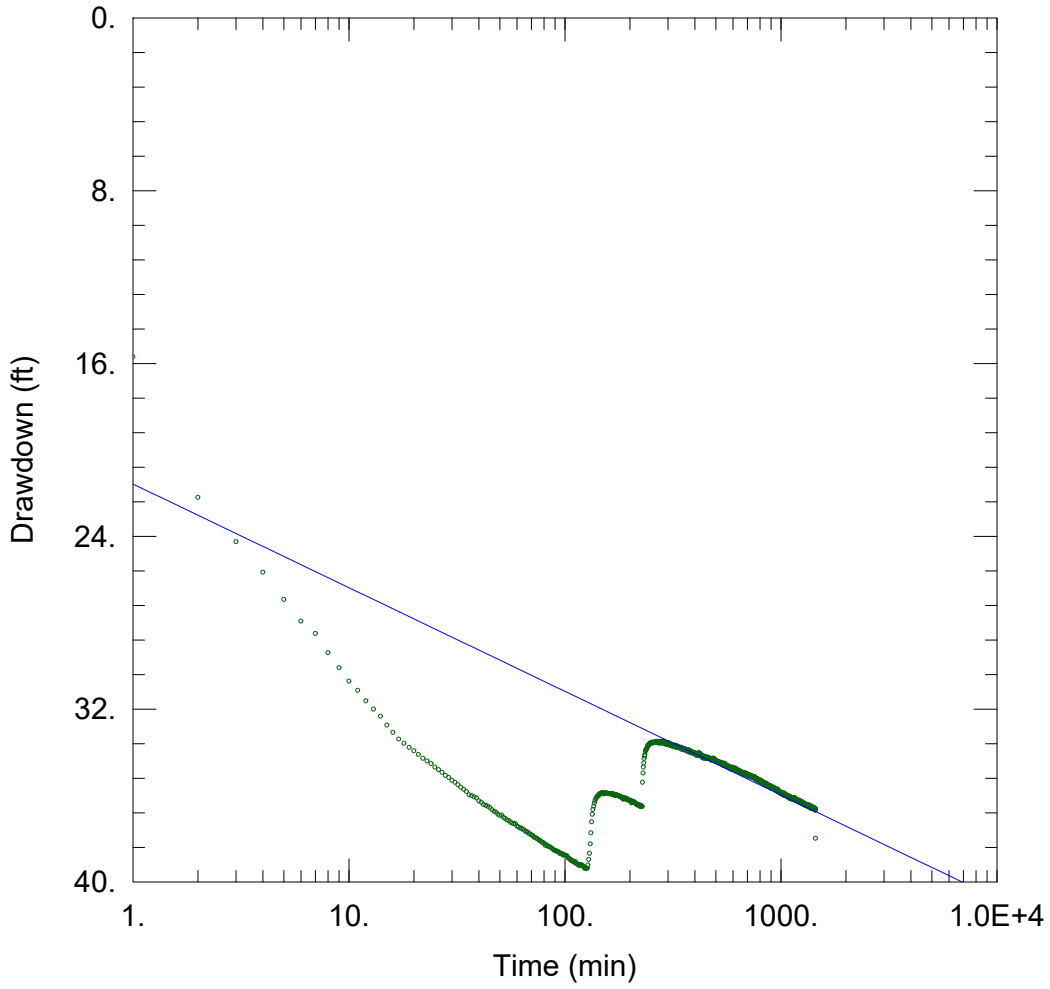
Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW Well No. 2 Temperature (F)	PW Well No. 2 Water Level (ft bgs)	PW Well No. 2 Water Level (ft MSL)	PW Well No. 2 Drawdown (ft)	PW Well No. 2 Pump Rate (gpm)	PW Well No. 2 Specific Capacity (gpm/ft)	Comments	OW Well No. 1 Water Level (ft MSL)	OW Well No. 1 Drawdown (ft)
7/26/21 7:12 PM	540		71.48	251.00	1,110.00	34.52				1,156.79	0.32
7/26/21 8:12 PM	600		71.48	251.21	1,109.79	34.73				1,156.69	0.42
7/26/21 9:12 PM	660		71.48	251.39	1,109.61	34.91				1,156.71	0.40
7/26/21 10:12 PM	720		71.48	251.57	1,109.43	35.09				1,156.75	0.36
7/26/21 11:12 PM	780		71.48	251.76	1,109.25	35.27				1,156.71	0.40
7/27/21 12:12 AM	840		71.48	251.91	1,109.09	35.43				1,156.68	0.43
7/27/21 1:12 AM	900		71.48	252.11	1,108.89	35.63				1,156.65	0.46
7/27/21 2:12 AM	960		71.49	252.23	1,108.77	35.75				1,156.66	0.45
7/27/21 3:12 AM	1,020		71.48	252.41	1,108.59	35.93				1,156.73	0.38
7/27/21 4:12 AM	1,080		71.48	252.53	1,108.47	36.05				1,156.69	0.42
7/27/21 5:12 AM	1,140		71.49	252.62	1,108.38	36.14				1,156.62	0.49
7/27/21 6:12 AM	1,200		71.49	252.72	1,108.28	36.24				1,156.68	0.42
7/27/21 7:12 AM	1,260		71.49	252.80	1,108.20	36.32				1,156.68	0.42
7/27/21 8:12 AM	1,320		71.48	252.93	1,108.07	36.45				1,156.60	0.51
7/27/21 9:12 AM	1,380		71.49	253.05	1,107.95	36.57				1,156.59	0.51
7/27/21 10:12 AM	1,440		71.49	253.10	1,107.90	36.62				1,156.62	0.48
7/27/21 10:19 AM	1,447	0	71.49	254.46	1,106.54	37.98	17	0.45	Pump Stop	1,156.64	0.47
7/27/21 10:20 AM	1,448	1	71.49	247.33	1,113.67	30.85			Meter: 92,355.5 gallons	1,156.60	0.50
7/27/21 10:21 AM	1,449	2	71.50	243.29	1,117.72	26.80			Avg. Pump Rate: 18	1,156.61	0.49
7/27/21 10:22 AM	1,450	3	71.50	240.04	1,120.96	23.56				1,156.62	0.48
7/27/21 10:23 AM	1,451	4	71.54	237.53	1,123.47	21.05				1,156.64	0.47
7/27/21 10:24 AM	1,452	5	71.62	234.76	1,126.24	18.28				1,156.58	0.53
7/27/21 10:25 AM	1,453	6	71.72	232.57	1,128.43	16.09				1,156.66	0.44
7/27/21 10:26 AM	1,454	7	71.84	231.20	1,129.80	14.72				1,156.65	0.45
7/27/21 10:27 AM	1,455	8	71.97	230.29	1,130.71	13.81				1,156.57	0.54
7/27/21 10:28 AM	1,456	9	72.11	229.67	1,131.33	13.19				1,156.60	0.51
7/27/21 10:29 AM	1,457	10	72.25	229.21	1,131.79	12.73				1,156.49	0.61
7/27/21 10:30 AM	1,458	11	72.37	228.80	1,132.20	12.32				1,156.60	0.51
7/27/21 10:31 AM	1,459	12	72.47	228.51	1,132.49	12.03				1,156.63	0.47
7/27/21 10:32 AM	1,460	13	72.56	228.27	1,132.73	11.79				1,156.64	0.47
7/27/21 10:33 AM	1,461	14	72.64	228.02	1,132.98	11.54				1,156.59	0.51
7/27/21 10:34 AM	1,462	15	72.71	227.80	1,133.20	11.32				1,156.57	0.54
7/27/21 10:39 AM	1,467	20	72.82	226.99	1,134.01	10.51				1,156.57	0.54
7/27/21 10:44 AM	1,472	25	72.79	226.41	1,134.59	9.93				1,156.60	0.51
7/27/21 10:49 AM	1,477	30	72.70	225.95	1,135.05	9.47				1,156.65	0.46

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4 inches Horsepower = 1 1/2 HP
MSL = Mean Sea Level Pump Setting = 300 ft EC=Electrical conductivity (mS/cm)

Mystic Mountain Ranch Well No. 2 - Aquifer Test (July 26, 2021)

Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW Well No. 2 Temperature (F)	PW Well No. 2 Water Level (ft bgs)	PW Well No. 2 Water Level (ft MSL)	PW Well No. 2 Drawdown (ft)	PW Well No. 2 Pump Rate (gpm)	PW Well No. 2 Specific Capacity (gpm/ft)	Comments	OW Well No. 1 Water Level (ft MSL)	OW Well No. 1 Drawdown (ft)
7/27/21 10:54 AM	1,482	35	72.59	225.59	1,135.41	9.11				1,156.62	0.49
7/27/21 10:59 AM	1,487	40	72.47	225.28	1,135.72	8.80				1,156.54	0.57
7/27/21 11:04 AM	1,492	45	72.36	225.05	1,135.95	8.57				1,156.60	0.50
7/27/21 11:19 AM	1,507	60	72.15	224.38	1,136.62	7.90				1,156.65	0.45
7/27/21 11:34 AM	1,522	75	72.07	223.89	1,137.11	7.41				1,156.67	0.44
7/27/21 11:49 AM	1,537	90	71.98	223.52	1,137.48	7.04				1,156.60	0.51
7/27/21 12:04 PM	1,552	105	71.91	223.20	1,137.80	6.72				1,156.66	0.44
7/27/21 12:19 PM	1,567	120	71.89	222.95	1,138.05	6.47				1,156.70	0.41
7/27/21 12:49 PM	1,597	150	71.84	222.51	1,138.49	6.03				1,156.69	0.42
7/27/21 1:19 PM	1,627	180	71.82	222.25	1,138.75	5.77				1,156.67	0.44
7/27/21 1:49 PM	1,657	210	71.78	221.90	1,139.10	5.42				1,156.71	0.40
7/27/21 2:19 PM	1,687	240	71.76	221.63	1,139.37	5.15				1,156.72	0.38
7/27/21 3:19 PM	1,747	300	71.70	221.23	1,139.77	4.75				1,156.71	0.39
7/27/21 4:19 PM	1,807	360	71.70	220.89	1,140.11	4.41				1,156.65	0.46
7/27/21 5:19 PM	1,867	420	71.68	220.65	1,140.35	4.16				1,156.71	0.40
7/27/21 6:19 PM	1,927	480	71.67	220.42	1,140.58	3.94				1,156.75	0.35
7/27/21 7:19 PM	1,987	540	71.66	220.22	1,140.78	3.74				1,156.77	0.34
7/27/21 8:19 PM	2,047	600	71.65	219.94	1,141.06	3.46				1,156.83	0.28
7/27/21 9:19 PM	2,107	660	71.64	219.84	1,141.16	3.36				1,156.81	0.30
7/27/21 10:19 PM	2,167	720	71.64	219.69	1,141.31	3.21				1,156.83	0.27
7/27/21 11:19 PM	2,227	780	71.62	219.54	1,141.46	3.06				1,156.75	0.36
7/28/21 12:19 AM	2,287	840	71.62	219.48	1,141.52	3.00				1,156.88	0.22
7/28/21 1:19 AM	2,347	900	71.62	219.37	1,141.63	2.89				1,156.83	0.28
7/28/21 2:19 AM	2,407	960	71.62	219.27	1,141.73	2.79				1,156.85	0.25
7/28/21 3:19 AM	2,467	1,020	71.61	219.22	1,141.79	2.73				1,156.79	0.32
7/28/21 4:19 AM	2,527	1,080	71.61	219.10	1,141.90	2.62				1,156.80	0.31
7/28/21 5:19 AM	2,587	1,140	71.60	219.05	1,141.96	2.56				1,156.85	0.25
7/28/21 6:19 AM	2,647	1,200	71.60	218.98	1,142.02	2.50				1,156.85	0.26
7/28/21 7:19 AM	2,707	1,260	71.61	218.89	1,142.11	2.41				1,156.85	0.26
7/28/21 8:19 AM	2,767	1,320	71.61	218.79	1,142.21	2.31				1,156.83	0.28
7/28/21 9:19 AM	2,827	1,380	71.61	218.73	1,142.27	2.25				1,156.84	0.27
7/28/21 10:19 AM	2,887	1,440	71.62	218.66	1,142.34	2.18				1,156.83	0.28

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4 inches Horsepower = 1 1/2 HP
MSL = Mean Sea Level Pump Setting = 300 ft EC=Electrical conductivity (mS/cm)



WELL TEST ANALYSIS

Data Set: \...\PW Well 2.aqt
Date: 08/05/21 Time: 15:31:57

PROJECT INFORMATION

Company: WRGS
Client: Lone Star Land Partners
Project: 083-002-21
Location: Comanche County
Test Well: Well No. 2
Test Date: 7-14-21

AQUIFER DATA

Saturated Thickness: 104. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well No. 2	0	0

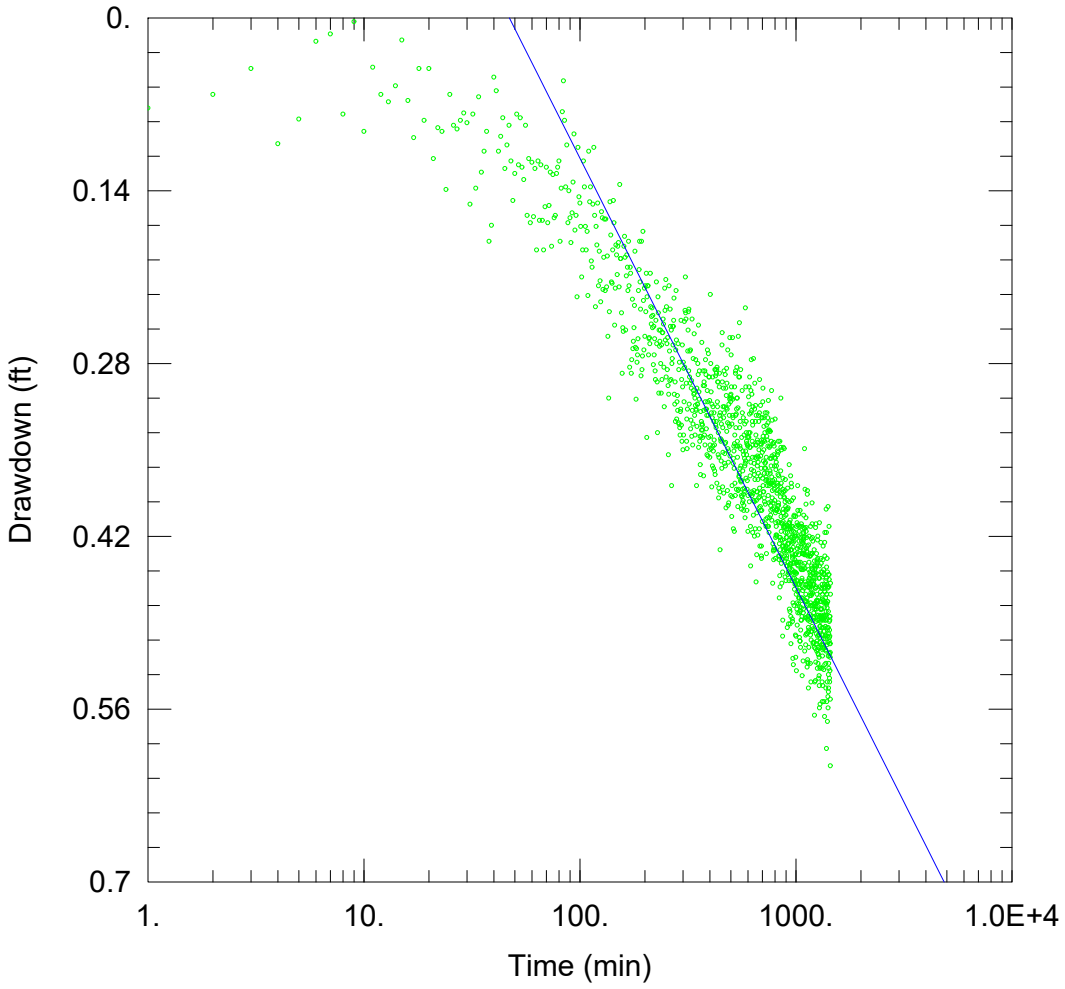
Observation Wells

Well Name	X (ft)	Y (ft)
◦ Well No. 1	490	0

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob

T = 132.3 ft^2/day K = 1.27 ft/day



WELL TEST ANALYSIS

Data Set: \...\OW Well 1.aqt
Date: 08/05/21 Time: 15:33:24

PROJECT INFORMATION

Company: WRGS
Client: Lone Star Land Partners
Project: 083-002-21
Location: Comanche County
Test Well: Well No. 2
Test Date: 7-14-21

AQUIFER DATA

Saturated Thickness: 104. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well No. 2	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
Well No. 1	490	0

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob

T = 1825.6 ft^2/day S = 0.0005589

Appendix E

Well Efficiency Calculation

Well Efficiency

Well No. 2

Wet Rock Groundwater Services, L.L.C.
Groundwater Specialists
TBPG Firm No: 50038
317 Ranch Road 620 South, Suite 203
Austin, Texas 78734 • Ph: 512-773-3226
www.wetrockgs.com

Well Efficiency Calculations
Well No. 2

From: *Driscoll, F.G., 1986: Groundwater and Wells: second Ed. Pp.575-579*

Well Efficiency = (Actual specific capacity / Theoretical specific capacity)

Actual Specific Capacity = Q/s

Where: Q = Discharge of well, in gpm; and
s = drawdown, in feet

Actual Specific Capacity = 17 gpm / 37.98 ft = 0.45 gpm/ft

Theoretical Specific Capacity = $\frac{Q}{s} = \frac{T}{264\log\frac{0.3Tt}{r^2S}} = \frac{T}{2000}$

Where: T = Transmissivity, in gpd/ft
t = Time of pumping, in days
S = Storage Coefficient, = 5.59 x 10^{-4}
r = radius of well, in ft.

Theoretical Specific Capacity = $\frac{989.73}{264\log\frac{0.3(989.73)(1)}{0.1875^2(5.59 \times 10^{-4})}}$ **= 0.52**

Efficiency = Actual Specific Capacity / Theoretical Specific Capacity = 0.45 / 0.52 = **87%**

Appendix F

Water Quality Report

Water Quality

Well No. 2

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Brice Bormann **Texan Water** **161 Industrial Loop** **Fredericksburg, TX 78624**	**Project Name: Mystic Mountain** **Sample ID: Mystic Mountain #2** **Matrix: Drinking Water** **Date/Time Taken: 7/27/2021 1001**	**PCS Sample #: 644137 Page 1 of 3** **Date/Time Received: 7/29/2021 09:20** **Report Date: 8/3/2021** Approved by: Chuck Wallgren, President

Test Description	Flag	Result	Units	RL	Analysis Date/Time	Method	Analyst
pH	!, I	8.0	S.U.	N/A	7/30/2021 18:00	SM 4500-H+ B	CRM
Chloride		28	mg/L	2	7/29/2021 16:50	EPA 300.0	JAS
Conductivity, Specific		717	µmhos/cm at 25° C	1	7/29/2021 12:55	SM 2510B	CML
Nitrate-N	H	<0.2	mg/L	0.2	7/29/2021 16:50	EPA 300.0	JAS
Nitrite-N	H	<0.2	mg/L	0.2	7/29/2021 16:50	EPA 300.0	JAS
Sulfate		56	mg/L	2	7/29/2021 16:50	EPA 300.0	JAS
Total Dissolved Solids		396	mg/L	10	7/30/2021 13:25	SM 2540C	CML
Fluoride		0.47	mg/L	0.20	7/29/2021 16:50	EPA 300.0	JAS

Quality Assurance Summary

Test Description	Precision	Limit	LCL	MS	MSD	UCL	LCS	LCS Limit
pH	N/A	N/A	N/A			N/A		
Chloride	<1	10	95	97	97	103	93	85 - 115
Conductivity, Specific	N/A	N/A	N/A			N/A		
Nitrate-N	<1	20	70	96	96	130	93	85 - 115
Nitrite-N	<1	10	93	*90	*91	113	92	85 - 115
Sulfate	<1	10	94	94	*93	102	102	85 - 115
Total Dissolved Solids	6	10	N/A	N/A	N/A	N/A		
Fluoride	<1	10	93	100	100	109	104	85 - 115

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

*Approved for release per QA Plan, Exception to Limits - QAM Section 13-4
! *Not NELAP Certifiable Parameter*
H *Sample analysis started outside hold time, see Sample Log-In Checklist Comment*
I *Informational purposes only - pH outside hold time*

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

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

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Brice Bormann **Texan Water** **161 Industrial Loop** **Fredericksburg, TX 78624**	**Project Name: Mystic Mountain** **Sample ID: Mystic Mountain #2** **Matrix: Drinking Water** **Date/Time Taken: 7/27/2021 1001**	**PCS Sample #: 644137 Page 2 of 3** **Date/Time Received: 7/29/2021 09:20** **Report Date: 8/3/2021**

Test Description	Flag	Result	Units	RL	Analysis Date/Time	Method	Analyst
Alkalinity, Total	!	288	mg/L	10	7/30/2021 17:30	SM 2320 B	CRM
Arsenic/ICP MS		0.0006	mg/L	0.0005	7/30/2021 10:50	EPA 200.8	DJL
Copper/ICP (Total)		<0.005	mg/L	0.005	7/30/2021 12:46	EPA 200.7 / 6010 B	DJL
Calcium Hardness as CaCO3		88.4	mg/L	N/A	7/30/2021 12:03	SM 2340B (Calc)	DJL
Calcium/ICP (Total)		35.4	mg/L	0.50	7/30/2021 12:03	EPA 200.7 / 6010 B	DJL
Lead/ICP MS		<0.0005	mg/L	0.0005	7/30/2021 10:50	EPA 200.8	DJL
Aluminum/ICP (Total)		0.011	mg/L	0.010	7/30/2021 12:46	EPA 200.7 / 6010 B	DJL
Iron/ICP (Total)		0.015	mg/L	0.010	7/30/2021 12:46	EPA 200.7 / 6010 B	DJL

Quality Assurance Summary

Test Description	Precision	Limit	LCL	MS	MSD	UCL	LCS	LCS Limit
Alkalinity, Total	<1	10	95	99	99	107	100	85 - 115
Arsenic/ICP MS	2	20	70	105	106	130	103	85 - 115
Copper/ICP (Total)	1	20	75	97	96	125	100	85 - 115
Calcium Hardness as CaCO3	N/A	N/A	N/A			N/A		
Calcium/ICP (Total)	<1	20	75	*N/C	*N/C	125	98	85 - 115
Lead/ICP MS	1	20	70	110	111	130	108	85 - 115
Aluminum/ICP (Total)	<1	20	75	99	99	125	100	85 - 115
Iron/ICP (Total)	<1	20	75	94	94	125	100	85 - 115

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

*Approved for release per QA Plan, Exception to Limits - QAM Section 13-4

! *Not NELAP Certifiable Parameter*

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

**N/C = Not Calculated, Sample Concentration Greater than 5 times the Spike Level*

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

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Brice Bormann **Texan Water** **161 Industrial Loop** **Fredericksburg, TX 78624**	**Project Name: Mystic Mountain** **Sample ID: Mystic Mountain #2** **Matrix: Drinking Water** **Date/Time Taken: 7/27/2021 1001**	**PCS Sample #: 644137 Page 3 of 3** **Date/Time Received: 7/29/2021 09:20** **Report Date: 8/3/2021**

Test Description	Result	Units	RL	Analysis Date/Time	Method	Analyst
Sodium/ICP (Total)	72.2	mg/L	0.50	7/30/2021 12:03	EPA 200.7 / 6010 B	DJL
Manganese/ICP (Total)	<0.010	mg/L	0.010	7/30/2021 12:46	EPA 200.7 / 6010 B	DJL
Zinc/ICP (Total)	0.014	mg/L	0.010	7/30/2021 12:46	EPA 200.7 / 6010 B	DJL

Quality Assurance Summary

Test Description	Precision	Limit	LCL	MS	MSD	UCL	LCS	LCS Limit
Sodium/ICP (Total)	<1	20	75	*N/C	*N/C	125	91	85 - 115
Manganese/ICP (Total)	1	20	75	94	93	125	100	85 - 115
Zinc/ICP (Total)	<1	20	75	94	94	125	100	85 - 115

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

*Approved for release per QA Plan, Exception to Limits - QAM Section 13-4

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POLLUTION CONTROL SERVICES

Chain of Custody Number 644137

MULTIPLE SAMPLE ANALYSIS REQUEST AND CHAIN OF CUSTODY FORM

Stamp 1st sample and COC as same number

CUSTOMER INFORMATION

Name: Texon Water

REPORT INFORMATION

Attention: Chris Knox | Phone: 512-943-5646 | Fax:

SAMPLE INFORMATION

Project Information: Mystic Mountain

Report "Soils" ☑ As Is ☐ Dry Wt.

Collected By: Joe D.

Requested Analysis: TLEG Well

Instructions/Comments:

Client / Field Sample ID	Collected Date	Collected Time	Field Chlorine Residual mg/L	Composite or Grab	Matrix (DW-Drinking Water; NPW-Non-potable water; WW-Wastewater; LW-Liquid Waste)	Container Type	Container Number	Preservative	TLEG Well	PCS Sample Number
Mystic Mountain #2	Start: 7/27/21 End: 7/27/21	Start: 10:00Am End: 10:21Am		☐C ☑G	☑ DW ☐ NPW ☐ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☐G ☐O		☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☐ ICE ☐ ____	X	644137 ☐S ☐B ☒N ☐HEM Other:
	Start: End:	Start: End:		☐C ☐G	☐ DW ☐ NPW ☐ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☐G ☐O		☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☐ ICE ☐ ____		☐S ☐B ☐N ☐HEM Other:
	Start: End:	Start: End:		☐C ☐G	☐ DW ☐ NPW ☐ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☐G ☐O		☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☐ ICE ☐ ____		☐S ☐B ☐N ☐HEM Other:
	Start: End:	Start: End:		☐C ☐G	☐ DW ☐ NPW ☐ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☐G ☐O		☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☐ ICE ☐ ____		☐S ☐B ☐N ☐HEM Other:
	Start: End:	Start: End:		☐C ☐G	☐ DW ☐ NPW ☐ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☐G ☐O		☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☐ ICE ☐ ____		☐S ☐B ☐N ☐HEM Other:
	Start: End:	Start: End:		☐C ☐G	☐ DW ☐ NPW ☐ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☐G ☐O		☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☐ ICE ☐ ____		☐S ☐B ☐N ☐HEM Other:
	Start: End:	Start: End:		☐C ☐G	☐ DW ☐ NPW ☐ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☐G ☐O		☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☐ ICE ☐ ____		☐S ☐B ☐N ☐HEM Other:
	Start: End:	Start: End:		☐C ☐G	☐ DW ☐ NPW ☐ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☐G ☐O		☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☐ ICE ☐ ____		☐S ☐B ☐N ☐HEM Other:

Required Turnaround: ☐ Routine (6-10 days) | *EXPEDITE*: (See Surcharge Schedule) ☐ < 8 Hrs. ☐ < 16 Hrs. ☐ < 24 Hrs. ☑ 5 days ☐ Other: ____ *Rush Charges Authorized by:*

Sample Archive/Disposal: ☑ Laboratory Standard ☐ Hold for client pick up | **Container Type:** P = Plastic, G = Glass, O = Other ____ Carrier ID: ____

Relinquished By:	[signature]	Date:	7/29/21	Time:	9:20am	Received By:	[signature]	Date:	7/29/21	Time: 0920
Relinquished By:		Date:		Time:		Received By:		Date:		Time:

Rev. Multiple Sample COC_20180628

1532 Universal City Blvd., Ste. 100, Universal City, Texas 78148
P (210) 340-0343 or (800) 880-4616 - F (210) 658-7903

Login at www.pcslab.net

Pollution Control Services
Sample Log-In Checklist

PCS Sample No(s) 644137 **COC No.** 644137

Client/Company Name: Texan H_2O **Checklist Completed by:** GUF

Sample Delivery to Lab Via:
Client Drop Off ✓ Commercial Carrier: Bus ____ UPS ____ Lone Star ____ FedEx ____ USPS ____
PCS Field Services: Collection/Pick Up____ Other:____

Sample Kit/Coolers
Sample Kit/Cooler? Yes ✓ No____ Sample Kit/Cooler: Intact? Yes ✓ No___
Custody Seals on Sample Kit/Cooler: Not Present ✓ If Present, Intact ___ Broken ___
Sample Containers Intact; Unbroken and Not Leaking? Yes ✓ No ___
Custody Seals on Sample Bottles: Not Present ✓ If Present, Intact ___ Broken ___
COC Present with Shipment or Delivery or Completed at Drop Off? Yes ✓ No ___
Has COC sample date/time and other pertinent information been provided by client/sampler? Yes: ✓ No: ____
Has COC been properly Signed when Received/Relinquished? Yes ✓ No ___
Does COC agree with Sample Bottle Information, Bottle Types, Preservation, etc.? Yes ✓ No ___
All Samples Received before Hold Time Expiration? Yes ✓ No ___
Sufficient Sample Volumes for Analysis Requested? Yes ✓ No ___
Zero Headspace in VOA Vial if Present? Yes ___ No ___

Sample Preservation:
* ***Cooling:*** **Not Required** _____ or **Required** ✓
If cooling required, record temperature of submitted samples Observed/Corrected 3 / 1 °C
Is Ice Present in Sample Kit/Cooler? ✓ Yes ____ No Samples received same day as collected? ____ Yes ✓ No
Lab Thermometer Make and Serial Number: Vaughan 1807009583 Other: ____

Acid Preserved Sample - If present, is pH <2? **Yes ____ No ____** ** ____H_2SO_4 ____HNO_3 ____H_3PO_4
Base Preserved Sample - If present, is pH >12? Yes ____ No ____ ____NaOH
Other Preservation:____ If Present, Meets Requirements? Yes____ No____
Sample Preservations Checked by:____ Date ____ Time ____
pH paper used to check sample preservation (PCS log #): ____ (HEM pH checked at analysis).

Samples Preserved/Adjusted by Lab: Lab #	Parameters Preserved	Preservative Used	Log #
	metals	HNO_3	01601P01

Adjusted by Tech/Analyst: GUF Date: 7/29/21 Time: 0925

Client Notification/ Documentation for "No" Responses Above/ Discrepancies/ Revision Comments
Person Notified: Chris Contacted by: GUF
Notified Date: 7/29/21 Time: 0928
Method of Contact: At Drop Off:____ Phone ✓ Left Voice Mail ____ E-Mail ____ Fax ____
Unable to Contact____ Authorized Laboratory to Proceed :____(Lab Director)
Regarding / Comments: Called Chris about NO_2 NO_3 and 2the short HT
7/29/21 GUF

Actions taken to correct problems/discrepancies:____

Receiving qualifier needed (*requires client notification above*) Temp. ____ Holding Time ✓ Initails: GUF
Receiving qualifier entered into LIMS at login Initial/Date: LMW 7.29.2021
Revision Comments: ____

** Samples submitted for Metals Analysis (except Hex Cr) or Drinking Water for Coliform Bacteria Only are not required to be iced. Samples collected prior day to receipt at the laboratory must meet method specific thermal cooling requirements, "or will be flagged accordingly". Samples delivered the same day as collected may not meet thermal criteria, but shall be considered acceptable if evidence that the chilling process has begun, such as arrival on ice (EPA 815-F-08-006, June 2008). ** Water samples for metals analysis that are not acid preserved prior to shipment may be acceptably preserved by the laboratory on receipt – however. the sample digestion procedure must be delayed for at least 24 hours after preservation by the laboratory.*

TCEQ Microbial Reporting Form

TCEQ Form 10525
08/2017

Water System Identification & Sample Collection Information (Please type or use block print)

Public Water System ID: (Must be 7 digits; include all zeros) TX

Public Water System Name:

County:

Report Results To:

Name: Texan Water
Address: 161 Industrial loop
City: Fredericksburg
State: TX Zip Code: 78624
Phone #: 512-943-5646

Relinquished By (Sampler): [signature] Date / Time: 7/27/21 11:25am
Received By (Courier, if applicable): Date / Time:
Relinquished By (Courier): Date / Time:

Sampler Name (Print): Joseph Dottavio
Signature: [signature]
Operator License #:
☐ Owner ☐ Operator Other:

Falsification of this form or tampering with water samples is a crime punishable under state and/or federal law. (Texas Penal Code, Title 8, Chapter 37.10) By signing this form, the sampler acknowledges that samples were collected according to the systems established sample collection procedures, and that all information is accurate.

Upper Leon River Municipal Water District

2250 Hwy 2861 Comanche TX 76442
p (254) 879-2228 | f (254) 879-2020
ulrmwd.com | lab@ulrmwd.com
Mon-Wed 8a - 4p Thurs 8a - 12p

TCEQ Laboratory ID: T104704395

Test Results must meet all accreditation/certification requirements unless stated otherwise.

SHADED AREA FOR LABORATORY USE ONLY

Sample Iced? ☑ Yes ☐ No
Received By (Lab): [signature] Date / Time: 7-27-21 11:25

Thermometer ID: 19201615[illegible]
Measured Temperature: 20.1 °C
Corrected Temperature: 20.4 °C

Incubation Date & Time
Begin — Date: 7-27-21 Time: 13:05
End — Date: 7-28-21 Time: 13:25

Lab Comments:

Tested By: [initials]
Laboratory Approval: [signature] Date: 7-28-21 Time: 13:50
Report to Client By: [initials] Date: 7-28-21 Time: 13:50

Lab Results — Test Method: SM 9223B (Colilert)

NOTE: All test results relate only to the samples received.

Sample Identification/Location (Use Specific Address/Location identified in Sample Siting Plan; Raw Wells - Use Source ID for Well Sampled (Example: G1234567A))	Routine (Distribution)	Repeat	Raw Well	Special*	Construction*	Month	Day	Year	Time (Please circle AM or PM)	Replacement	Sample ID & Date of Originating Sample (All Repeat, Replacement, & Triggered Raw Samples)	Chlorine Residual (Circle "F" for Free "T" for Total) (mg/L)	Rejection Code (if applicable) Please Resubmit §	Chlorine ✓ Absent	Chlorine ✓ Present	Total Coliform Absent	Total Coliform Present	E. coli Absent	E. coli Present	Laboratory Sample ID Number
Twisted CREEK #1						7	27	21	9:50 am	☐		F T		☑	☐	☐	☑	☑	☐	21-0727-02
Twisted creek #2						7	27	21	9:51 am	☐		F T		☑	☐	☐	☑	☑	☐	21-0727-03
									am pm	☐		F T		☐	☐	☐	☐	☐	☐	
									am pm	☐		F T		☐	☐	☐	☐	☐	☐	
									am pm	☐		F T		☐	☐	☐	☐	☐	☐	
									am pm	☐		F T		☐	☐	☐	☐	☐	☐	
									am pm	☐		F T		☐	☐	☐	☐	☐	☐	
									am pm	☐		F T		☐	☐	☐	☐	☐	☐	
									am pm	☐		F T		☐	☐	☐	☐	☐	☐	
									am pm	☐		F T		☐	☐	☐	☐	☐	☐	

§Sample Unsuitable for Analysis REJECTION CODES
BR=Broken in Transit; CL=Chlorine present (in sample); EH=Exceed Hold Time; EV=Excessive Volume; FZ=Frozen Sample; HB=Heavy Bacterial Growth; ST=Heavy Silt or Turbidity Present; IN=Insufficient Sample Information; BP=Invalid Sampling Point; IP=Invalid Sampling Protocol; LA=Lab Accident; LR=Lab Rejected; LT=Leaked in Transit; NC=No Chlorine Residual (on form); VO=Volume Insufficient

Form instructions: www.tceq.texas.gov/drinkingwater/microbial/revised-total-coliform-rule
*Special and Construction samples are NOT FOR COMPLIANCE
This form has been revised from the original TCEQ form to meed project-specific/quality system requirements for Upper Leon River Municipal Water District

TCEQ Microbial Reporting Form

TCEQ Form 10525
08/2017

Water System Identification & Sample Collection Information (Please type or use block print)

Public Water System ID: (Must be 7 digits; include all zeros) TX

Public Water System Name:

County:

Report Results To:

Name: Texun Water
Address: 161 Industrial loop
City: Fredericksburg
State: TX Zip Code: 78624
Phone #: 512-993-5646

Relinquished By (Sampler): [signature] Date / Time: 7/27/21 11:25 AM
Received By (Courier, if applicable): Date / Time:
Relinquished By (Courier): Date / Time:

Sampler Name (Print): Joseph Dottavio
Signature: [signature]
Operator License #:
☐ Owner ☐ Operator Other:

Falsification of this form or tampering with water samples is a crime punishable under state and/or federal law. (Texas Penal Code, Title 8, Chapter 37.10) By signing this form, the sampler acknowledges that samples were collected according to the systems established sample collection procedures, and that all information is accurate.

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ulrmwd.com | lab@ulrmwd.com
Mon-Wed 8a - 4p Thurs 8a - 12p

TCEQ Laboratory ID: T104704395

Test Results must meet all accreditation/certification requirements unless stated otherwise.

SHADED AREA FOR LABORATORY USE ONLY

Sample Iced? ☑ Yes ☐ No
Received By (Lab): [signature] Date / Time: 7-27-21 11:25

Measured Temperature: 19.9 °C
Thermometer ID: 1920/6154
Corrected Temperature: 20.2 °C

Incubation Date & Time
Begin — Date: 7-27-21 Time: 13:05
End — Date: 7-28-21 Time: 13:25

Lab Comments:
Tested By: [signature]
Laboratory Approval: [signature] Date: 7-28-21 Time: 13:50
Report to Client By: [signature] Date: 7-28-21 Time: 13:50

NOTE: All test results relate only to the samples received.

Lab Results — Test Method: SM 9223B (Colilert)

Sample Identification/Location (Use Specific Address/Location identified in Sample Siting Plan; Raw Wells - Use Source ID for Well Sampled (Example: G1234567A))	Routine (Distribution)	Repeat	Raw Well	Special*	Construction*	Month	Day	Year	Time (Please circle AM or PM)	Replacement	Sample ID & Date of Originating Sample (All Repeat, Replacement, & Triggered Raw Samples)	Chlorine Residual (Circle "F" for Free "T" for Total) (mg/L)	Rejection Code (if applicable) Please Resubmit §	Chlorine ✓ Absent	Chlorine ✓ Present	Total Coliform Absent	Total Coliform Present	E. coli Absent	E. coli Present	Laboratory Sample ID Number
Mystic Mountain #1						7	27	21	10:14 am	☐		F / T		☑	☐	☐	☑	☑	☐	21-0727-04
Mystic Mountain #2						7	27	21	10:15 am	☐		F / T		☑	☐	☐	☑	☑	☐	21-0727-05
									am / pm	☐		F / T		☐	☐	☐	☐	☐	☐	
									am / pm	☐		F / T		☐	☐	☐	☐	☐	☐	
									am / pm	☐		F / T		☐	☐	☐	☐	☐	☐	
									am / pm	☐		F / T		☐	☐	☐	☐	☐	☐	
									am / pm	☐		F / T		☐	☐	☐	☐	☐	☐	
									am / pm	☐		F / T		☐	☐	☐	☐	☐	☐	
									am / pm	☐		F / T		☐	☐	☐	☐	☐	☐	
									am / pm	☐		F / T		☐	☐	☐	☐	☐	☐	

§Sample Unsuitable for Analysis REJECTION CODES

BR=Broken in Transit	EH=Exceed Hold Time	FZ=Frozen Sample	ST=Heavy Silt or Turbidity Present	BP=Invalid Sampling Point	LA=Lab Accident	LT=Leaked in Transit	VO=Volume Insufficient
CL=Chlorine present (in sample)	EV=Excessive Volume	HB=Heavy Bacterial Growth	IN=Insufficient Sample Information	IP=Invalid Sampling Protocol	LR=Lab Rejected	NC=No Chlorine Residual (on form)	

Form instructions: www.tceq.texas.gov/drinkingwater/microbial/revised-total-coliform-rule
*Special and Construction samples are NOT FOR COMPLIANCE
This form has been revised from the original TCEQ form to meed project-specific/quality system requirements for Upper Leon River Municipal Water District