Report of Findings: WRGS 20-004

Report of Findings
Red Oak Mountain Subdivision
Groundwater Availability Certification for Platting: Blanco County, Texas

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

Wet Rock Groundwater Services, L.L.C.
Groundwater Specialists
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WRGS 20-004

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July 2020

WRGS Project No. 083-001-20

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The seal appearing on this document was authorized by Kaveh Khorzad, P.G. 1126 on July 27, 2020:

Kaveh Khorzad, P.G.
License No. 1126

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 Red Oak Mountain Subdivision (Red Oak 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.

The subdivision is located along Maenius Rd. approximately 9 miles west of the City of Blanco in western Blanco County (Figure 1). The proposed subdivision is documented within the Blanco County Tax Assessor as Property ID: 83463. Lone Star Land Partners, LLC (P.O. Box 1987 Marble Falls, TX 78654) is the plat applicant.

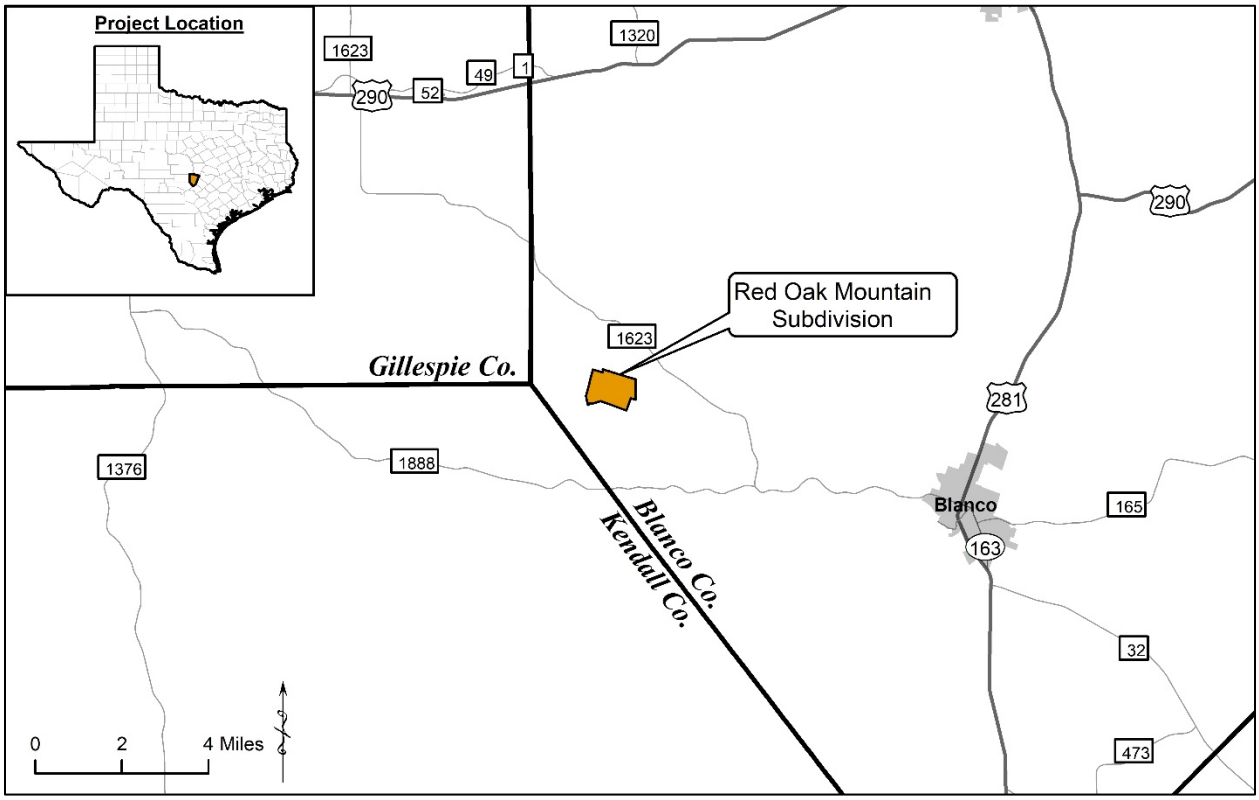


Figure 1: Location map

Lone Star Land Partners, LLC proposes to develop the approximately 492.66 acre property as a subdivision including 82 single family residential lots. The average lot size is 6.01 acres which will be served by individual water wells. The subdivision is located within the jurisdiction of the Blanco-Pedernales Groundwater Conservation District (BPGCD). Figure 2 provides a map showing the general location of the subdivision with the county and groundwater district boundaries.

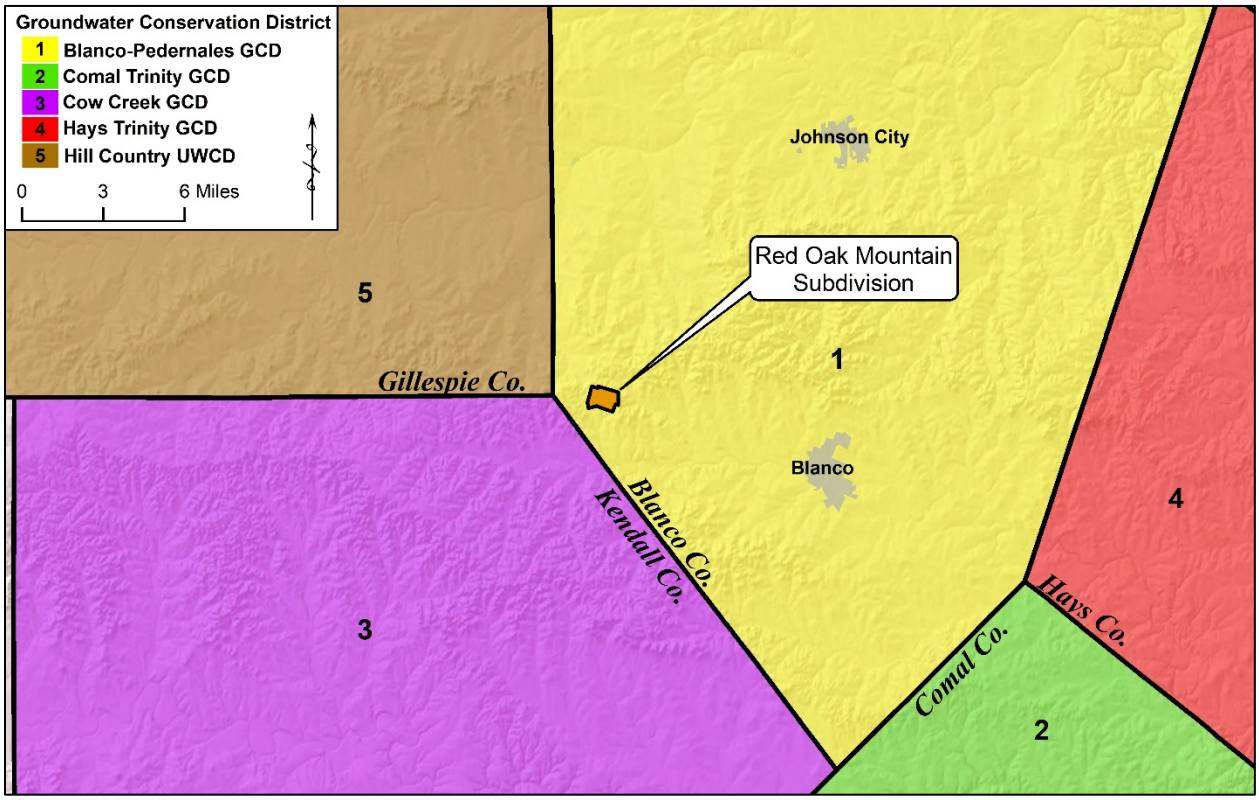


Figure 2: Groundwater Conservation District map

Section II: Projected Water Demand Estimate

The Blanco County development rules and regulations require applicants to use the following formula when calculating demand for a subdivision:

Equation 1: Total Water Demand

$$Q_s = n \times 3.5 \times 100 \times 365 \text{ days} = 10{,}475{,}500 \text{ gallons/year or } 32.15 \text{ acre-feet/year}$$

Where:

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

n = Number of connections (82 lots);

3.5 = Average number of persons per household; and

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

Equation 2: Water Demand per Housing Unit

$$Q_h = 3.5 \times 100 \times 365 \text{ days} = 127{,}750 \text{ gallons/year or } 0.39 \text{ acre-feet/year}$$

Where:

Q_h = Total Water Demand per house per year

Equation 1 assumes 3.5 persons per household using 100 gallons per person per day which results in a total water demand for the subdivision of 32.15 acre-feet/year. Equation 2 results in a water demand per housing unit of 0.39 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 are two (2) major aquifers (Trinity and Edwards-Trinity (Plateau) and three (3) minor aquifers (Marble Falls, Hickory, and Ellenburger-San Saba) within Blanco County that supply groundwater resources. 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. Of these aquifers, all are present at the study area excluding the Marble Falls Aquifer. These aquifers are regionally extensive aquifer systems made up of Cretaceous carbonates and Paleozoic carbonates and sandstones that were deposited throughout central Texas. These aquifers are affected by geologic structures which include the Llano Uplift, the San Marcos Arch, and the Balcones fault system (Ashworth, 1983).

III.2. Stratigraphy and Geologic History

The subdivision overlies the Cretaceous aged sedimentary rocks comprising the Trinity and the Edwards-Trinity (Plateau) Aquifers. The Upper Member of the Glen Rose Formation and the Fort Terrett Formation of the Edwards Group crop out over the vast majority of the subdivision's surface; the Fort Terrett Formation is exposed at higher elevations. The sediments that comprise these groups 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.

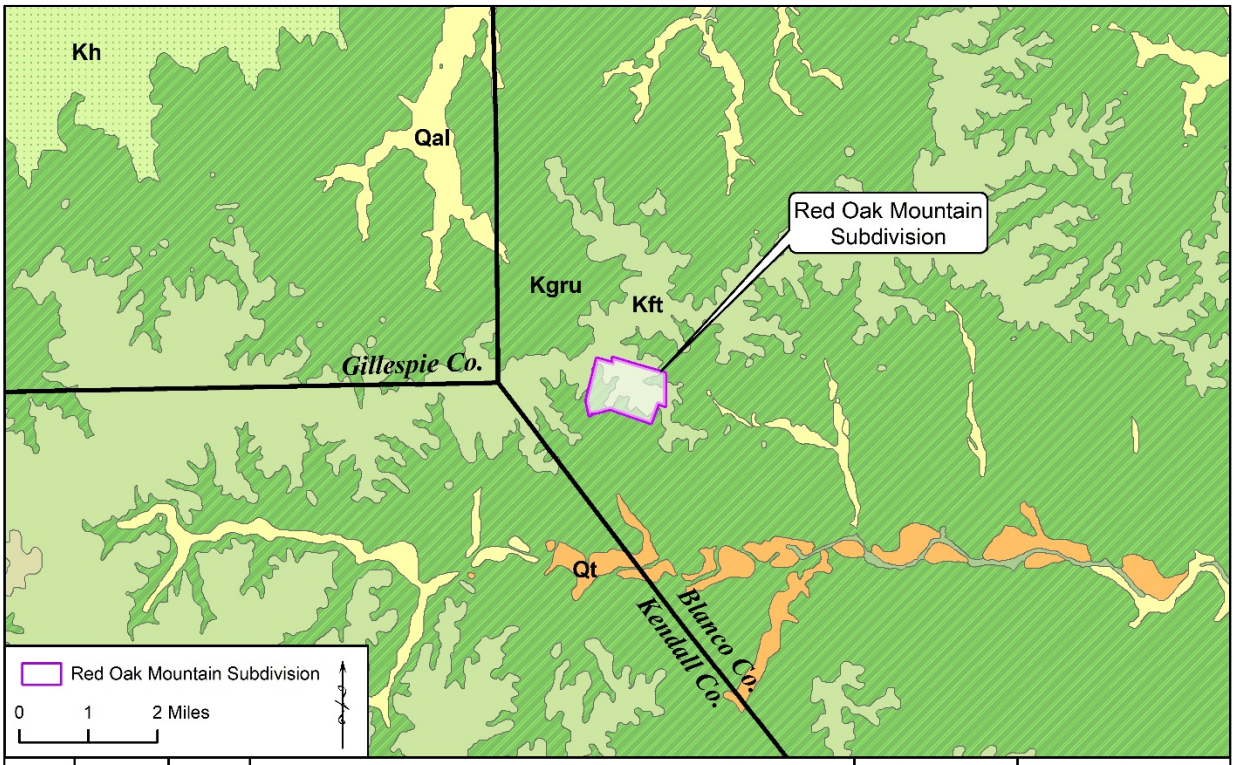
Making up the base of the study area lies the Cambrian aged Moore Hollow Group which consists of the Riley and Wilberns Formations. The oldest member of the Riley Formation is the Hickory Sandstone consisting of cross bedded terrestrial and marine quartz sandstones, siltstones, and mudstones which make up the Hickory Aquifer. In certain areas the Cap Mountain limestone overlies the Hickory, acting as a confining unit. The youngest member of the Riley Formation, the Lion Mountain Sandstone, is intermittently found overlying the Cap Mountain Limestone. The Welge Sandstone, the oldest member of the Wilberns Group, is hydraulically connected to the Lion Mountain forming the Mid-Cambrian Aquifer. The Morgan Creek Limestone and the Point Peak Shale are found directly above the Welge Sandstone and act as a confining unit between the Mid-Cambrian and the Ellenburger-San Saba aquifers. Completing the Wilberns Group is the San Saba Limestone which is the stratigraphically lowest part of the Ellenburger-San Saba Aquifer (Figure 3; Barnes and Bell, 1977; Preston et. al, 1996).

On top of the Moore Hollow Group is the Ordovician aged Ellenburger Group which consists of the Tanyard, Gorman, and Honeycut Formations and generally encircle the Llano Uplift. The Tanyard Formation is divided into two members: the basal dolostone Threadgill Member, and the overlying limestone Staendebach Member. Above the Tanyard, the Gorman and Honeycut Formations are comprised of dolostones and limestones which complete the Ellenburger Group and the Ellenburger-San Saba Aquifer (Figure 3; Preston et. al, 1996).

Scattered discontinuously throughout the Llano Uplift area are Devonian and Mississippian aged formations consisting of thin remnants of dark shales, petroliferous limestones, crinoidal limestone, chert breccias, fractured cherts, and microgranular limestones with bedded chert (Standen and Ruggiero, 2007; Preston et. al, 1996). Where present, the formations act as confining layers between the Ellenburger-San Saba Aquifer and the Marble Falls Aquifer (Figure 3; Preston et. al, 1996).

Pennsylvanian aged rocks unconformably overlie either the Ellenburger Group or the Devonian-Mississippian Formations. Groups making up this system include the Bend, Canyon, and Strawn Groups. The oldest member of the Bend Group is the Marble Falls Limestone, which is locally divided and makes up the Marble Falls Aquifer. The lower unit consists of massive limestone and reef deposits and the upper unit consists of fine grained bedded limestone with chert nodules and beds. The overlying Smithwick Formation consists of interbedded claystone, siltstone, and sandstone. Above the Bend Group are the Strawn and Canyon Groups comprised of limestones, shales, and fine-grained sandstones. Together with the Smithwick Formation, these groups act as confining units above the Marble Falls Aquifer (Figure 3; Preston et. al, 1996).

Cretaceous aged rocks overlie the Pennsylvanian system. The Cretaceous sediments comprising the Trinity and Edwards Groups were deposited by a shallow Cretaceous sea and once covered the entire region, but have since been eroded away completely in some areas. The Trinity Group is divided into three aquifers from oldest to youngest: The Lower, Middle and Upper Trinity Aquifers. Formations comprising the Lower Trinity Aquifer include, from oldest to youngest, the Hosston Sand Member and Sligo Limestone Member of the Travis Peak Formation. Updip in some parts of the outcrop, the equivalent rocks of the Hosston and Sligo are called the Sycamore sand. Above the Lower Trinity Aquifer is a confining unit separating the Lower Trinity Aquifer from the Middle Trinity Aquifer called the Hammett Shale. The Middle Trinity Aquifer is composed of from oldest to youngest, the Cow Creek Limestone, the Bexar Shale, and the Hensell Sand Members of the Travis Peak Formation and the Lower Glen Rose Formation. Above the Middle Trinity Aquifer is the Upper Trinity Aquifer composed of the Upper Glen Rose Formation, which completes the Trinity Group. Above the Trinity Group, lies the confining Walnut Formation and the Edwards Group. The Edwards Group consists of the Fort Terrett and Segovia Formations (collectively known as Edwards Limestone).



ERA	System	Group	Formation	Legend	Member	Hydrogeologic Unit
Cenozoic	Quaternary		Pleistocene to Recent floodplain (alluvium and fluviatile terrace deposits)	Qal; Qat; Qt, Qc, Qcf		localized alluvial aquifers
Mesozoic	Cretaceous	Edwards	Segovia	Ks		Edwards Plateau Aquifer (Edwards-Trinity Aquifer)
			Fort Terrett	Kft, Ked	Kirchburg evaporite; Dolomite Mbr.; Burrowed Mbr.	
			Walnut Formation	Kwa		confining bed
		Trinity	Glen Rose Lmst.	Kgr, Kgru, Kgrl	Upper Mbr.; Lower Mbr.	Upper Trinity Aquifer
			Hensell Sand / Bexar Shale (Travis Peak Equivalent)	Kh		Middle Trinity Aquifer
			Cow Creek Lmst. (Travis Peak Equivalent)	Kcc, Kch		
			Hammett Shale (Travis Peak Equivalent)	Kha		confining bed
			Sycamore Sand / Sligo / Hosston (Travis Peak Equivalent)	Ksy		Lower Trinity Aquifer
Paleozoic	Pennsylvanian	Canyon	Undivided	IPcn	Undivided	confining beds
		Strawn	Undivided	IPst		
		Bend	Smithwick	IPsw		
			Marble Falls Lmst.	IPmf		Marble Falls Aquifer
	Missippian and Devonian		Mississippian and Devonian Undivided rocks	MD		usually confining beds
	Ordovician	Ellenburger	Honeycut	Oh	Undivided	Ellenburger-San Saba Aquifer
			Gorman	Og	Undivided	
			Tanyard	Ot	Staendebach Mbr.; Threadgill Mbr.	
	Cambrian	Moore Hollow	Wilberns	Cws	San Saba Mbr.	
				Cwp	Point Peak Mbr.	confining beds
				Cwm	Morgan Creek Lmst.; Welge Sndst. Mbr.	Mid-Cambrian Aquifer
			Riley	Crc	Lion Mtn. Sndst.; Cap Mtn. Lmst.	confining beds
				Crh	Hickory Sandstone	Hickory Aquifer

Figure 3: Geologic map and stratigraphic column (modified from McGeehee, 1979; Preston et. al, 1996)

III.3. Hydrogeology

There are both major and minor aquifers within the vicinity of the proposed Red Oak Mountain. The main source of groundwater in the area 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 Trinity Aquifer in the Hill Country area spans as far north as Gillespie County and as far south as Bexar, Comal, and Hays counties where fresh water can be produced. Figure 4 shows the location of the Trinity Aquifer with respect to other aquifers in the area, including the Edwards-Trinity (Plateau) Aquifer, Ellenburger-San Saba, and Hickory aquifers. 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. The Edwards-Trinity (Plateau), Hickory, and Ellenburger-San Saba aquifers provide relatively little water to wells in the immediate vicinity and are not a significant a source of water to the proposed subdivision.

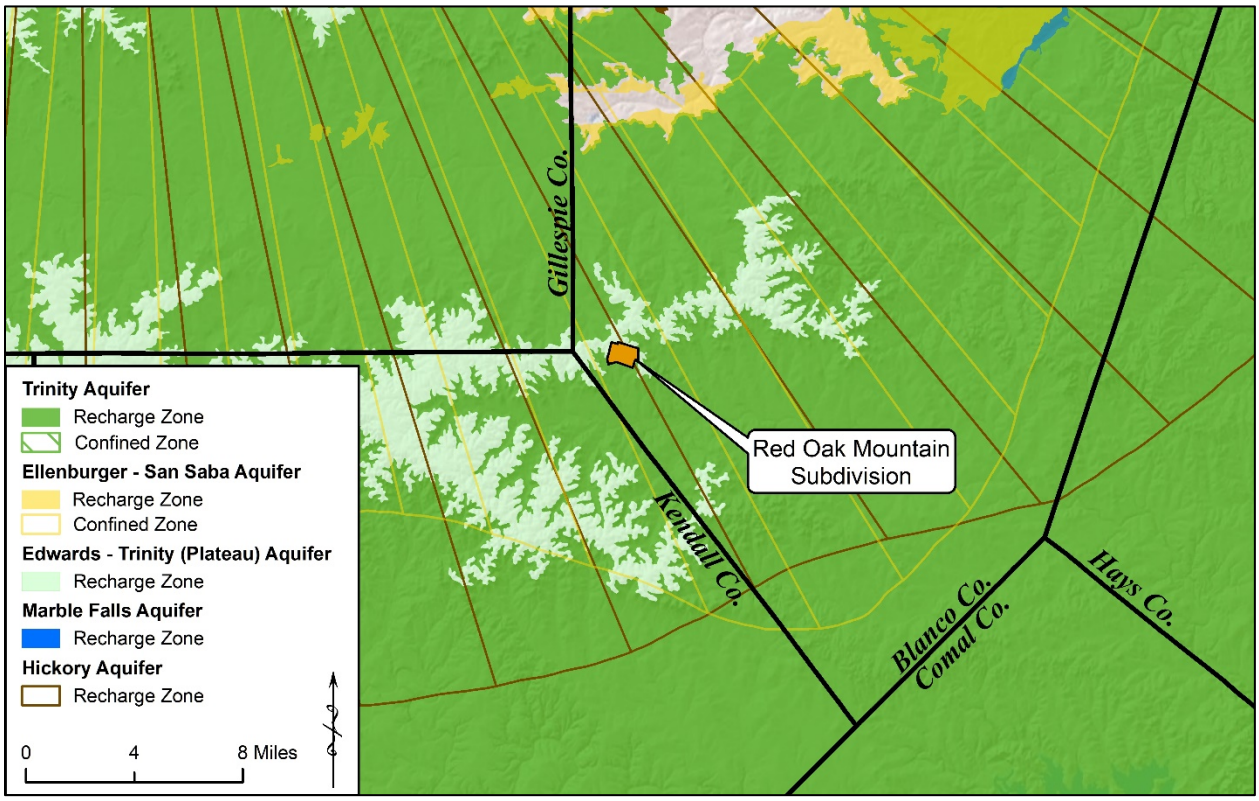


Figure 4: Aquifer map

The Upper Trinity Aquifer typically produces poor quality water due to the presence of gypsum and anhydrite layers within the Upper Glen Rose Formation and typically produces lower quantities of water. The Middle Trinity Aquifer contains the Lower Glen Rose Limestone, Hensell Sand, and Cow Creek Limestone and is separated from the Upper Trinity Aquifer by the presence of a fossil marker bed called the Corbula Bed. The Corbula bed is a heavily fossiliferous layer that contains the small fossil clam called *Corbula martinae*.

Typically, the highest yielding portion of the Trinity Aquifer is the Middle Trinity Aquifer, specifically the Lower Glen Rose Formation and the Cow Creek Limestone Member of the Travis Peak Formation (Figure 3). These formations are, in some localities, heavily fractured limestone, making them more productive because of their enhanced ability to transmit groundwater. In some areas, the Lower Glen Rose Formation contains the presence of a reef deposit which greatly increases the yield of a well due to its high permeability. Well yield may be increased through acidization, with increases of two or three fold obtained in some instances. The Lower Trinity Aquifer is composed of conglomerates and sandstones that are, in some instances, heavily cemented. The degree of cementing of these sediments controls the ability of water to move through the aquifer, thereby limiting the ability to produce large yielding wells. In localized areas, wells in the Lower Trinity Aquifer may produce moderate yields, although regionally the Middle Trinity Aquifer produces higher yielding wells with better quality water as compared to the Lower Trinity Aquifer.

The water quality of a well completed within the Middle Trinity Aquifer depends upon several factors, including the degree of fracturing, the amount of time the groundwater is in contact with the rock 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. Additionally, groundwater that has traveled a longer distance and has had longer contact time with aquifer sediments will also typically contain higher Total Dissolved Solids (TDS) than groundwater that has been in contact with the same rock for a shorter amount of time.

Underlying the Cretaceous rocks is the Ellenburger-San Saba Aquifer which extends from Coleman County south to Kendall County (Figure 4). The aquifer surrounds the Llano uplift and dips radially into the subsurface away from the center of the uplift. The aquifer is made up of the limestone and dolomite sequences of the Tanyard, Gorman, and Honeycut formations of the Ellenburger Group and the San Saba Limestone Member of the Wilberns Formation. Regional block faulting has left the aquifer highly compartmentalized and yields greatly depend on local geologic conditions. In the northern and northwestern portions of Blanco County, significant development of subsurface solution features has occurred in the aquifer resulting in yields greater than 200 gallons per minute (gpm). In most places the aquifer produces yields between 3 and 45 gpm with very good quality water, with the only concern being low to moderate hardness (Folleett, 1973).

The Hickory Aquifer is the basal aquifer in the area near the proposed subdivision (Figure 4). The Hickory Aquifer has a similar structure to that of the Ellenburger-San Saba with a similar extent and a radial dip away from the Llano Uplift. The aquifer consists of the Hickory Sandstone Member of the Riley Formation. The Hickory yields low to moderate quantities of water and water quality is variable. In Blanco County, the quality can be fresh to saline with reports of yields up to 30 gpm (Folleett, 1973).

Section IV: Aquifer Testing

IV.1. Well Details

Prior to this study, there were two existing wells (Well No. 1 and Well No. 2) documented within the boundaries of the Red Oak Mountain property. Six (6) new wells were constructed by Apex Drilling, Inc. between June 10 and June 17, 2020. The existing wells were completed in the Middle and Lower Trinity aquifers and each of the newly constructed wells are completed in the Middle Trinity Aquifer. Figure 5 provides a map showing the locations of the wells and their respective use during aquifer testing; wells shown in blue were used as pumping wells, wells shown in pink were used as observation wells. Table 1 provides a well construction summary; Figures 6 through 9 provide illustrations showing formation depths and well construction. Appendix C provides the state well reports for the wells. A suite of downhole geophysical logs (gamma ray, spontaneous potential, and four-point resistivity) were performed by BPGCD staff on four of the wells; Appendix B provides the available geophysical logs for the wells (Wells No. 1, 2, 4, and 8).

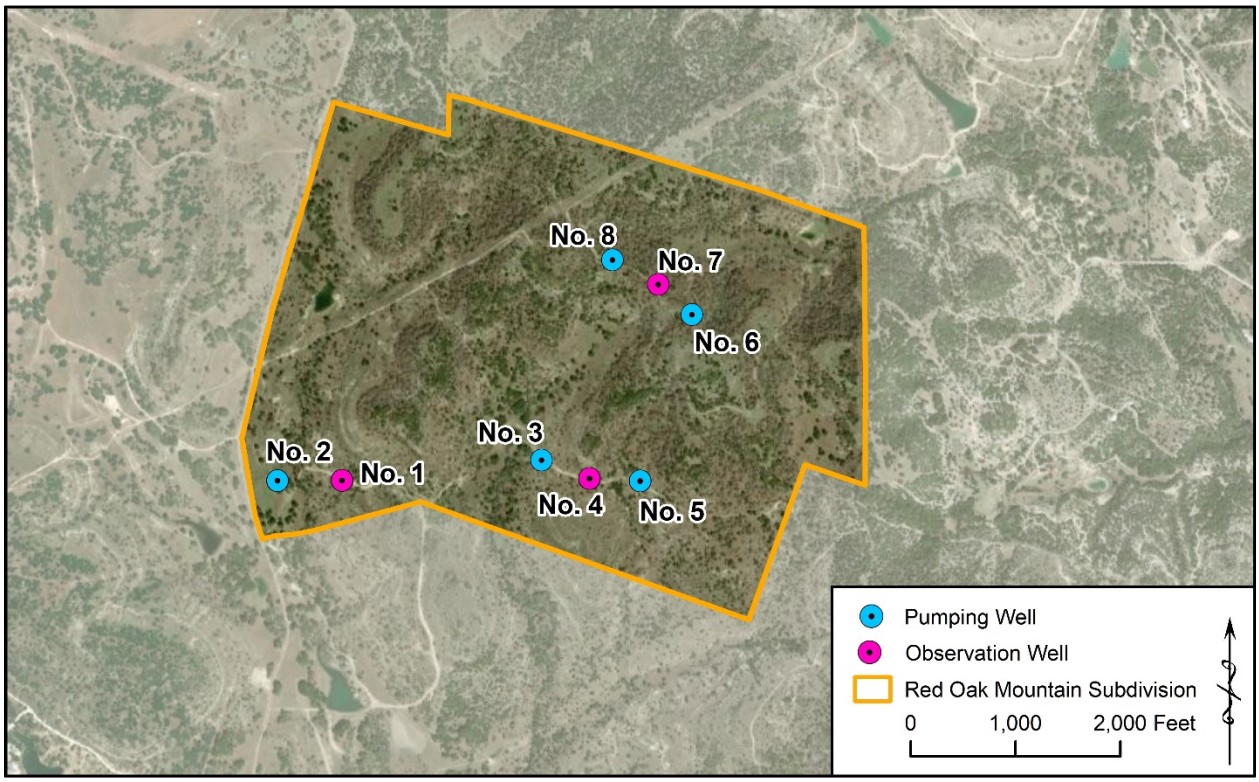


Figure 5: Well location map

To meet the guidelines for the Blanco County development rules and regulations and to adequately assess the availability of groundwater within the vicinity of the proposed subdivision, five (5) different aquifer tests were conducted. The aquifer tests 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 geophysical logs conducted by BPGCD on Wells No. 1, No. 2, No. 4, and No. 8, the pumping wells used in the tests are completed in the Middle Trinity Aquifer. The following provides a summary of the well construction for the two (2) existing wells and six (6) newly constructed wells used in the tests:

Well No. 1 (Existing Well)

According to the State Well Report (Tracking No. 527800; Appendix C), Well No. 1 was completed by Apex Drilling, Inc. on November 4, 2019. The well was drilled to a total depth of 605 feet below ground level (ft. bgl) with a 8 1/2-inch borehole from 0 to 50 ft. bgl and a 6 1/4-inch borehole from 50 to 605 ft. bgl. The well was completed with 4 1/2-inch PVC casing set from +2 to 425 ft. bgl and 465 to 585 ft. bgl with 4 1/2-inch screen from 425 to 465 ft. bgl and 585 to 605 ft. bgl. According to the State Well Report, the well was jetted via airlifting with the drilling rig at 15 to 17 gpm upon completion. The June 30, 2020 geophysical log run by BPGCD on Well No. 1 indicates that the well is screened in within the Cow Creek Limestone of the Middle Trinity Aquifer; and partially within the Lower Trinity Aquifer (Appendix B).

Well No. 2 (Existing Well)

According to the State Well Report (Tracking No. 527801; Appendix C), Well No. 2 was completed by Apex Drilling, Inc. on November 5, 2019. The well was drilled to a total depth of 460 ft. bgl with a 8 1/2-inch borehole from 0 to 50 ft. bgl and a 6 1/4-inch borehole from 50 to 460 ft. bgl. The well was completed with 4 1/2-inch PVC casing set from +2 to 380 ft. bgl and 440 to 460 ft. bgl with 4 1/2-inch screen from 380 to 440 ft. bgl. According to the State Well Report, the well was jetted via airlifting with the drilling rig at 60 gpm upon completion. The June 30, 2020 geophysical log run by BPGCD on Well No. 2 indicates that the well is screened in within the Cow Creek Limestone of the Middle Trinity Aquifer (Appendix B).

Well No. 3

According to the State Well Report (Tracking No. 546839; Appendix C), Well No. 3 was completed by Apex Drilling, Inc. on June 10, 2020. The well was drilled to a total depth of 535 ft. bgl with a 8 1/2-inch borehole from 0 to 50 ft. bgl and a 6 1/4-inch borehole from 50 to 535 ft. bgl. The well was completed with 4 1/2-inch PVC casing set from +2 to 455 ft. bgl and 515 to 535 ft. bgl with 4 1/2-inch screen from 455 to 515 ft. bgl. According to the State Well Report, the well was jetted via airlifting with the drilling rig at 24 gpm upon completion.

Well No. 4

According to the State Well Report (Tracking No. 546840; Appendix C), Well No. 4 was completed by Apex Drilling, Inc. on June 11, 2020. The well was drilled to a total depth of 545 ft. bgl with a 8 1/2-inch borehole from 0 to 50 ft. bgl and a 6 1/4-inch borehole from 50 to 545 ft. bgl. The well was completed with 4 1/2-inch PVC casing set from +2 to 465 ft. bgl and 525 to 545 ft. bgl with 4 1/2-inch screen from 465 to 525 ft. bgl. According to the State Well Report, the well was jetted via airlifting with the drilling rig at 35 gpm upon completion. The June 30, 2020 geophysical log run by BPGCD on Well No. 4 indicates that the well is screened in within the Cow Creek Limestone of the Middle Trinity Aquifer (Appendix B).

Well No. 5

According to the State Well Report (Tracking No. 546842; Appendix C), Well No. 5 was completed by Apex Drilling, Inc. on June 12, 2020. The well was drilled to a total depth of 525 ft. bgl with a 8 1/2-inch borehole from 0 to 50 ft. bgl and a 6 1/4-inch borehole from 50 to 525 ft. bgl. The well was completed with 4 1/2-inch PVC casing set from +2 to 445 ft. bgl and 505 to 525 ft. bgl with 4 1/2-inch screen from 445 to 505 ft. bgl. According to the State Well Report, the well was jetted via airlifting with the drilling rig at 60 gpm upon completion.

Well No. 6

According to the State Well Report (Tracking No. 546843; Appendix C), Well No. 6 was completed by Apex Drilling, Inc. on June 17, 2020. The well was drilled to a depth of 645 ft. bgl with a 8 1/2-inch borehole from 0 to 50 ft. bgl and a 6 1/4-inch borehole from 50 to 645 ft. bgl. The well was completed with 4 1/2-inch PVC casing set from +2 to 565 ft. bgl and 625 to 645 ft. bgl with 4 1/2-inch screen from 565 to 625 ft. bgl. According to the State Well Report, the well was jetted via airlifting with the drilling rig at 40 gpm upon completion.

Well No. 7

According to the State Well Report (Tracking No. 546844; Appendix C), Well No. 7 was completed by Apex Drilling, Inc. on June 16, 2020. The well was drilled to a total depth of 625 ft. bgl with a 8 1/2-inch borehole from 0 to 50 ft. bgl and a 6 1/4-inch borehole from 50 to 625 ft. bgl. The well was completed with 4 1/2-inch PVC casing set from +2 to 545 ft. bgl and 605 to 625 ft. bgl with 4 1/2-inch screen from 545 to 605 ft. bgl. According to the State Well Report, the well was jetted via airlifting with the drilling rig at 60 gpm upon completion.

Well No. 8

According to the State Well Report (Tracking No. 546845; Appendix C), Well No. 8 was completed by Apex Drilling, Inc. on November 5, 2019. The well was drilled to a total depth of 645 ft. bgl with a 8 1/2-inch borehole from 0 to 50 ft. bgl and a 6 1/4-inch borehole from 50 to 645 ft. bgl. The well was completed with 4 1/2-inch PVC casing set from +2 to 585 ft. bgl and 625 to 645 ft. bgl with 4 1/2-inch screen from 585 to 625 ft. bgl. According to the State Well Report, the well was jetted via airlifting with the drilling rig at 15 to 17 gpm upon completion. The June 30, 2020 geophysical log run by BPGCD on Well No. 8 indicates that the well is screened in within the Cow Creek Limestone of the Middle Trinity Aquifer (Appendix B).

Table 1: Summary of Red Oak Mountain well construction

Well	Tracking No.	Latitude	Longitude	Elevation (ft. MSL)	Date Completed	Aquifer	Well Depth (ft. bgs)	Static Water Level (ft. bgs; date; ft. MSL)	Borehole (diameter; ft. bgs)	Casing (diameter; material; ft. bgs)	Screen (diameter; material; ft. bgs)
Well No. 1	527800	30° 08' 01" N	98° 33' 48" W	1,664	11/4/2019	Middle Trinity	605	283.16 (6/15/2020) 1,380.84	8 1/2" (8-50) 6 1/4" (50-605)	4 1/2" PVC (+2-425) (465-585)	4 1/2" PVC Screen (425-465) (585-605)
Well No. 2	527801	30° 08' 01" N	98° 33' 55" W	1,649	11/5/2019	Middle Trinity	460	270.30 (6/15/2020) 1,378.70	8 1/2" (0-50) 6 1/4" (50-460)	4 1/2" PVC (+2-380) (440-460)	4 1/2" PVC Screen (380-440)
Well No. 3	546839	30° 08' 02" N	98° 33' 25" W	1,728	6/10/2020	Middle Trinity	535	352.61 (6/17/2020) 1,379.39	8" (0-50) 6 1/4" (50-535)	4 1/2" PVC (+2-455) (515-535)	4 1/2" PVC Screen (455-515)
Well No. 4	546840	30° 08' 01" N	98° 33' 23" W	1,744	6/11/2020	Middle Trinity	545	366.45 (6/17/2020) 1,367.55	8" (0-50) 6 1/4" (50-545)	4 1/2" PVC (+2-465) (525-545)	4 1/2" PVC Screen (465-525)
Well No. 5	546842	30° 08' 01" N	98° 33' 17" W	1,726	6/12/2020	Middle Trinity	525	345.98 (6/22/2020) 1,380.02	8" (0-50) 6 1/4" (50-525)	4 1/2" PVC (+2-445) (505-525)	4 1/2" PVC Screen (445-505)
Well No. 6	546843	30° 08' 16" N	98° 33' 10" W	1,830	6/17/2020	Middle Trinity	645	453.00 (6/29/2020) 1,377.00	8" (0-50) 6 1/4" (50-645)	4 1/2" PVC (+2-565) (625-645)	4 1/2" PVC Screen (565-625)
Well No. 7	546844	30° 08' 19" N	98° 33' 14" W	1,821	6/16/2020	Middle Trinity	625	446.07 (6/24/2020) 1,374.93	8" (0-50) 6 1/4" (50-625)	4 1/2" PVC (+2-545) (605-625)	4 1/2" PVC Screen (545-605)
Well No. 8	546845	30° 08' 22" N	98° 33' 20" W	1,832	6/15/2020	Middle Trinity	645	458.56 (6/24/2020) 1,373.44	8" (0-50) 6 1/4" (50-645)	4 1/2" PVC (+2-565) (625-645)	4 1/2" PVC Screen (565-625)

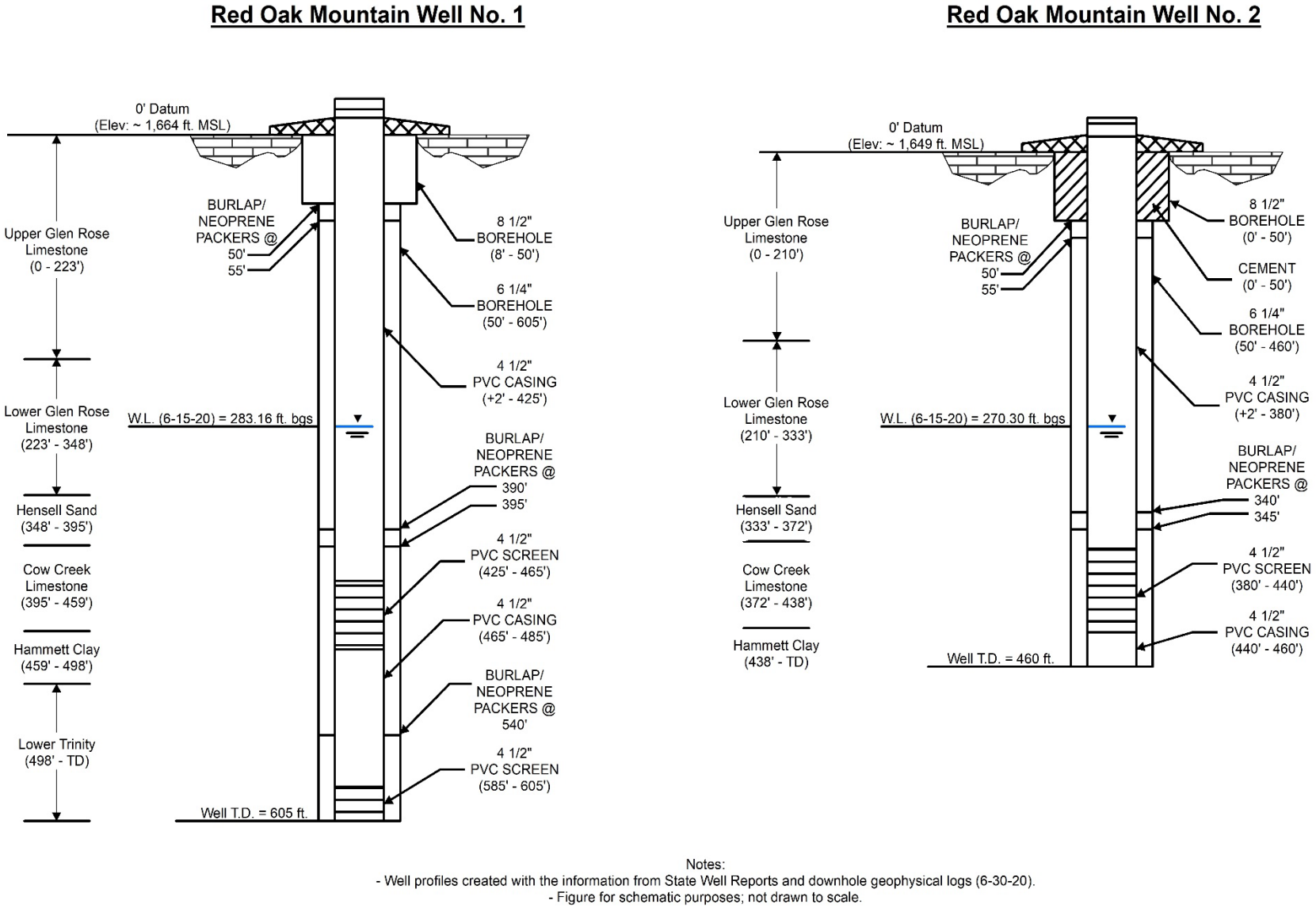
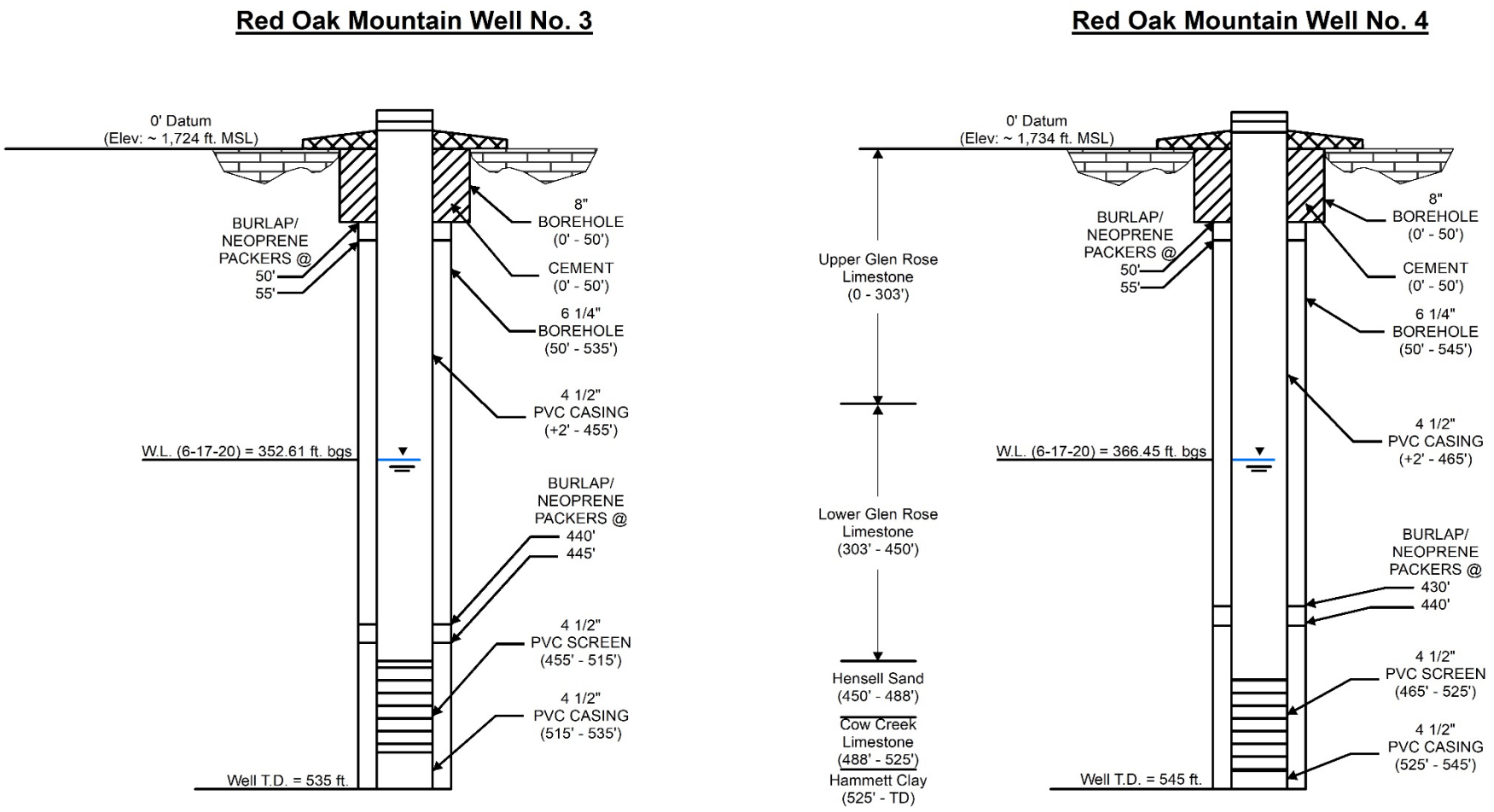
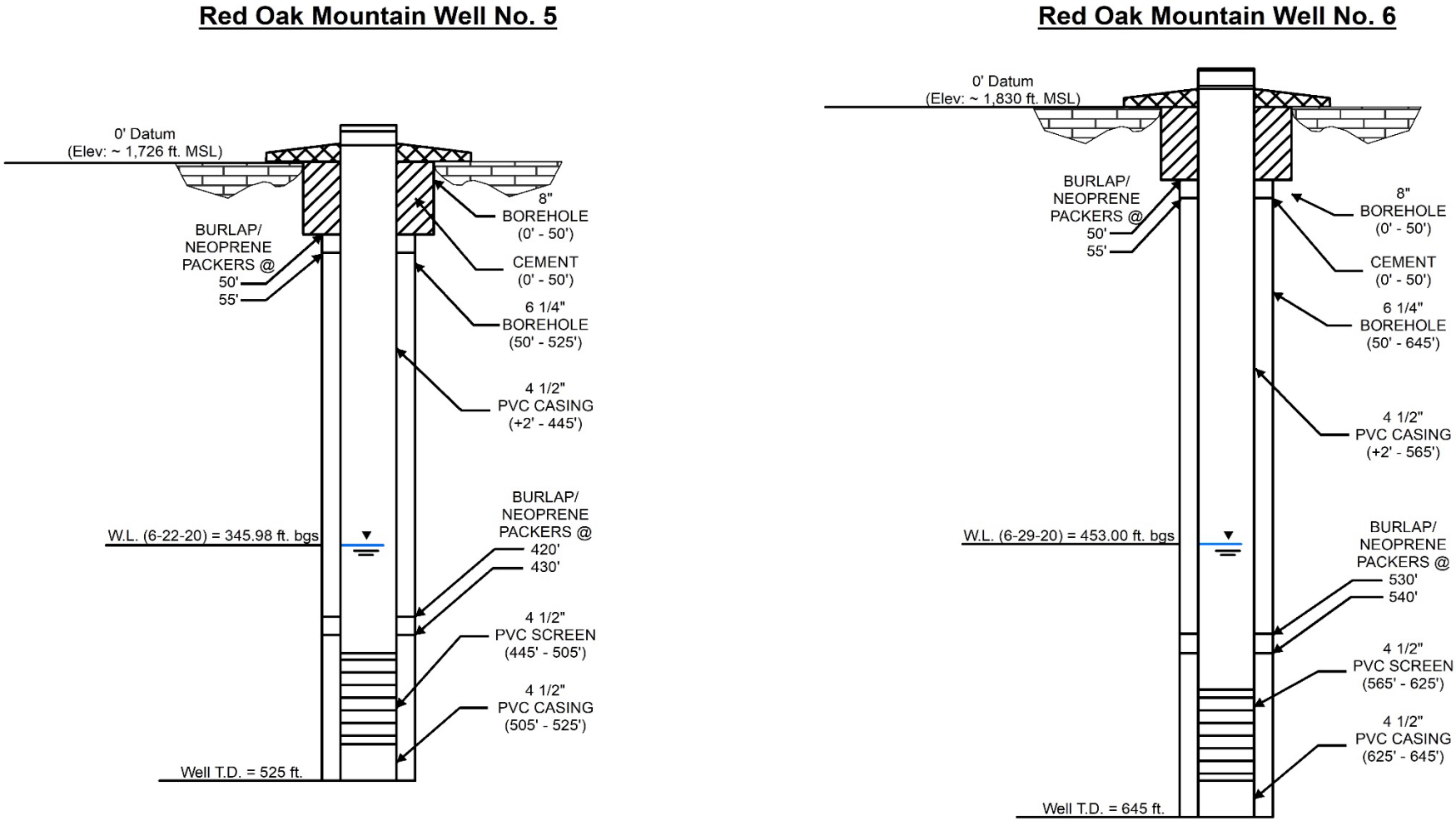


Figure 6: Well construction profiles of Wells No. 1 and No. 2.



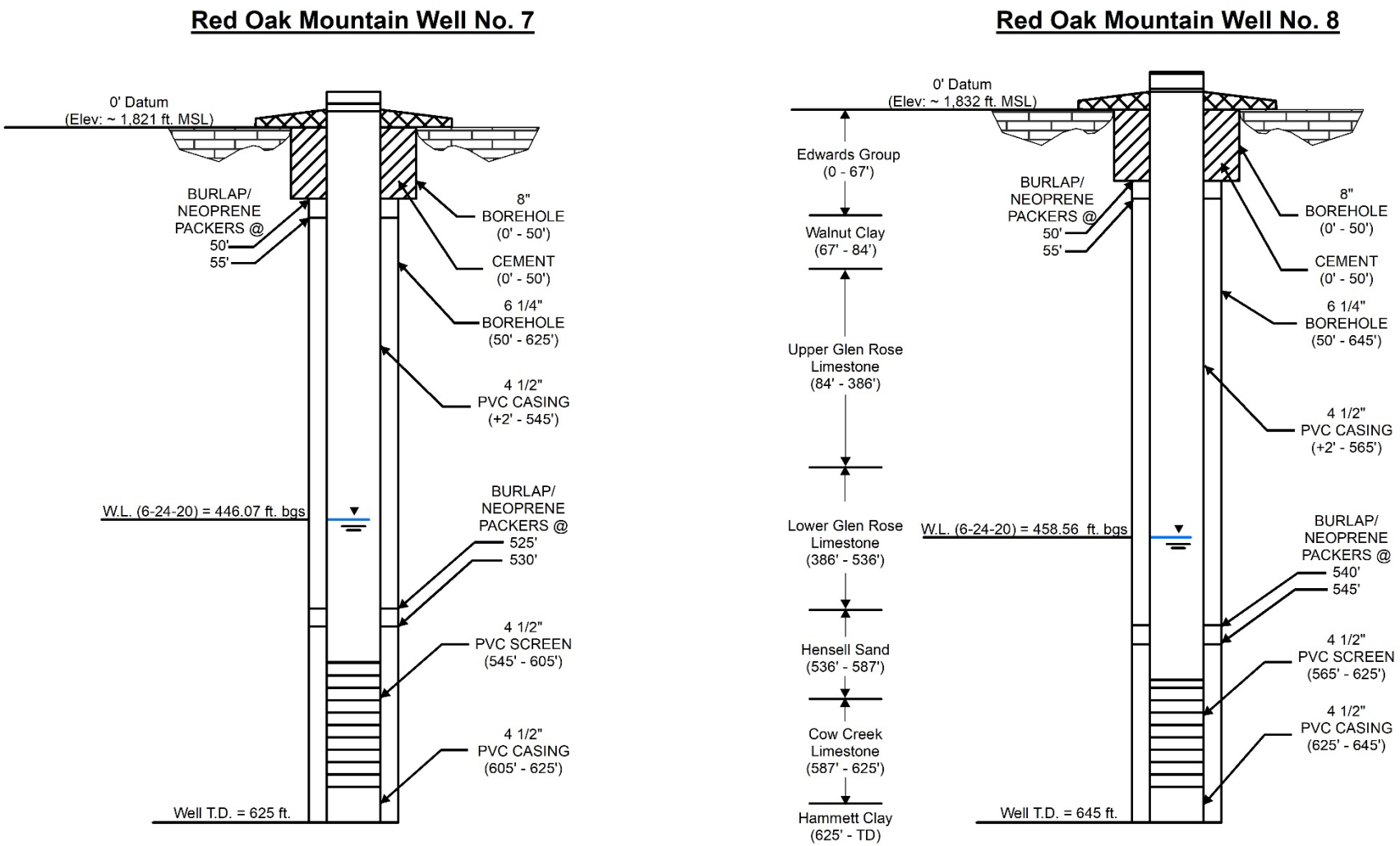
Notes:
- Well profiles created with the information from State Well Reports and downhole geophysical logs (6-30-20).
- Figure for schematic purposes; not drawn to scale.

Figure 7: Well construction profiles of Wells No. 3 and No. 4



Notes:
- Well profiles created with the information from State Well Reports and downhole geophysical logs (7-24-19).
- Figure for schematic purposes; not drawn to scale.

Figure 8: Well construction profiles of Wells No. 5 and No. 6



Notes:
- Well profiles created with the information from State Well Reports and downhole geophysical logs (6-30-20).
- Figure for schematic purposes; not drawn to scale.

Figure 9: Well construction profiles of Wells No. 7 and No. 8

IV.2. Aquifer Testing

Five (5) aquifer tests were performed to assess the hydrogeologic properties of the Middle Trinity Aquifer within the subdivision. For each aquifer test, Apex Drilling, Inc. 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 each test. Meter readings and water levels were taken prior to, during, and at the conclusion of the tests. Each 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 2 provides a summary of the aquifer testing results; Appendix D provides the results of the aquifer analysis; and Appendix E provides well efficiency calculations for each well.

IV.2.1. Aquifer Test of Well No. 2 (June 15, 2020)

The aquifer test of Well No. 2 (pumping well) was conducted on June 15, 2020 with Well No. 1 serving as the observation well approximately 612 feet away. A 5 horsepower (HP) submersible pump was set in the pumping well on 420 feet of 1 1/4-inch PVC column pipe. The pump was started at 12:58 P.M. on June 15, 2020; the water level was monitored for 24.42 hours of pumping and 19.78 hours of recovery. Prior to the pumping phase of the aquifer test, the static water level of the pumping well was measured at 270.3 ft. bgl (1,378.7 ft. MSL) and the static water level of the observation well was measured at 283.2 ft. bgl (1,380.8 ft. MSL).

Well No. 2 was pumped at an average rate of 26 gpm and the final measured pump rate was 26 gpm with 69.57 feet of drawdown, resulting in a specific capacity of 0.37 gpm/ft. When compared to the theoretical specific capacity (0.14 gpm/ft.), Well No. 2 produced at an efficiency of 264%. The Cooper-Jacob analysis resulted in a transmissivity of 40.2 ft^2/day, and a hydraulic conductivity of 0.21 ft./day. A maximum drawdown of 23.11 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 2.2×10^{-5} for Well No. 1. Figure 10 provides a hydrograph of the pumping well and temperature over the duration of the aquifer test; Figure 11 provides a hydrograph of both the pumping and observation wells over the duration of the test.

The water level within Well No. 2 declined steadily throughout most of the pumping phase, and reached a nearly stable pumping level towards the end of the pumping phase at approximately 340 ft. bgl (Figure 10). The water level in the observation well displayed an observable response related to starting and stopping the pump in Well No. 1 (Figure 11). After the pump was shut off, recovery was measured in both wells; the water level in the pumping well recovered 85% in approximately 19 hours. There were no aquifer boundary conditions observed during the testing.

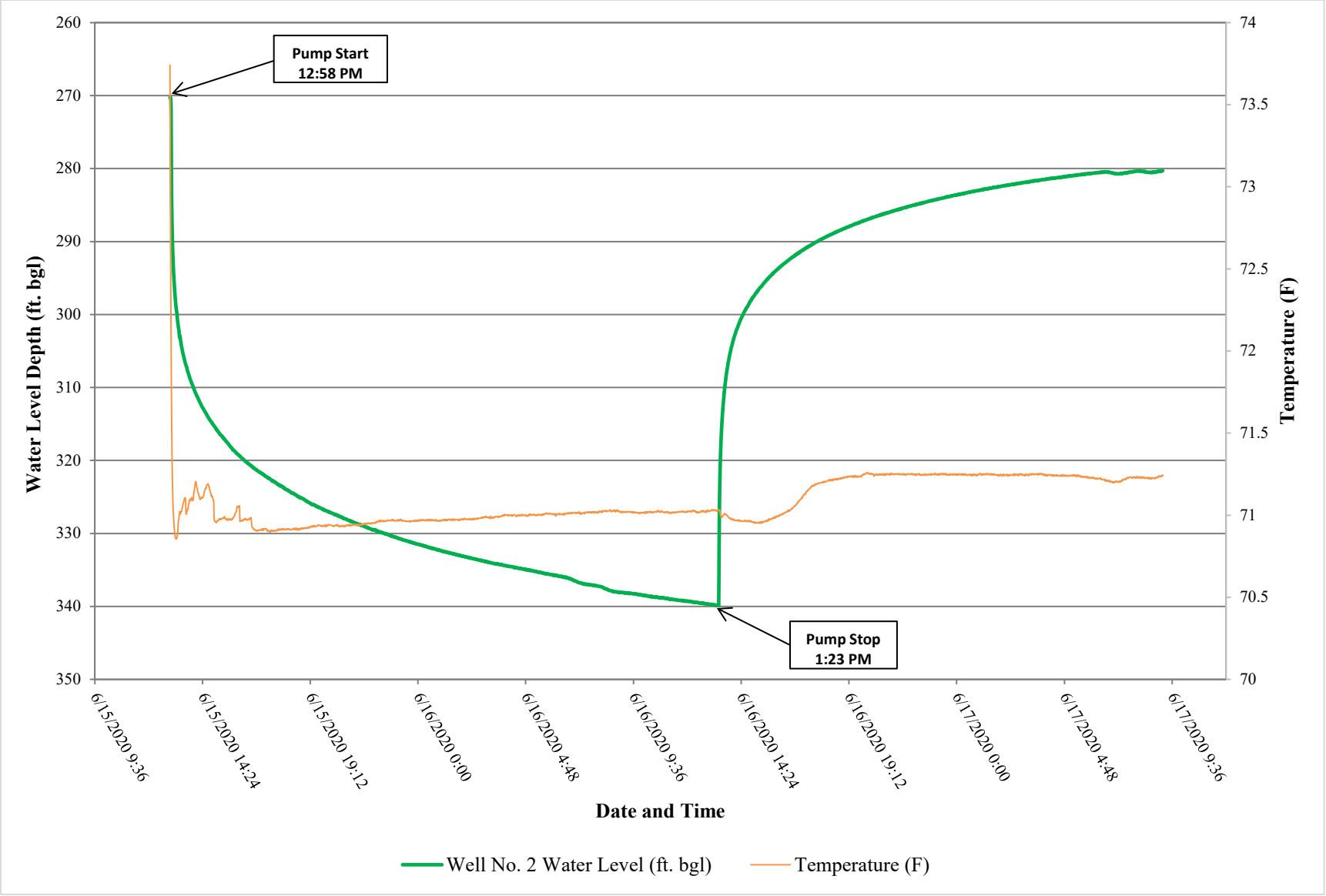


Figure 10: Aquifer test hydrograph of Well No. 2 (June 15, 2020)

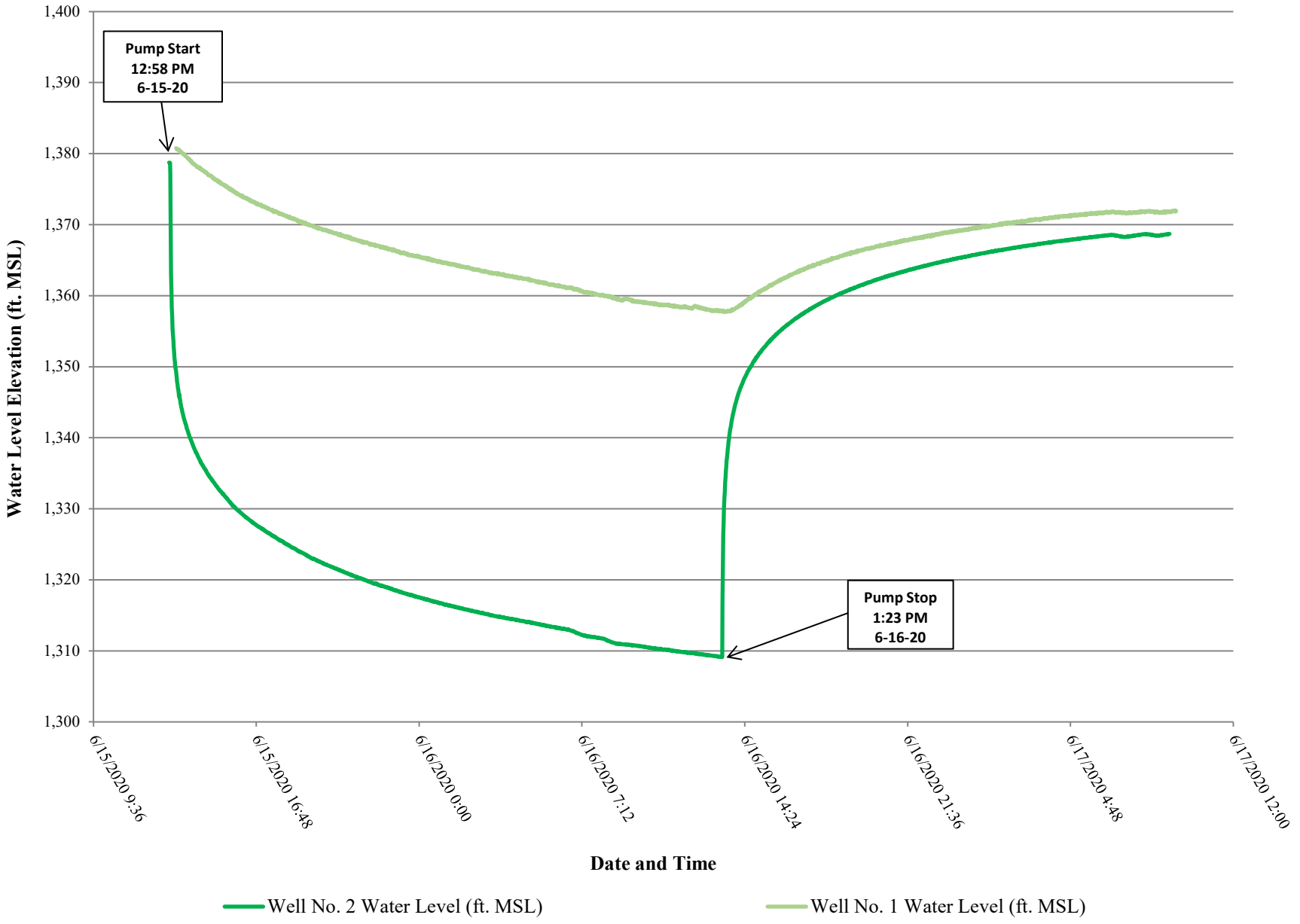


Figure 11: Aquifer test hydrograph of Well No. 2 and Observation Well No. 1 (June 15, 2020)

IV.2.2. Aquifer Test of Well No. 3 (June 17, 2020)

The aquifer test of Well No. 3 (pumping well) was conducted on June 17, 2020 with Well No. 4 serving as the observation well approximately 240 feet away. A 3 HP submersible pump was set in the pumping well on 500 feet of 1 1/4-inch PVC column pipe. The pump was started at 10:41 A.M. on June 17, 2020; the water level was monitored for 24.25 hours of pumping and 46.48 hours of recovery. Prior to the pumping phase of the aquifer test, the static water level of the pumping well was measured at 352.6 ft. bgl (1,375.4 ft. MSL) and the static water level of the observation well was measured at 366.5 ft. bgl (1,377.5 ft. MSL).

Well No. 3 was pumped at an average rate of 13 gpm and the final measured pump rate was 13 gpm with 58.43 feet of drawdown, resulting in a specific capacity of 0.22 gpm/ft. When compared to the theoretical specific capacity (0.22 gpm/ft.), Well No. 3 produced at an efficiency of 100%. The Cooper-Jacob analysis resulted in a transmissivity of 64.9 ft^2/day, and a hydraulic conductivity of 0.36 ft./day. A maximum drawdown of 58.05 feet was observed in the observation well, indicating a strong hydraulic connection between the wells, perhaps due to fracture connectivity. Due to the observed hydraulic connection, we calculated a storativity value of 1.63×10^{-5} for Well No. 4. Figure 12 provides a hydrograph of the pumping well and temperature over the duration of the aquifer test; Figure 13 provides a hydrograph of both the pumping and observation wells over the duration of the test.

Initially, the pumping level rapidly decreased in Well No. 3; however, approximately 200 minutes into the pumping phase, the water level began to stabilize between 408 and 411 ft. bgl for the remainder of the pumping phase of the aquifer test (Figure 12). The observation well displayed a direct response to starting and stopping the pump in Well No. 3 (Figure 13). After the pump was shut off, recovery was measured in both wells; the water level in the pumping well recovered 90% in approximately 75 minutes. There were no aquifer boundary conditions observed during the testing.

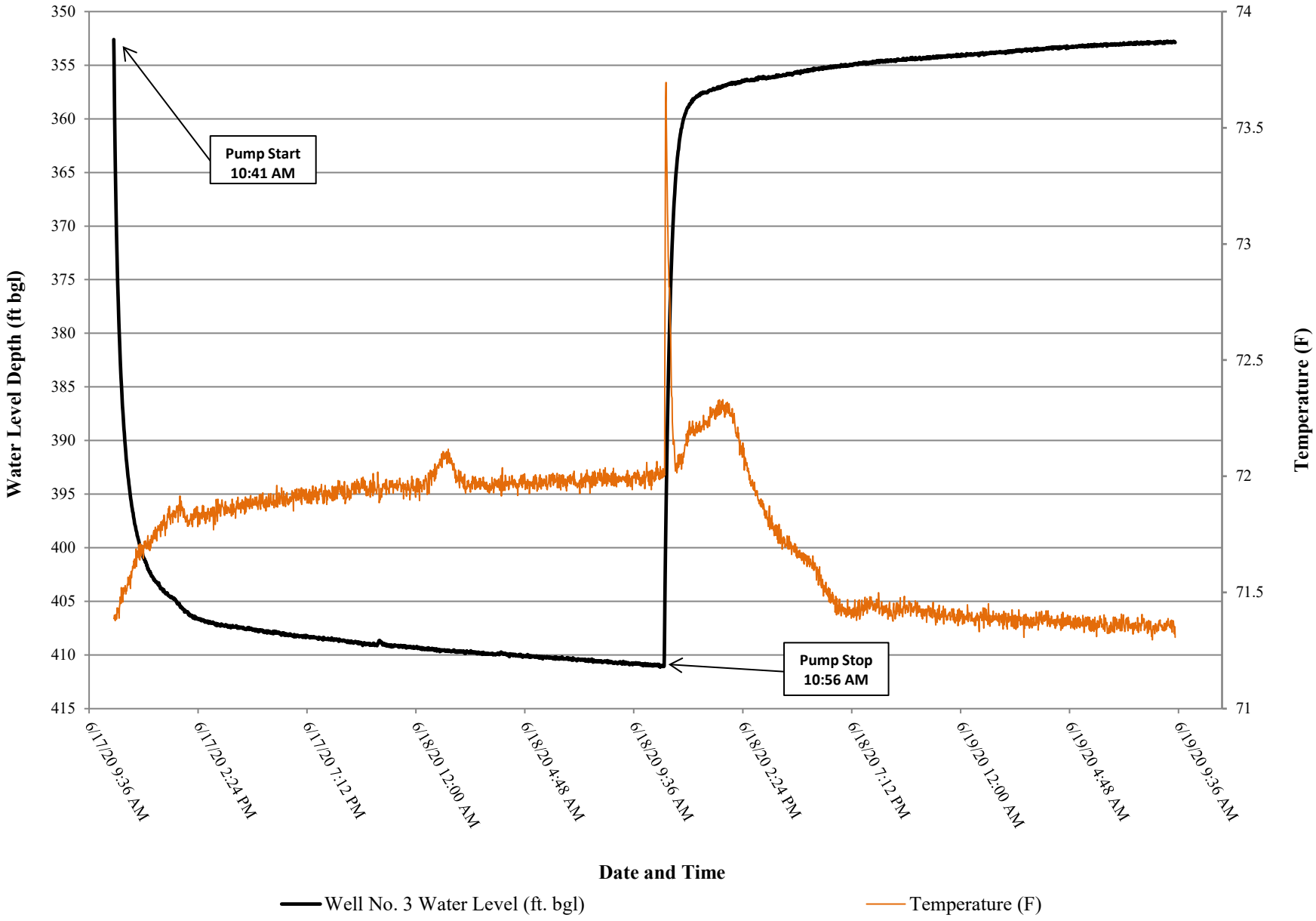


Figure 12: Aquifer test hydrograph of Well No. 3 (June 17, 2020)

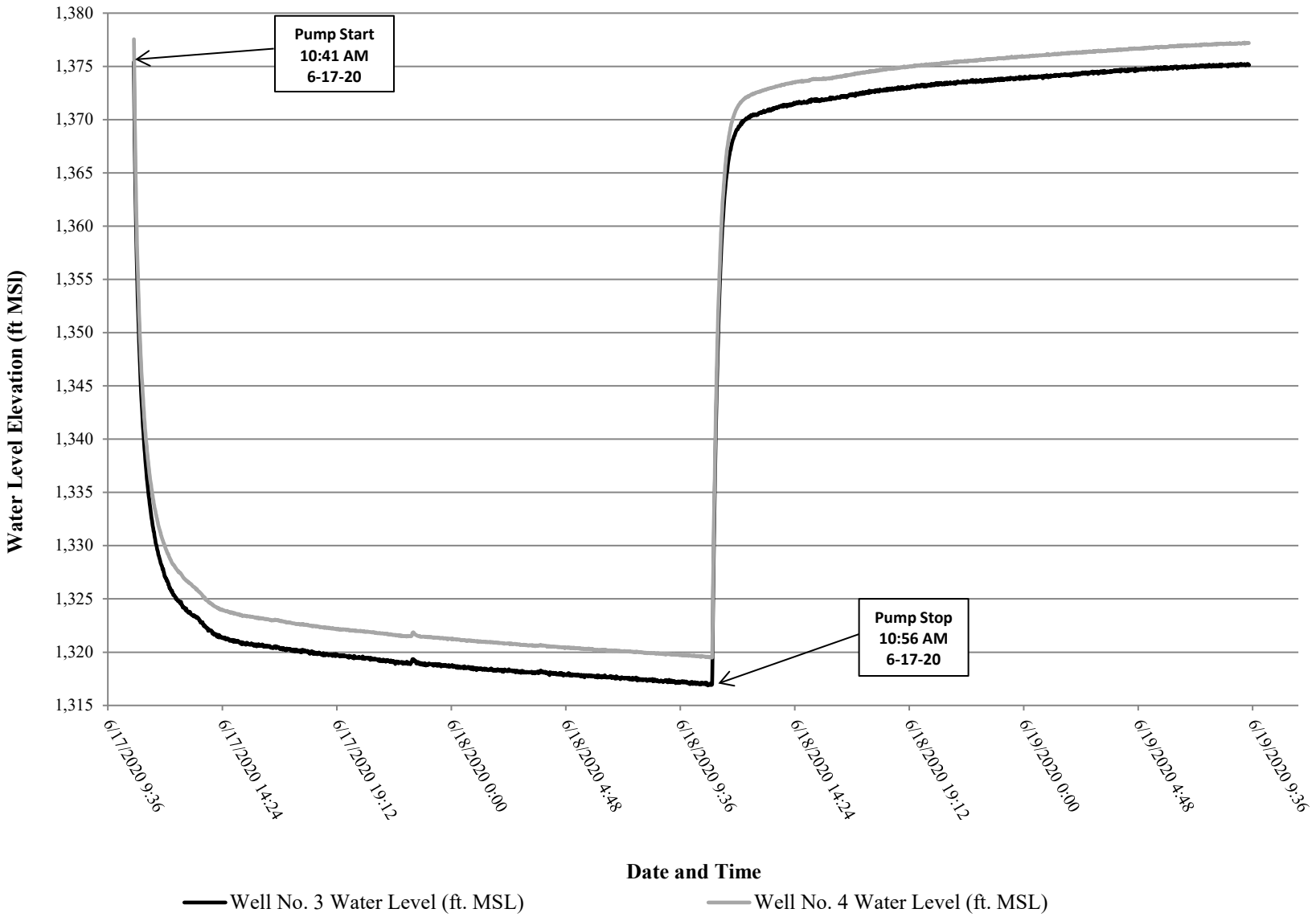


Figure 13: Aquifer test hydrograph of Well No. 3 and Observation Well No. 4 (June 17, 2020)

IV.2.3. Aquifer Test of Well No. 5 (June 22, 2020)

The aquifer test of Well No. 5 (pumping well) was conducted on June 22, 2020 with Well No. 4 serving as the observation well approximately 512 feet away. A 5 HP submersible pump was set in the pumping well on 480 feet of 1 1/4-inch PVC column pipe. The pump was started at 10:35 A.M. on June 22, 2020; the water level was monitored for 24.28 hours of pumping and 24.33 hours of recovery. Prior to the pumping phase of the aquifer test, the static water level of the pumping well was measured at 345.9 ft. bgl (1,380.1 ft. MSL) and the static water level of the observation well was measured at 362.4 ft. bgl (1,381.6 ft. MSL).

Well No. 5 was pumped at an average rate of 24 gpm and the final measured pump rate was 24 gpm with 17.56 feet of drawdown, resulting in a specific capacity of 1.37 gpm/ft. When compared to the theoretical specific capacity (0.24 gpm/ft.), Well No. 5 produced at an efficiency of 571%. The Cooper-Jacob analysis resulted in a transmissivity of 68.2 ft^2/day, and a hydraulic conductivity of 0.38 ft./day. A maximum drawdown of 13.57 feet was observed in Well No. 4, indicating a hydraulic connection between the two wells. Due to the observed hydraulic connection, we calculated a storativity value of 4.90×10^{-5} for Well No. 4. Figure 14 provides a hydrograph of the pumping well and temperature over the duration of the aquifer test; Figure 15 provides a hydrograph of both the pumping and observation wells over the duration of the test.

The water level within Well No. 5 declined steadily throughout most of the pumping phase of the aquifer test, and did not reach a stable pumping level (Figure 14). The water level in the observation well displayed an observable response related to starting and stopping the pump in Well No. 5 (Figure 15). After the pump was shut off, recovery was measured in both wells; the water level in the pumping well recovered 70% in approximately 24 hours. Near the end of the pumping phase of the aquifer, a possible recharge boundary was reached, causing the pumping level to rise slightly (Figure 14). Shortly after, a possible no-flow boundary was reached, causing the water level to decline (Figure 14).

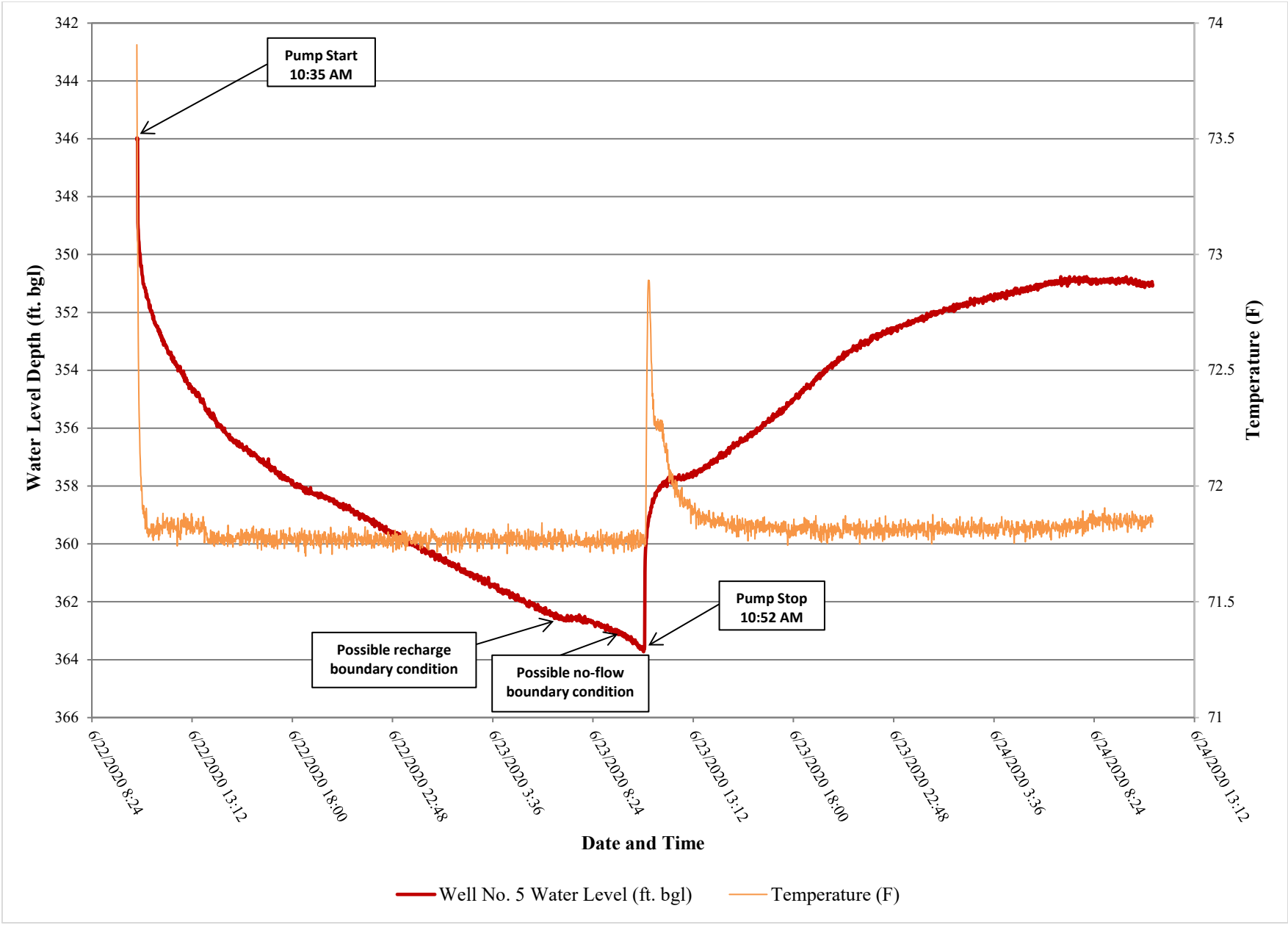


Figure 14: Aquifer test hydrograph of Well No. 5 (June 22, 2020)

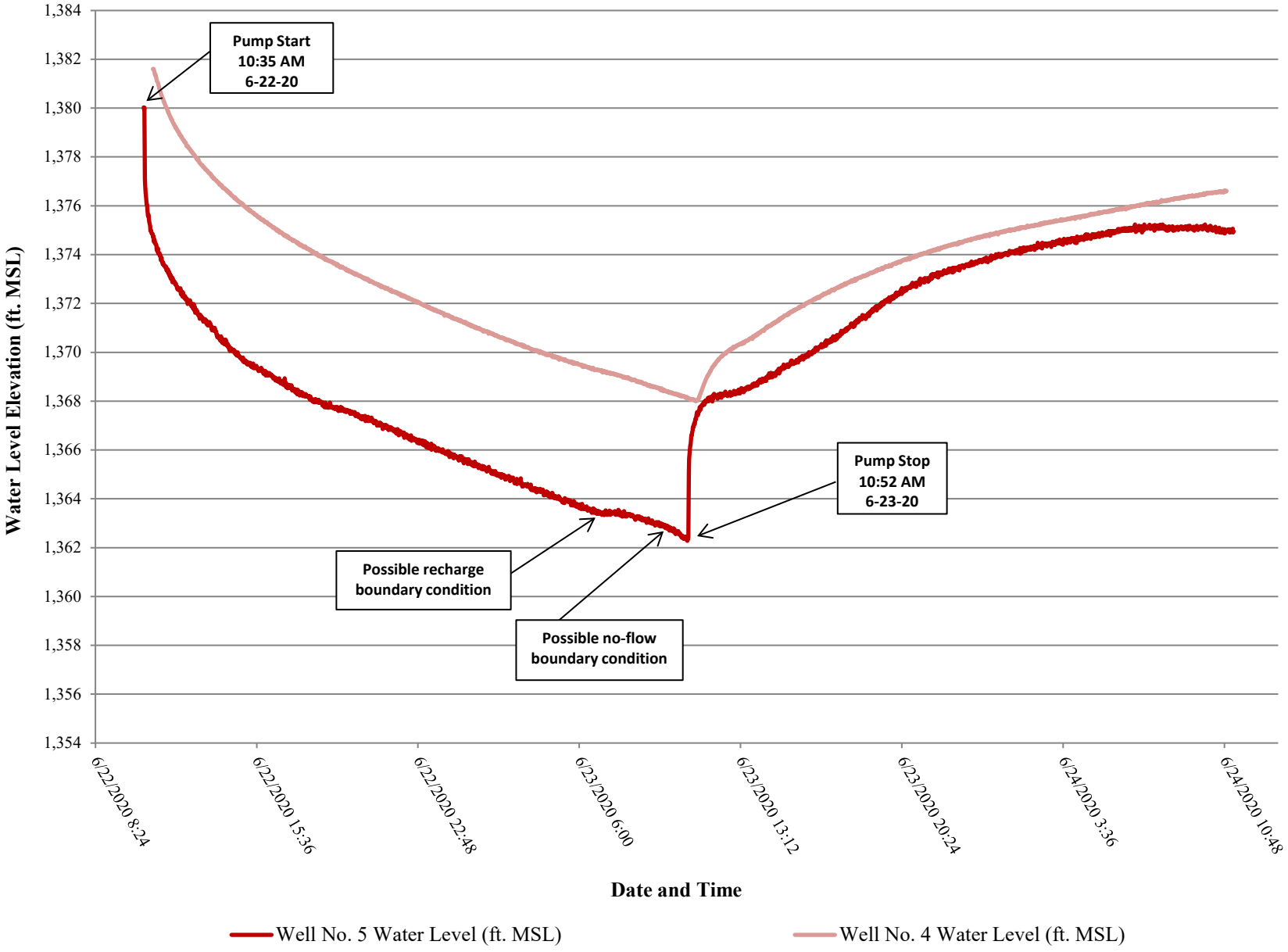


Figure 15: Aquifer test hydrograph of Well No. 5 and Observation Well No. 4 (June 22, 2020)

IV.2.4. Aquifer Test of Well No. 8 (June 24, 2020)

The aquifer test of Well No. 8 (pumping well) was conducted on June 24, 2020 with Well No. 7 serving as the observation well approximately 605 feet away. A 3 HP submersible pump was set in the pumping well on 600 feet of 1 1/4-inch PVC column pipe. The pump was started at 12:06 P.M. on June 24, 2020; the water level was monitored for 24.20 hours of pumping and 94.08 hours of recovery. Prior to the pumping phase of the aquifer test, the static water level of the pumping well was measured at 458.6 ft. bgl (1,373.4 ft. MSL) and the static water level of the observation well was measured at 446.1 ft. bgl (1,374.9 ft. MSL).

Well No. 8 was pumped at an average rate of 11 gpm and the final measured pump rate was 11 gpm with 79.07 feet of drawdown, resulting in a specific capacity of 0.14 gpm/ft. When compared to the theoretical specific capacity (0.36 gpm/ft.), Well No. 8 produced at an efficiency of 39%. The Cooper-Jacob analysis resulted in a transmissivity of 103.7 ft^2/day, and a hydraulic conductivity of 0.55 ft./day. A maximum drawdown of 3.83 feet was observed in Well No. 7, indicating a slight hydraulic connection between the two wells. Due to the observed hydraulic connection, we calculated a storativity value of 4.7 x 10^{-5} for Well No. 7. Figure 16 provides a hydrograph of the pumping well and temperature over the duration of the aquifer test; Figure 17 provides a hydrograph of both the pumping and observation wells over the duration of the test.

Initially, the pumping level rapidly decreased in Well No. 8; however, approximately 120 minutes into the pumping phase, the water level began to stabilize between 535 and 537 ft. bgl (Figure 16). The observation well displayed a direct response to starting and stopping the pump in Well No. 8; however, the response was more muted when compared to the other wells in this study (Figure 17). After the pump was shut off, recovery was measured in both wells; the water level in the pumping well recovered 90% in approximately 20 minutes. There were no aquifer boundary conditions observed during the testing.

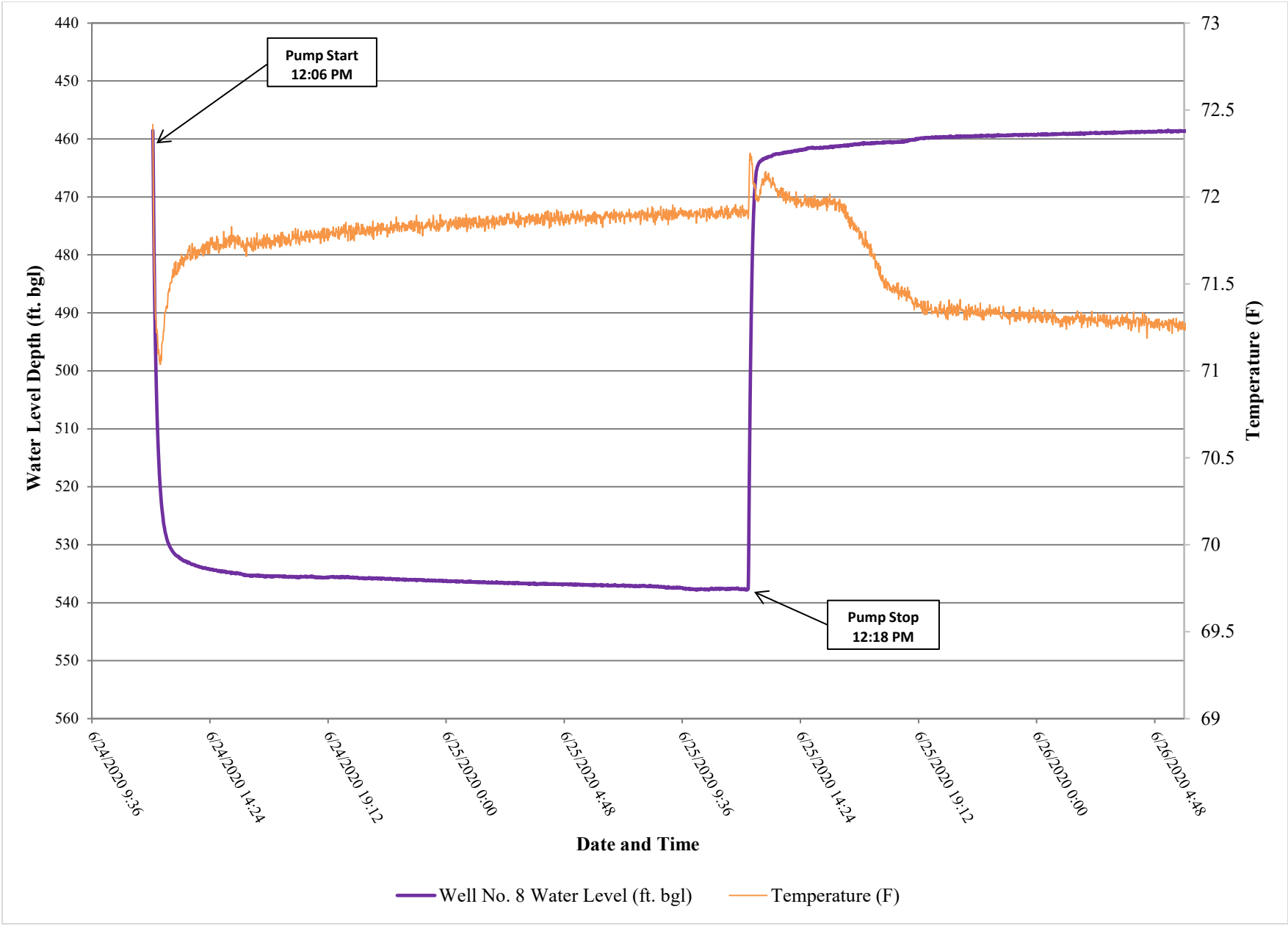


Figure 16: Aquifer test hydrograph of Well No. 8 (June 24, 2020)

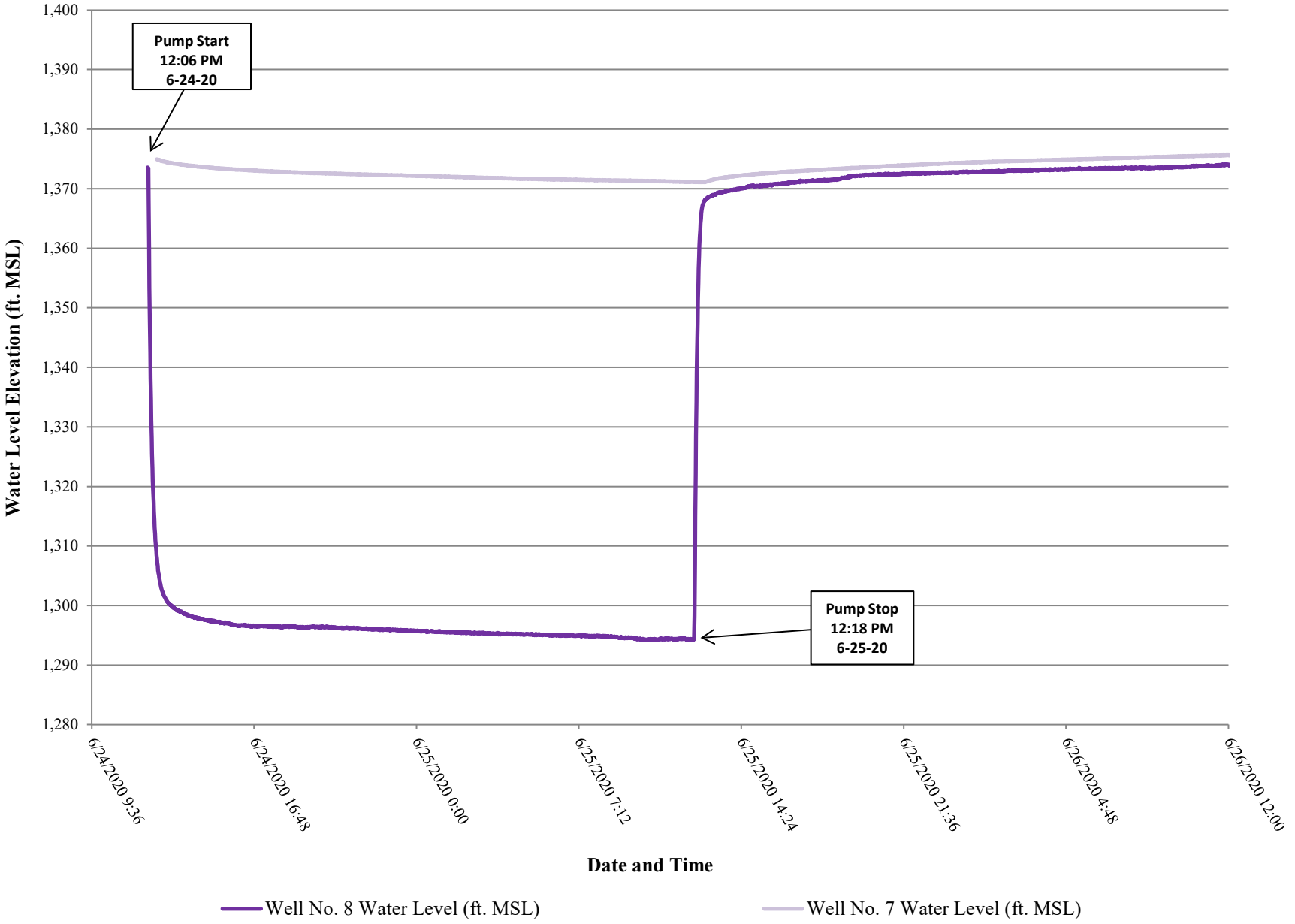


Figure 17: Aquifer test hydrograph of Well No. 8 and Observation Well No. 7 (June 24, 2020)

IV.2.5. Aquifer Test of Well No. 6 (June 29, 2020)

The aquifer test of Well No. 6 (pumping well) was conducted on June 29, 2020 with Well No. 7 serving as the observation well approximately 462 feet away. A 3 HP submersible pump was set in the pumping well on 600 feet of 1 1/4-inch PVC column pipe. The pump was started at 12:50 P.M. on June 29, 2020; the water level was monitored for 24.15 hours of pumping and 26.43 hours of recovery. Prior to the pumping phase of the aquifer test, the static water level of the pumping well was measured at 453.0 ft. bgl (1,377.0 ft. MSL) and the static water level of the observation well was measured at 447.6 ft. bgl (1,373.4 ft. MSL).

Well No. 6 was pumped at an average rate of 12 gpm and the final measured pump rate was 12 gpm with 6.85 feet of drawdown resulting in a specific capacity of 1.71 gpm/ft. When compared to the theoretical specific capacity (0.24 gpm/ft.), Well No. 6 produced at an efficiency of 712%. The Cooper-Jacob analysis resulted in a transmissivity of 67.3 ft^2/day, and a hydraulic conductivity of 0.35 ft./day. A maximum drawdown of 6.05 feet was observed in the observation well, indicating a hydraulic connection between the wells. Due to the observed hydraulic connection, we calculated a storativity value of 7.0 x 10^{-5} for Well No. 7. Figure 18 provides a hydrograph of the pumping well and temperature over the duration of the aquifer test; Figure 19 provides a hydrograph of both the pumping and observation well over the duration of the test.

During the pumping phase of the aquifer test, the water level in Well No. 6 slowly declined at a rate of approximately 0.1 to 0.2 feet per hour, reaching a stable pumping level near the end of the pumping phase (Figure 18). The water level in the observation well showed a noticeable response directly related to starting and stopping the pump in Well No. 6 (Figure 19). After the pump was shut off, recovery was measured in both wells; the water level in the pumping well recovered 77% in approximately 26 hours. There were no aquifer boundary conditions observed during the testing.

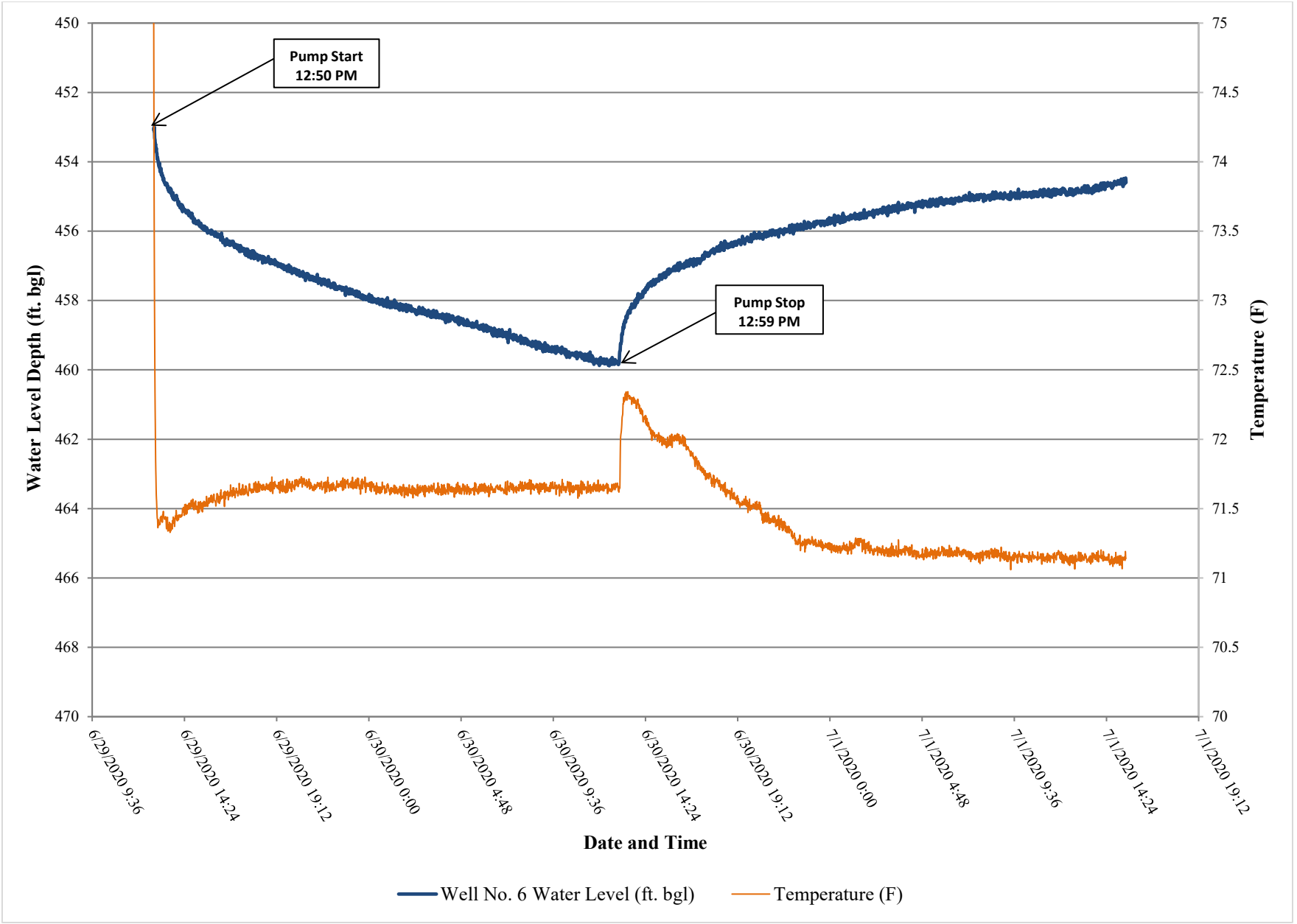


Figure 18: Aquifer test hydrograph of Well No. 6 (June 29, 2020)

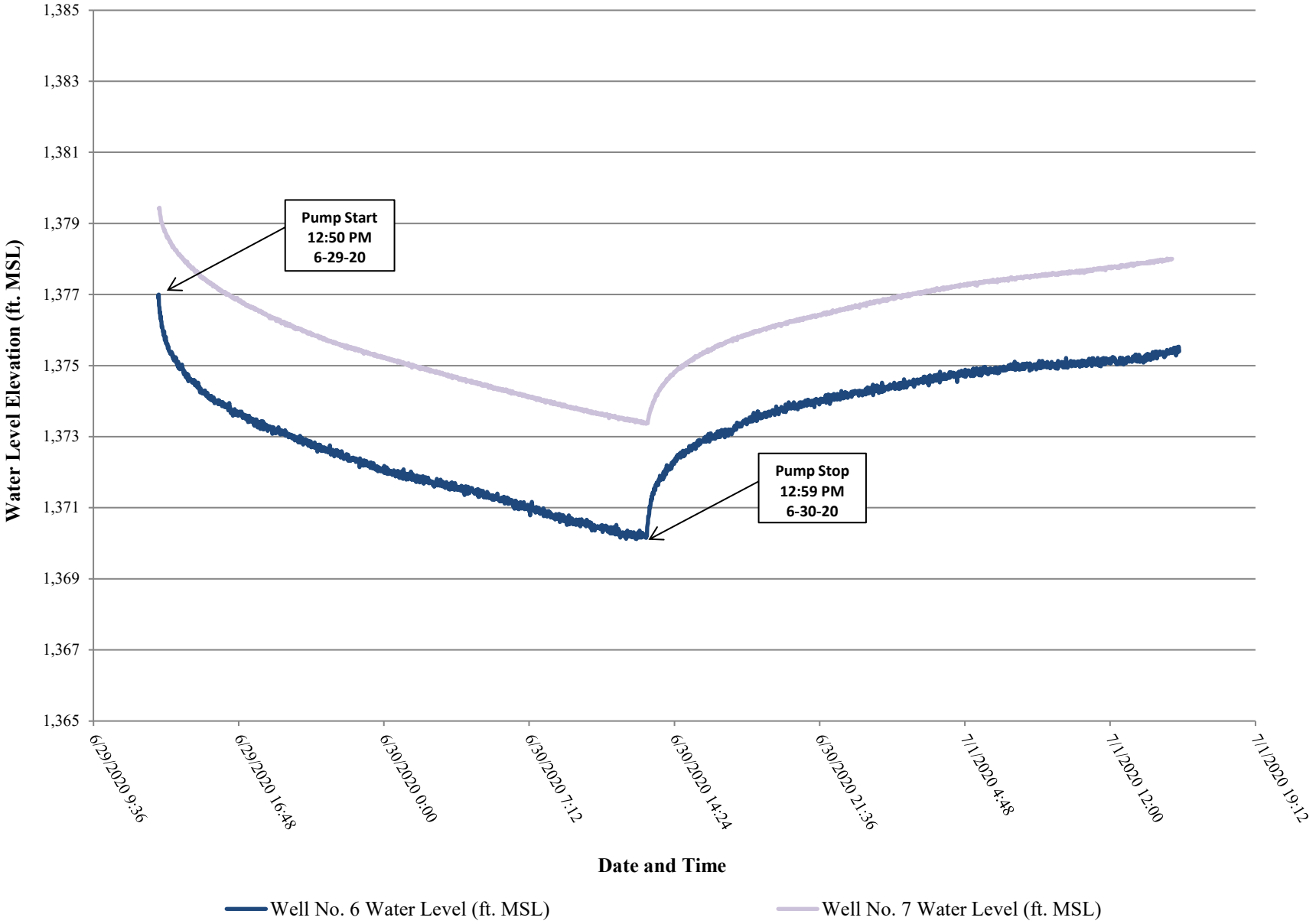


Figure 19: Aquifer test hydrograph of Well No. 6 and Observation Well No. 7 (June 29, 2020)

Table 2: 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
6/15/2020	PW No. 2	26	26	69.57	0.37	40.2	-	0.21	264%	190	No
	OW No. 1	-	-	23.11	-	43.2	2.2E-5	0.13	-	322	No
6/17/2020	PW No. 3	13	13	58.43	0.22	64.9	-	0.36	100%	182	No
	OW No. 4	-	-	58.05	-	15.36	1.6E-5	0.09	-	179	No
6/22/2020	PW No. 5	24	24	17.56	1.37	68.2	-	0.38	571%	179	Yes*
	OW No. 4	-	-	13.57	-	69.3	4.9E-5	0.39	-	179	No
6/24/2020	PW No. 8	11	11	79.07	0.14	103.7	-	0.55	39%	187	No
	OW No. 7	-	-	3.83	-	122.5	4.7E-5	0.68	-	179	No
6/29/2020	PW No. 6	12	12	6.85	1.71	67.3	-	0.35	712%	192	No
	OW No. 7	-	-	6.05	-	72.8	7.0E-05	0.41	-	179	No

Note: PW = Pumping Well; OW = Observation Well; ft. = feet; gpm = gallons per minute; d = day; *=Possible recharge/no-flow boundary condition observed.

IV.3. Water Quality

Water quality samples were collected from each pumping well at the end of the 24-hour pumping phase of each aquifer test. The samples were collected by Apex Drilling, Inc. staff in sealed containers and stored on ice in a cooler. The samples for each of the wells were transported to Aqua-Tech Laboratories, Inc. and were tested in accordance with Texas Administrative Code 230.9 (Determination of Groundwater Quality). Appendix F provides a copy of the water quality reports.

Table 3 provides the water quality summary of the samples. The results were compared to Texas Commission on Environmental Quality (TCEQ) Maximum Contaminant Levels (MCL) and Secondary Contaminant Levels (SCL). The results show all samples met the TCEQ MCLs. However, in all the sampled wells, the concentrations of fluoride, sulfate, and TDS exceeded the TCEQ SCLs (Table 3). In addition, Wells No. 2 and 8 exhibited elevated iron concentrations slightly above the TCEQ SCL. According to communications with Blanco-Pedernales GCD staff, the elevated sulfate and TDS concentrations observed in the wells are not uncommon for the area. Groundwater flowing through gypsum and anhydrite layers found within the aquifer account for the elevated sulfate and TDS. According to TWDB Report 174 "Ground-Water Resources of Blanco County, Texas," elevated levels of iron and fluoride are also not uncommon for the area (Folleet, 1973).

Concentrations above the TCEQ SCL standards are not considered health risks but may affect the taste and odor of the water. The variability in water chemistry is likely due to the karst nature of the aquifer where the fracture flow brings differing waters to each well. On-site treatment systems such as reverse osmosis have the capability of reducing constituents concentrations below TCEQ SCLs if desired by the homeowner however, treatment is not required.

Table 3: Summary of the water quality analysis results

Well	Sample Data	Cl	Conductivity (mhos/cm)	F	Fe	NO3	Mn	pH	SO4	Hardness (as CaCO3)	TDS	TC/E. coli
		TCEQ MCLs & SCLs										
		300[2]		4[1] & 2[2]	0.3[2]	1[1]	0.05[2]	6.5-8.5[2]	300[2]		1000[2]	Presence
2	6/16/2020	115	3.07	2.53	0.326	0.02	0.00885	7.2	999	1,300	2,390	Absent
3	6/18/2020	117	3.36	2.75	0.124	0.10	0.01190	7.1	1,550	1,470	2,670	Absent
5	6/23/2020	198	3.26	2.47	0.283	<0.02	0.00628	7.7	1,830	1,700	3,480	Absent
6	6/30/2020	196	4.08	2.39	0.092	0.03	0.01370	7.6	1,570	1,730	2,900	Absent
8	6/25/2020	85.3	3.25	2.34	0.307	<0.02	0.01020	7.5	1,350	1,470	2,600	Absent

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

IV.4. Groundwater Availability

Based upon the analysis of the aquifer tests, drawdown estimates were made at various distances from each pumping well after 10 years and 30 years. Figures 20 through 24 provide distance-drawdown plots for a single pumping well producing at a rate of 5 gpm for 1.17 hours a day (350 gallons per day). Figures 25 through 29 provide distance-drawdown plots for a single pumping well producing at a rate of 10 gpm for 0.58 hours a day (350 gallons per day). This represents the total water demand at full build out of the subdivision per housing unit (0.39 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 employs the following assumptions:

1. The water bearing formation is uniform in character and the hydraulic conductivity is the same in all directions;
2. The formation is uniform in thickness and infinite in areal extent;
3. The formation receives no recharge from any source;
4. The pumped well penetrates, and receives water from, the full thickness of the water bearing formation;
5. The water removed from storage is discharges 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 throughout 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 Middle Trinity Aquifer. These include assumptions 1, 3, 7 and 8. The Middle Trinity Aquifer is a karst aquifer and is fractured, not uniform or homogenous in character or in its hydrogeologic properties (transmissivity and storativity). In addition, 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 leads 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 overestimates drawdown within a well that is located in an aquifer that receives recharge rapidly. For this reason, using the Theis equation to calculate drawdown over periods of time greater than when water from capture exceeds water from storage leads to an exaggerated estimate of drawdown.

Tables 4 and 5 provide a summary of the results from the distance-drawdown calculations. Estimates of drawdown are based on the following assumptions:

- Total daily water demand (entire subdivision) = 32.15 acre-feet/year
- Total daily water demand (per housing unit) = 0.39 acre-feet/year = 350 gpd;
- All individual wells can be pumped at a rate of 5 gpm for 1.17 hours per day (Table 4), or pumped at 10 gpm for 0.58 hours per day (Table 5);
- A transmissivity value and a storativity value taken from each individual aquifer test.

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. 5 gpm Production

Based upon the average drawdown calculated from the distance-drawdown projections, the drawdown after 10 years of production at 5 gpm and a well spacing of 100 feet results in an average of 4.3 feet. At a spacing of 250 feet, the well interference reduces to an average of 2.3 feet. At a spacing of 500 feet, the well interference reduces further to an average of 1.1 feet.

Based upon the average drawdown calculated from the distance-drawdown projections, the drawdown after 30 years of production at 5 gpm and a well spacing of 100 feet results in an average of 4.4 feet. At a spacing of 250 feet, the well interference reduces to an average of 2.4 feet. At a spacing of 500 feet, the well interference reduces further to an average of 1.2 feet.

IV.4.2. 10 gpm Production

Based upon the average drawdown calculated from the distance-drawdown projections, the drawdown after 10 years of production at 10 gpm and a well spacing of 100 feet results in an average of 6.5 feet. At a spacing of 250 feet, the well interference reduces to an average of 2.7 feet. At a spacing of 500 feet, the well interference reduces further to an average of 1.1 feet.

Based upon the average drawdown calculated from the distance-drawdown projections, the drawdown after 30 years of production at 10 gpm and a well spacing of 100 feet results in an average of 6.5 feet. At a spacing of 250 feet, the well interference reduces to an average of 2.7 feet. At a spacing of 500 feet, the well interference reduces further to an average of 1.1 feet.

Due to the limited well interference calculated, we recommend that the Red Oak Mountain Subdivision wells be spaced a minimum distance of 250 feet for wells pumped at rates up to 10 gpm. 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 4: Summary of distance-drawdown calculations (5 gpm)

	Drawdown at Pumped Well After 10-Years of Pumping	Drawdown at Pumped Well After 30-Years of Pumping	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	Dist. to Outer Edges of Cone of Depression - 30 years
Well	**(ft)**	**(ft)**	**Property Boundary Distance (ft)**	**Drawdown (ft)**	**Property Boundary Distance (ft)**	**Drawdown (ft)**	**(feet)**	**(feet)**
No. 2	29.6	29.7	271	3.5	271	3.6	500	500
No. 3	19.2	19.3	759	1.3	759	1.4	500	500
No. 5	17.1	17.2	885	0.6	885	0.7	500	500
No. 6	17.0	17.0	1,330	0.5	1,330	0.6	500	500
No. 8	11.6	11.7	1,055	0.5	1,055	0.6	500	500

Table 5: Summary of distance-drawdown calculations (10 gpm)

	Drawdown at Pumped Well After 10-Years of Pumping	Drawdown at Pumped Well After 30-Years of Pumping	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	Dist. to Outer Edges of Cone of Depression - 30 years
Well	**(ft)**	**(ft)**	**Property Boundary Distance (ft)**	**Drawdown (ft)**	**Property Boundary Distance (ft)**	**Drawdown (ft)**	**(feet)**	**(feet)**
No. 2	55.6	55.7	271	18.7	271	18.7	500	500
No. 3	36.2	36.3	759	1.4	759	1.5	500	500
No. 5	32.1	32.2	885	0.6	885	0.7	500	500
No. 6	31.7	31.8	1,330	0.5	1,330	0.6	500	500
No. 8	21.8	21.9	1,055	0.3	1,055	0.4	500	500

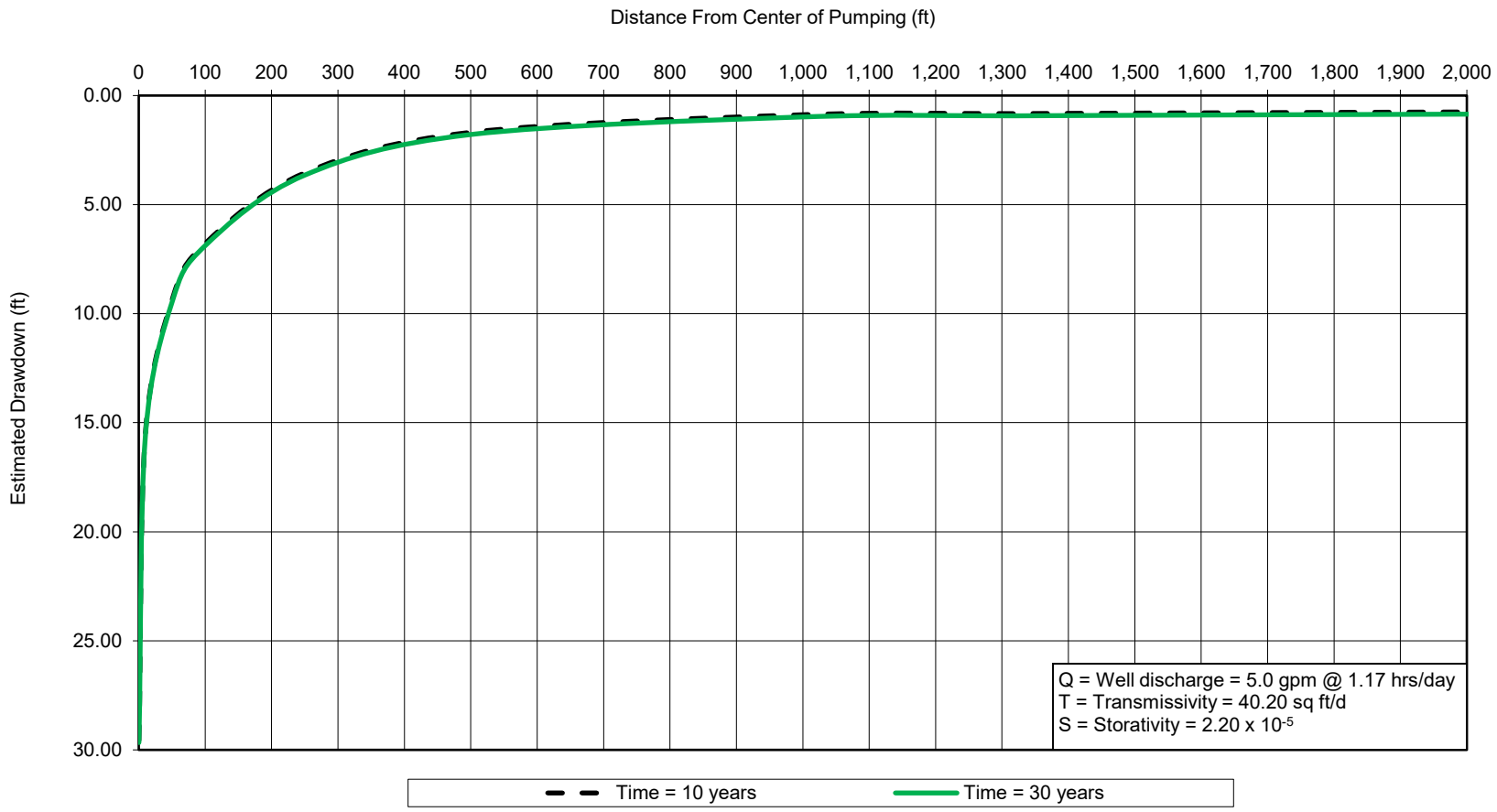


Figure 20: Distance drawdown plot for Well No. 2 (5 gpm)

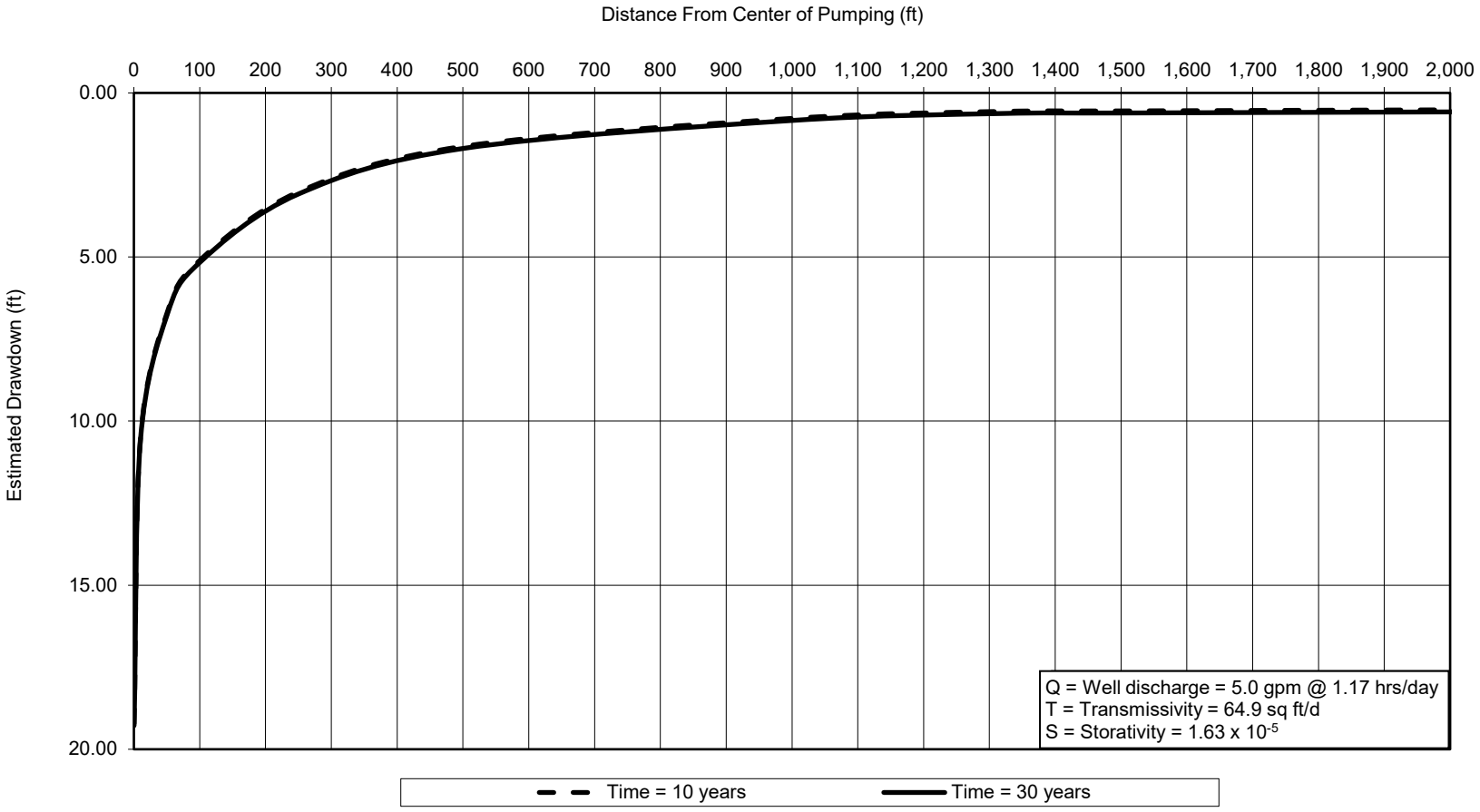


Figure 21: Distance drawdown plot for Well No. 3 (5 gpm)

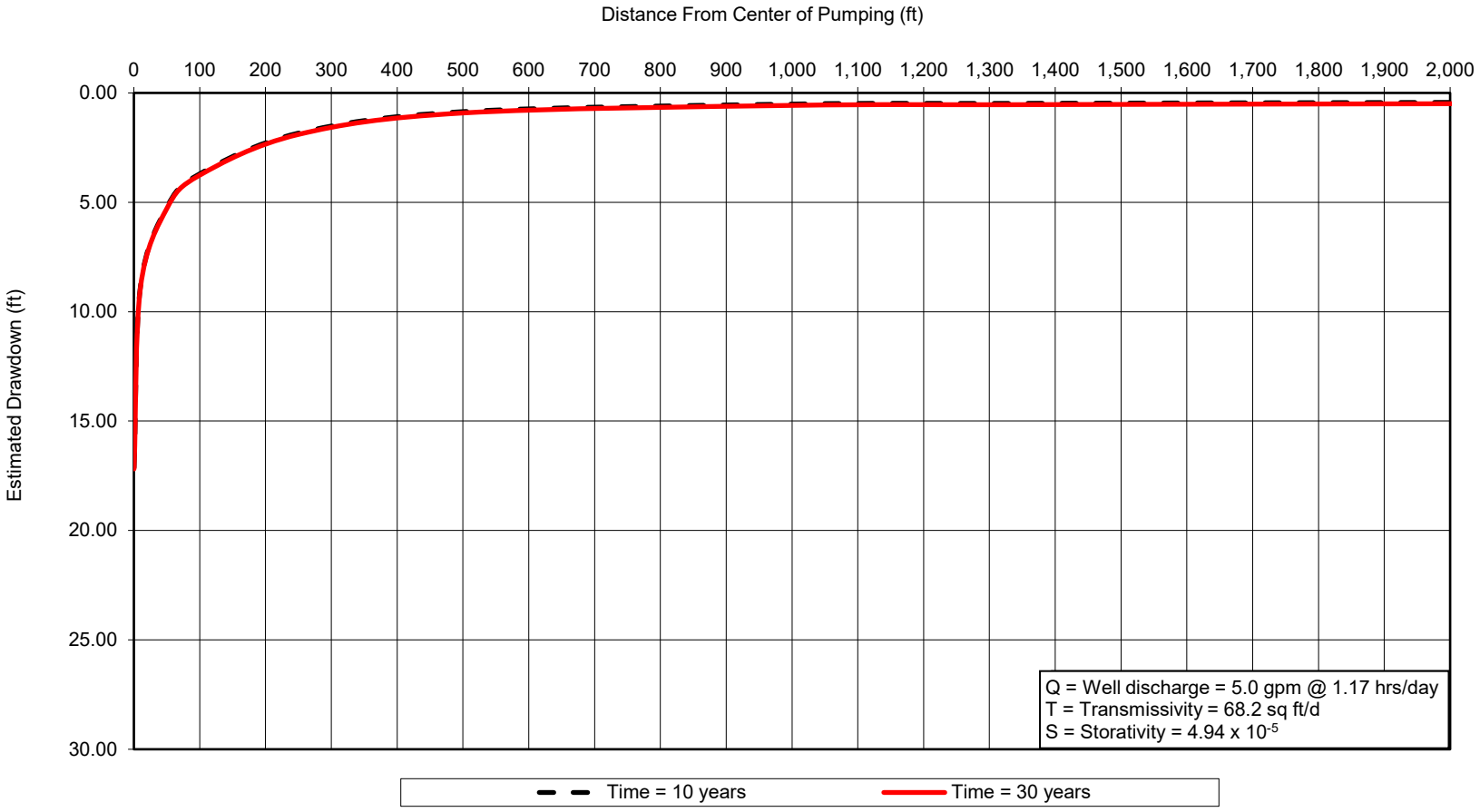


Figure 22: Distance drawdown plot for Well No. 5 (5 gpm)

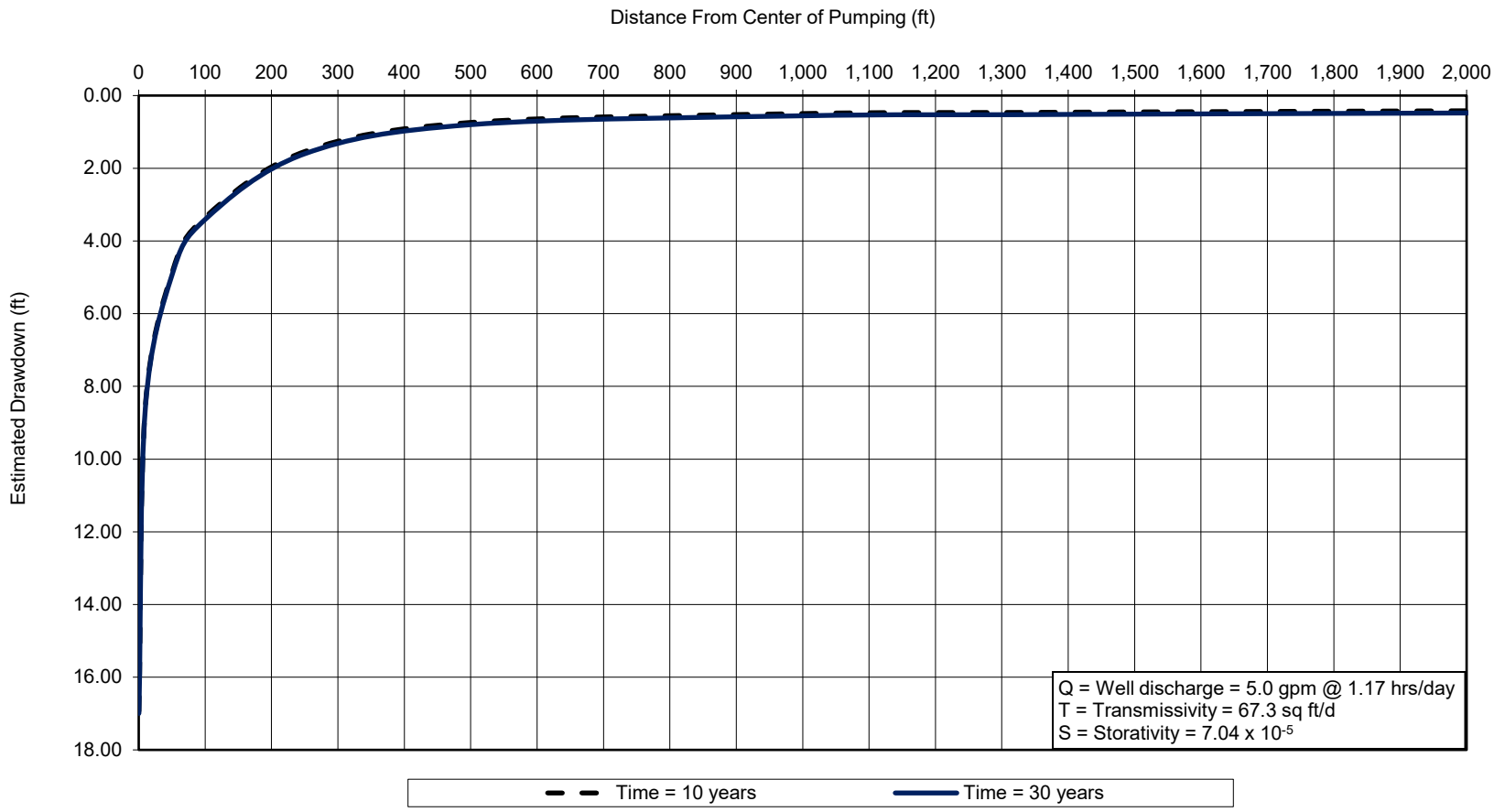


Figure 23: Distance drawdown plot for Well No. 6 (5 gpm)

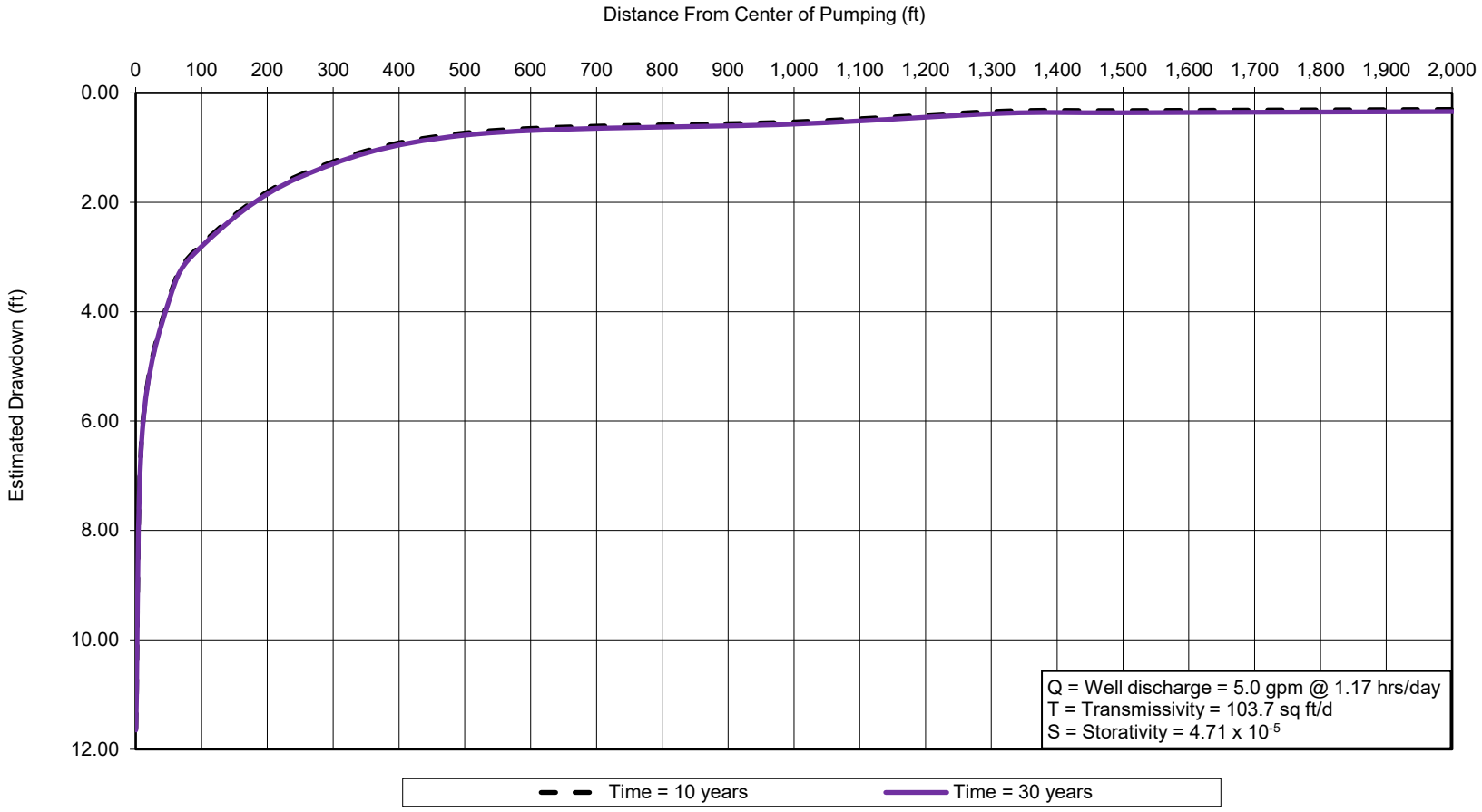


Figure 24: Distance drawdown plot for Well No. 8 (5 gpm)

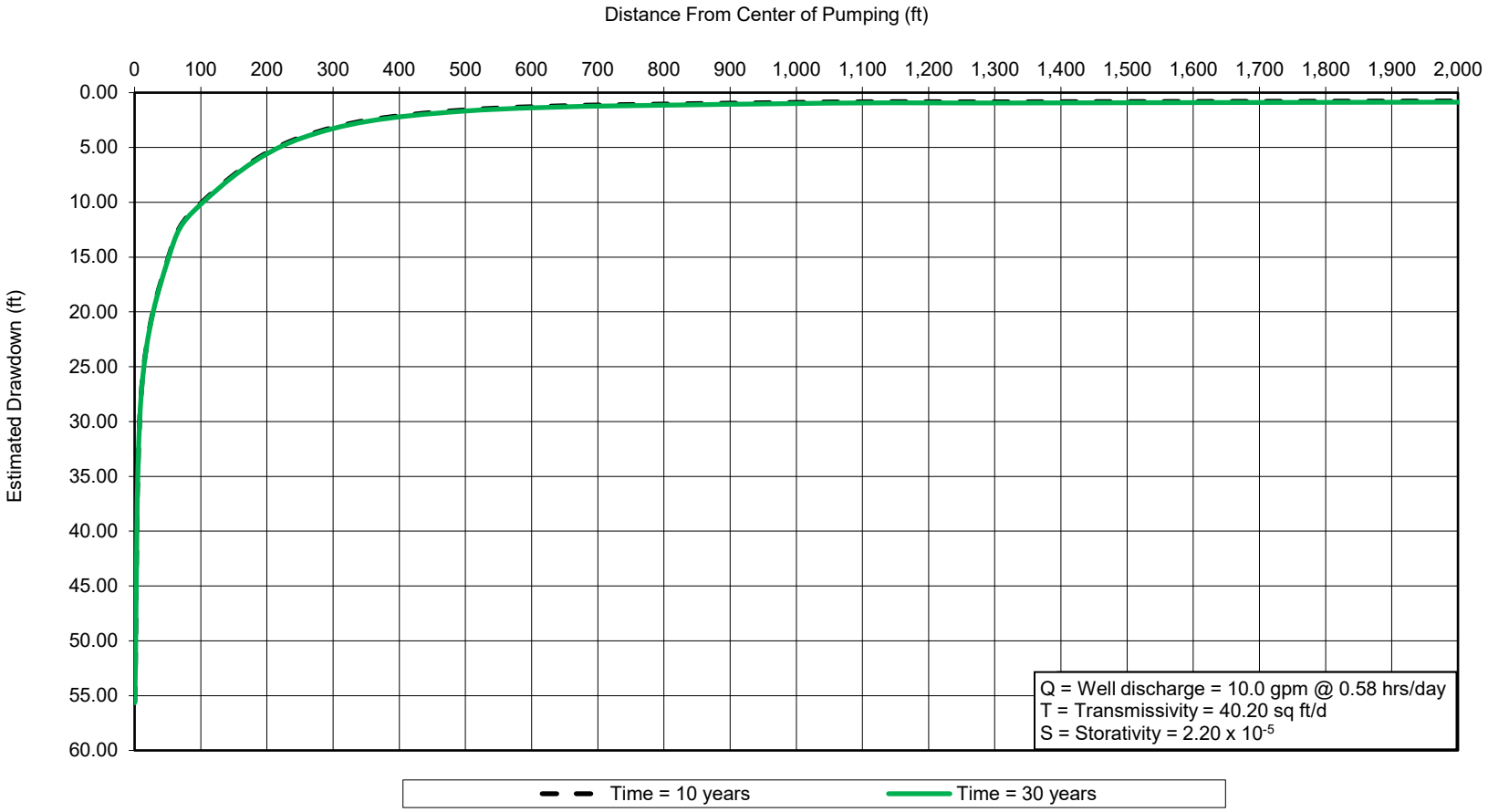


Figure 25: Distance drawdown plot for Well No. 2 (10 gpm)

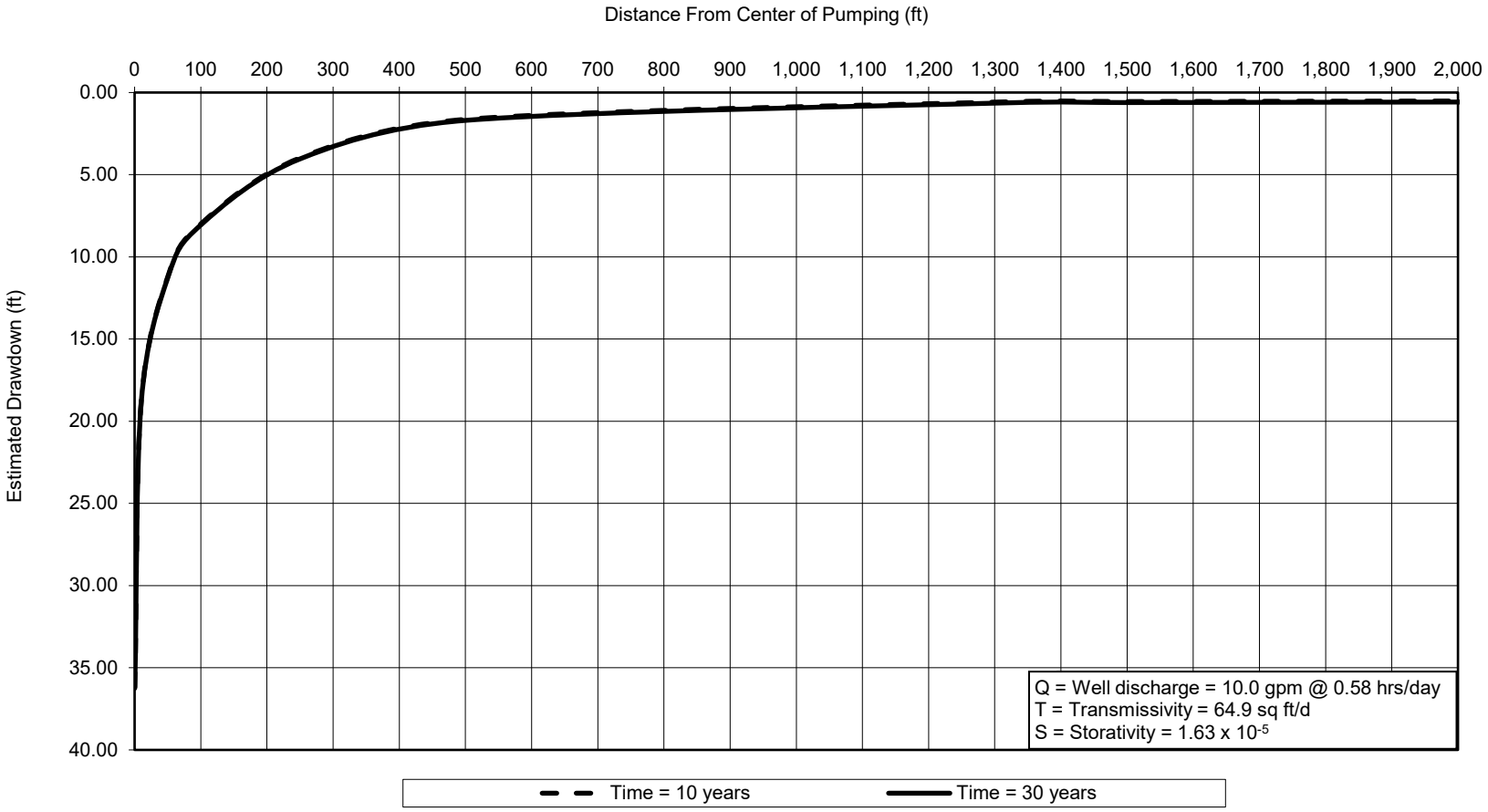


Figure 26: Distance drawdown plot for Well No. 3 (10 gpm)

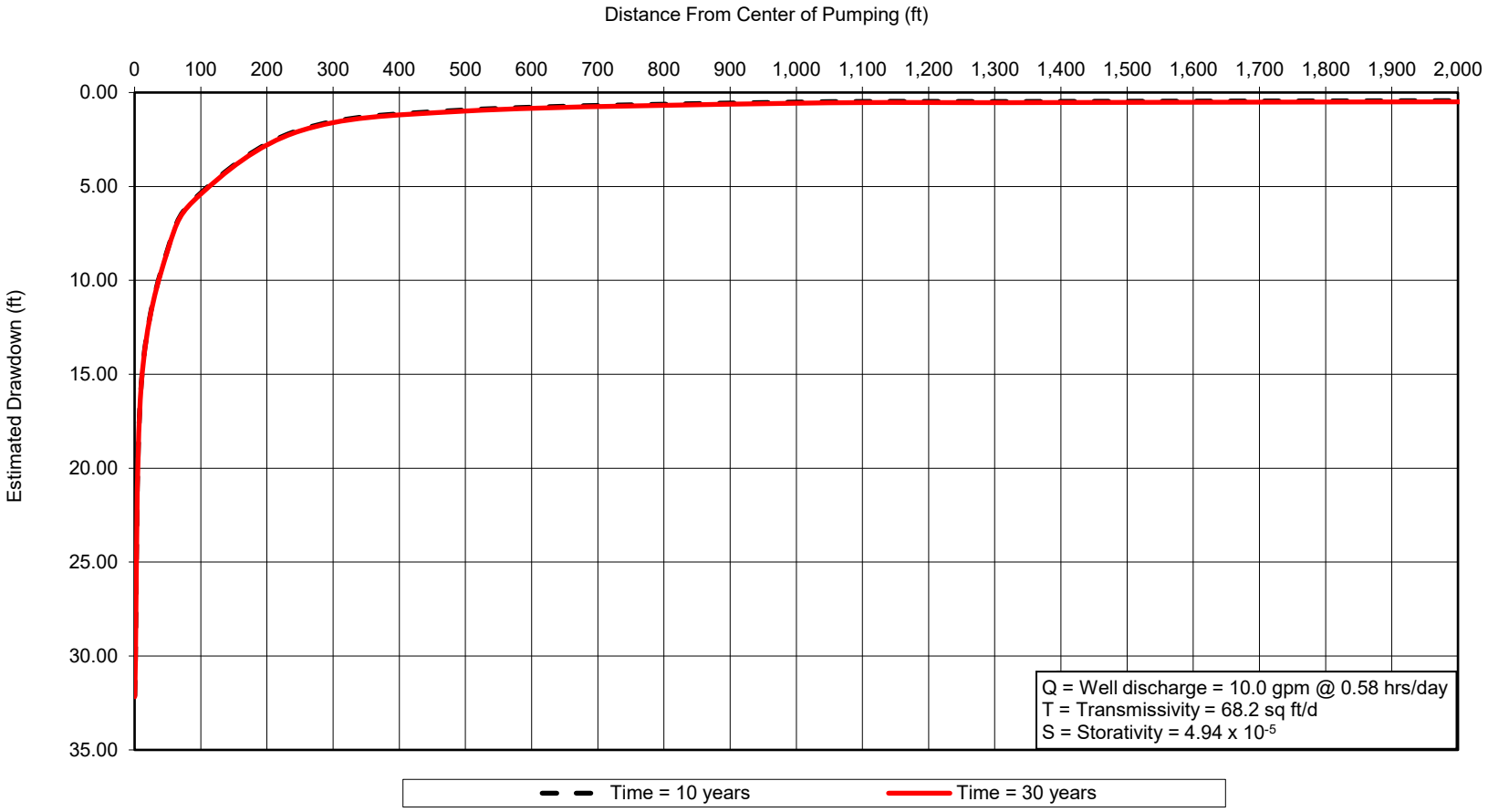


Figure 27: Distance drawdown plot for Well No. 5 (10 gpm)

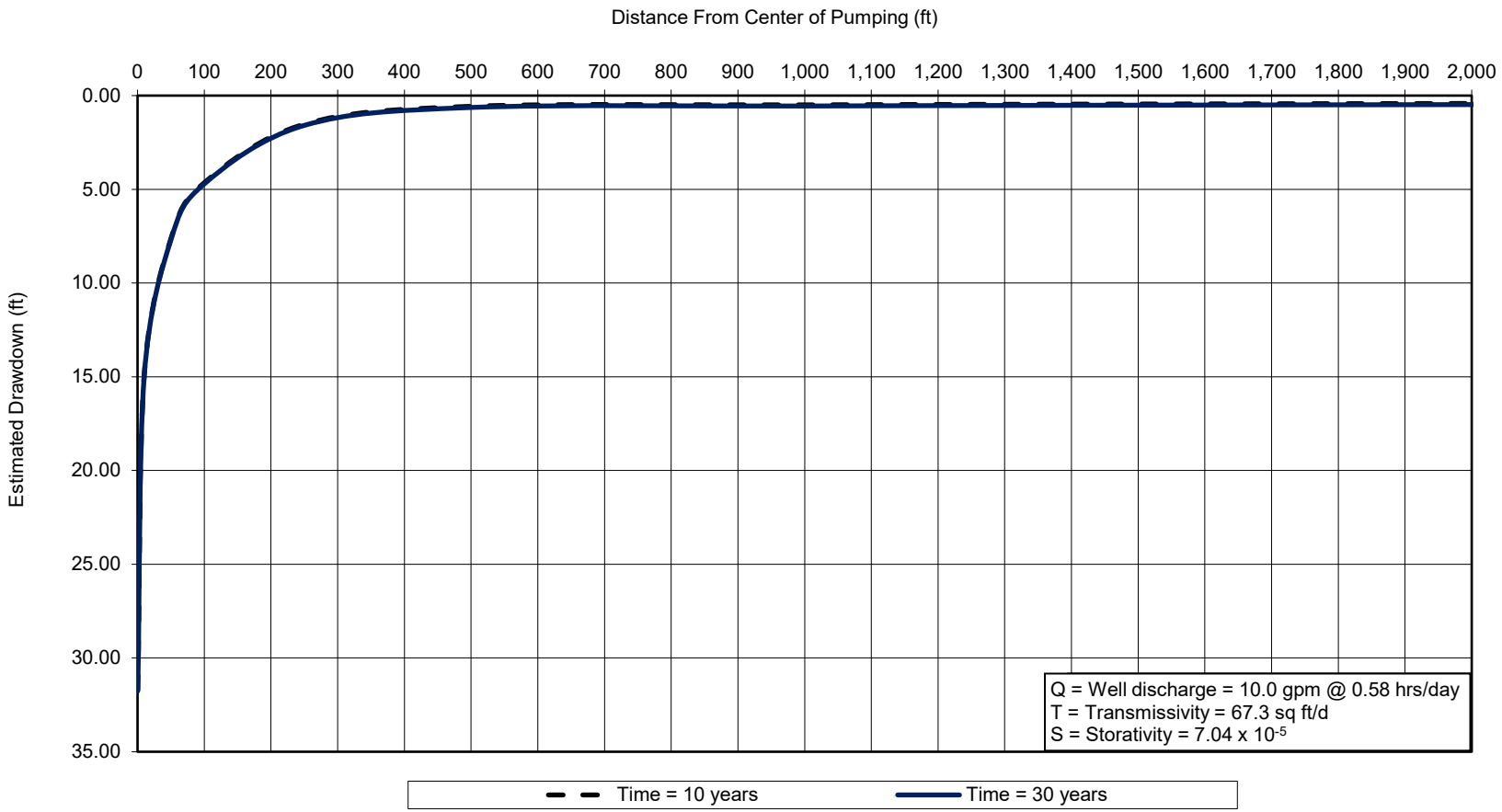


Figure 28: Distance drawdown plot for Well No. 6 (10 gpm)

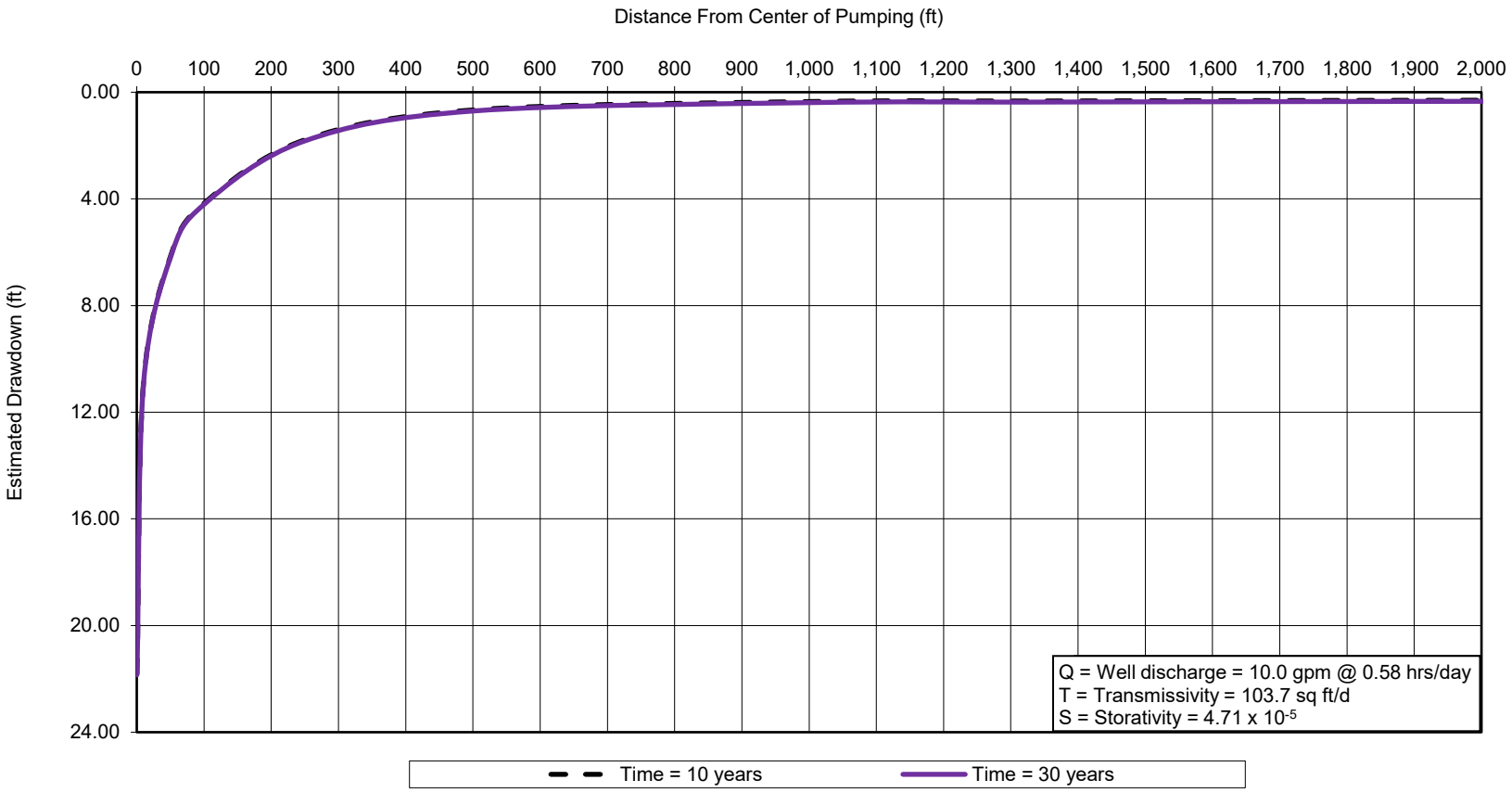


Figure 29: Distance drawdown plot for Well No. 8 (10 gpm)

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 Middle Trinity Aquifer in Blanco 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 to the base of the Cow Creek Limestone within the Middle Trinity Aquifer to provide the maximum possible yield and set their pumps as deep as practically possible to protect from declining water levels during drought. On-site treatment systems such as reverse osmosis and/or water softeners may be installed by the home owner to reduce concentrations of dissolved minerals.

Section VI: References

Ashworth, J. B., 1983, Ground-water availability of the Lower Cretaceous formations in the Hill Country of south-central Texas: Texas Department of Water Resources Report 273,173 p.

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Barnes, V. E., and Bell, W. C., 1977. The Moore Hollow Group of Central Texas: The University of Texas at Austin, Bureau of Economic Geology, Report of Investigations No, 88, 169 p.

Bredehoeft, J.D., and T.J. Durbin. 2009. Ground water development—The time to full capture problem. Ground Water 47, no. 4: 506–514. DOI:10.1111/j.1745-6584.2008. 00538.x

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Folleet, C.R., 1973. Ground-Water Resources of Blanco County, Texas: Texas Department of Water Resources Report 174.

Konikow L.F. and Leake S.A., 2014, Depletion and Capture: Revisiting ‘‘The Source of Water Derived from Wells’’, Vol. 52, Groundwater–Focus Issue 2014, p. 100–111.

McGeehee, R.V., 1979. Precambrian Rocks of the Southeastern Llano Region, Texas. Texas Bureau of Economic Geology, Geological Circular 79-3, 36 p.

Preston, R.D., Pavilcek, D.J., Bluntzer, R.L., and Derton, J., 1996. The Paleozoic and Related Aquifers of Central Texas. TWDB Report 346, 77 p.

Standen, A. and Ruggiero, R., 2007. Llano Uplift Aquifers Structure and Stratigraphy. Prepared for Texas Water Development Board Contract Number 0604830614. 28 p.

Theis, C.V. 1940. The source of water derived from wells—Essential factors controlling the response of an aquifer to development. Civil Engineering 10: 277–280.

Walton, W.C. 2011. Aquifer system response time and groundwater supply management. Ground Water 49, no. 2: 126–127.

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 §212.0101, Texas Local Government Code or a county authority pursuant to §232.0031, 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, Texas Administrative Code, 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 §§212.004 and 232.001, Texas Local Government Code. 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 §35.019 or Chapter 36 of the Texas Water Code.

Administrative Information (30 TAC, §230.4).

1. Name of Proposed Subdivision: Red Oak Mountain Subdivision
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, TX 78654
   Phone: 800-511-2430
   Fax: _____
4. Plat Applicant's Name: Lone Star Land Partners, LLC
   Address: P.O. Box 1987 Marble Falls, TX 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, TX 78734
   Phone: 512-773-3226
   Fax: _____
   Certificate Number: TBPG License No: 1126
6. Location and Property Description of Proposed Subdivision: ~9 miles west from the city of Blanco, TX on Maenius Road.
7. Tax Assessor Parcel Number(s).
   Book: _____
   Map: _____
   Parcel: Blanco County: 83463

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): 492.66
10. Number of Proposed Lots: 82
11. Average Size of Proposed Lots (acres): 6.01
12. Anticipated Method of Water Distribution.
    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 ½-mile radius should be attached to this form (30 TAC §230.5(f)).

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): 82 single family housing units

Average Number of Persons per Housing Unit: 3.5 persons

Gallons of Water Required per Person per Day: 100 gallons per capita per day (gpcd)

Water Demand per Housing Unit per year (acre feet/year): 0.39 acre-ft (assuming 135 gpcd)

Total Expected Residential Water Demand per Year (acre feet/year): 32.15 acre-ft

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): 32.15

16. Total Water Demand Estimate at Full Build Out (acre feet/year): 32.15 acre-ft

17. Sources of Information Used for Demand Estimates: Blanco-Pedernales 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:

Note: Users may refer to Aquifers of Texas *(Texas Water Development Board Report 345, 1995) to obtain general information pertaining to the state's aquifers. This reference is available via the Internet (www.twdb.state.tx.us).* Trinity Aquifer

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)? Yes No

20. Were the geologic and groundwater resource factors identified under §230.7(b) considered in planning and designing the aquifer test required under §230.8(c)? 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 though 4)? 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))? Yes No

23. Has an aquifer test been conducted which meets the requirements of §§230.8(c)(1 and 6)? 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)? 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 (related 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).

Determination of Groundwater Quality (30 TAC, §230.9).

27. Have water quality samples been collected as required by §230.9? Yes No

28. Has a water quality analysis been performed which meets the requirements of §230.9? Yes No

Determination of Groundwater Availability (30 TAC, §230.10).

29. Have the aquifer parameters required by §230.10(c) been determined? Yes No

30. If so, provide the aquifer parameters as determined.

Rate of yield and drawdown: **(See attached Tables 1 and 2)**

Specific capacity: **(See attached Table 2 & Appendix D)**

Efficiency of the pumped well: **(See attached Table 2 & Appendix D)**

Transmissivity: **(See attached Table 2 & Appendix D)**

Coefficient of storage: **(See attached Table 2)**

Hydraulic conductivity: **(See attached Table 2 & Appendix D)**

Were any recharge or barrier boundaries detected? Yes No

If yes, please describe:

Thickness of aquifer(s): **(See attached Table 2 & Appendix C)**

31. Have time-drawdown determinations been calculated as required under §230.10(d)(1) Yes No

32. Have distance-drawdown determinations been calculated as required under §230.10(d)(2)? Yes No

33. Have well interference determinations been made as required under §230.10(d)(3)? 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 been compared to primary and secondary public drinking water standards as required under §230.10(e)? Yes No

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: **See Section IV.3**

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 Table 4 & 5**

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 Table 4 & 5**

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 Table 4 & 5**

39. The recommended minimum spacing limit between wells is 250 feet with a recommended well yield of 5-10 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 Appendices.

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 judgement, 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.

Date: 7/27/2020 (affix seal)

Appendix B

Geophysical Logs

Geophysical Log

Well No. 1

Blanco-Pedernales Groundwater Conservation District

Borehole Name or #: **Red Oak Mountain Well #1**

Logs: **GR RES**

Logging Dates: **6/30/2020**

601 West Main, P. O. Box 1516, Johnson City, TX 78636 - - - (830) 868-9196 - - - manager@blancocountygroundwater.org

Well Owner: **Red Oak Mountain LLC**

Well Regist. #: **20190113**

Latitude: **30* 08' 00.2"** Longitude: **98* 33' 47.3**

Blanco County, Texas

Elevation MSL: **Topo: 1661** **GPS:** **Google Earth:**

GPS Datum: **NAD 27**

Borehole Data

Drilling Contractor: **Apex Drilling**

Date Drilled: **11/4/2019**

Measuring Point: **2.5** **Feet Above Ground Level**

Driller TD: **605**

Depth Reference: **Ground Level**

Logger TD: **572.5**

Water Level: **288.3** **Feet Below Measuring Point**

Bit Record				Casing Record			
Run	Bit Size	From	To	PVC / Steel	Size	From	To
1	8	0	50	PVC	4.5	2.5	605
2	6.25	50	605				
3							

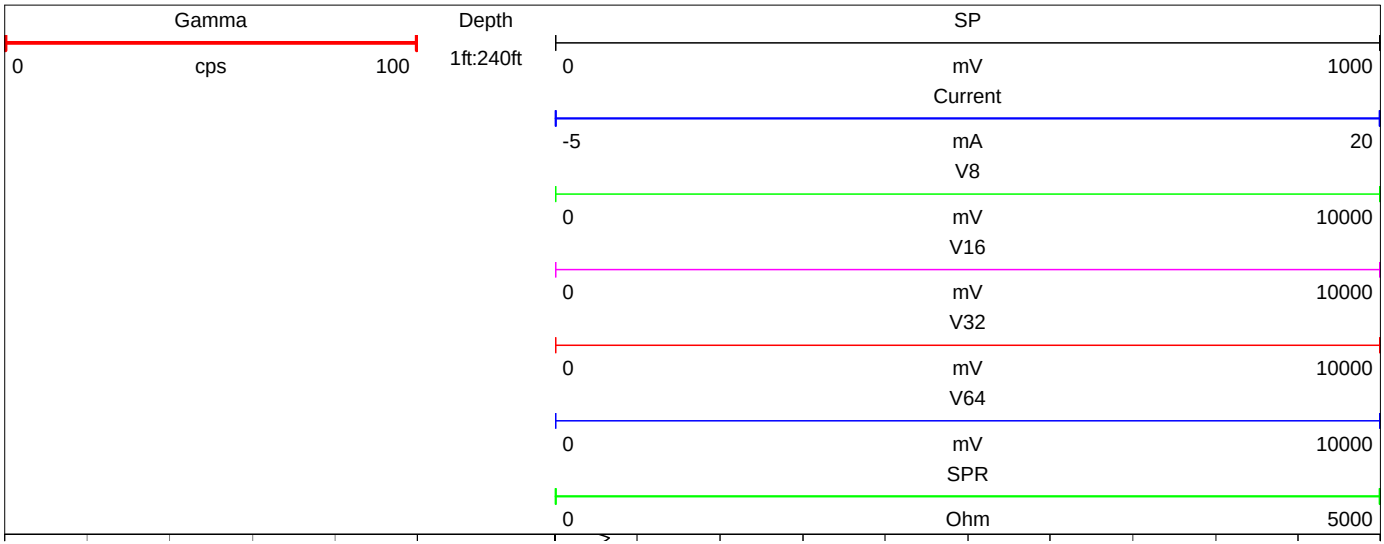
Logging Data

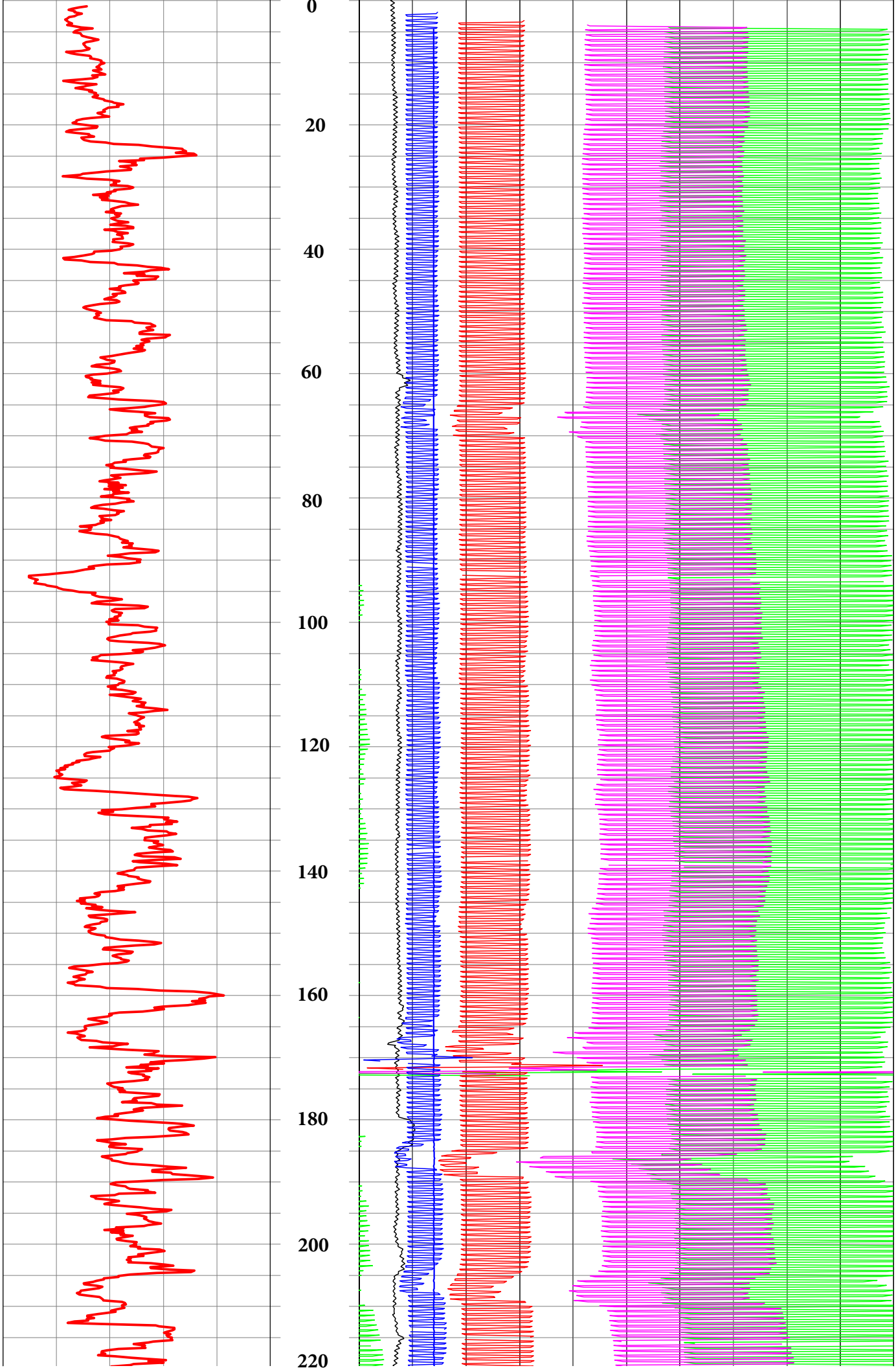
Logged By: **R. Fieseler, A. Balzen**

Witness: **None**

Log Type	Run #	Up / Down	From	To	Feet / Min.
GR RES	1	Up	572	0	15
	2				15
	3				
	4				

Comments:

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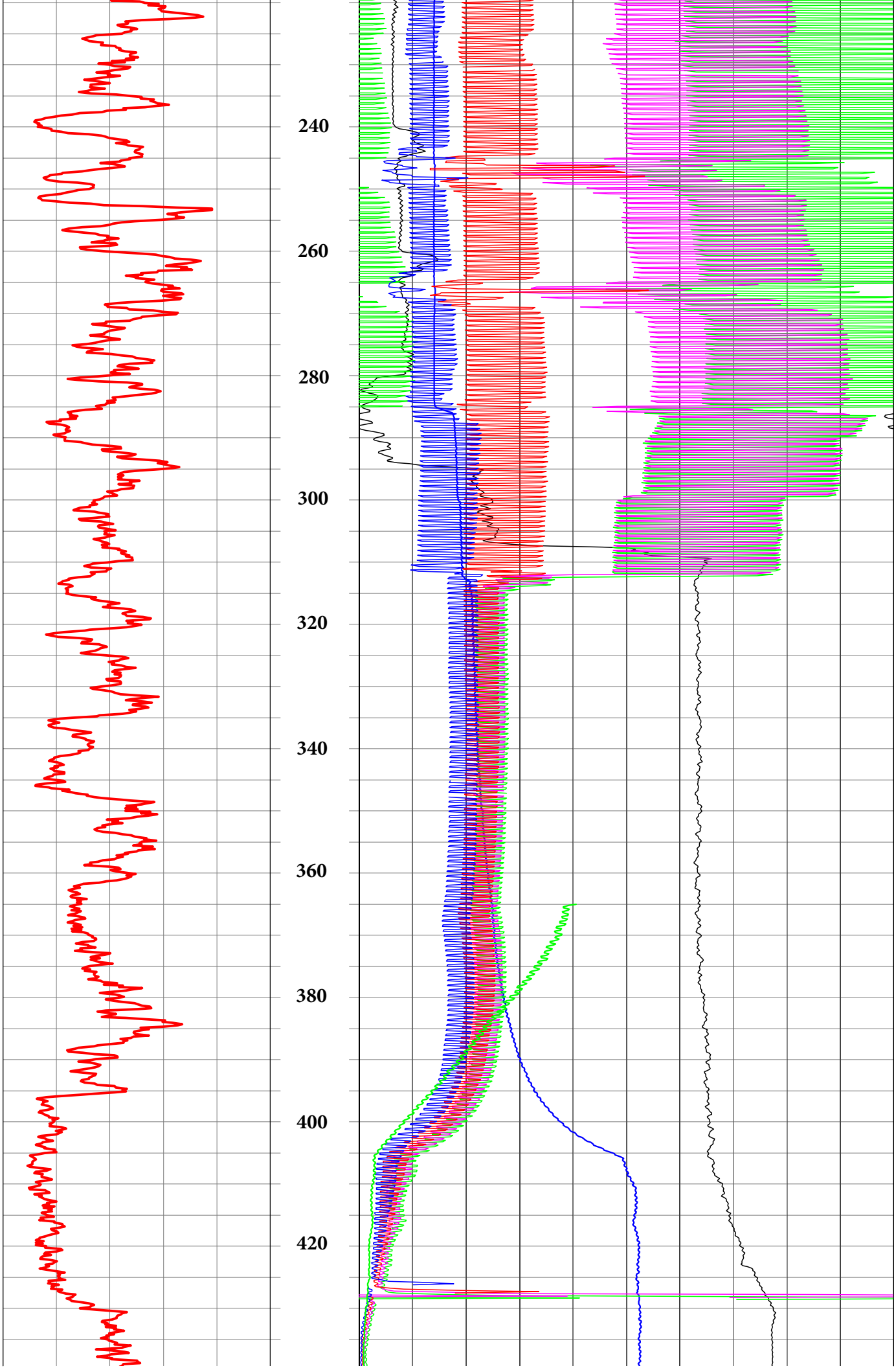
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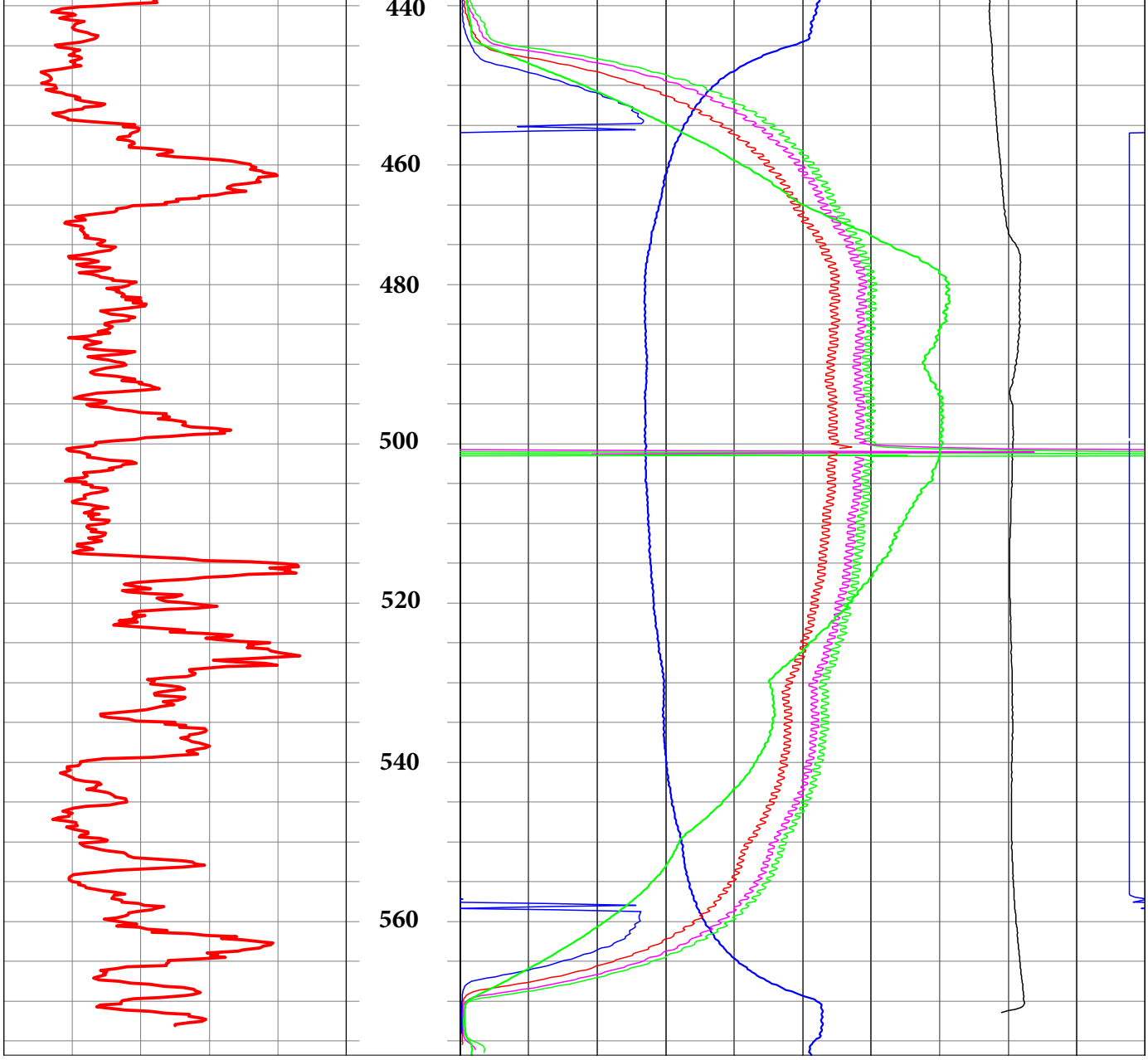
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560

Geophysical Log

Well No. 2

Blanco-Pedernales Groundwater Conservation District

Borehole Name or #: **Red Oak Mountain Well #2**

Logs: **GR RES**

Logging Dates: **6/30/2020**

601 West Main, P. O. Box 1516, Johnson City, TX 78636 - - - (830) 868-9196 - - - manager@blancocountygroundwater.org

Well Owner: **Red Oak Mountain LLC** Well Regist. #: **20190114**

Latitude: **30* 07' 59.9"** Longitude: **98* 33' 54.6"** Blanco County, Texas

Elevation MSL: **Topo: 1650** **GPS:** **Google Earth:** GPS Datum: **NAD 27**

Borehole Data

Drilling Contractor: **Apex Drilling** Date Drilled: **11/5/2019**

Measuring Point: **1.5** **Feet Above Ground Level** Driller TD: **460**

Depth Reference: **Ground Level** Logger TD: **452**

Water Level: **274.5** **Feet Below Measuring Point**

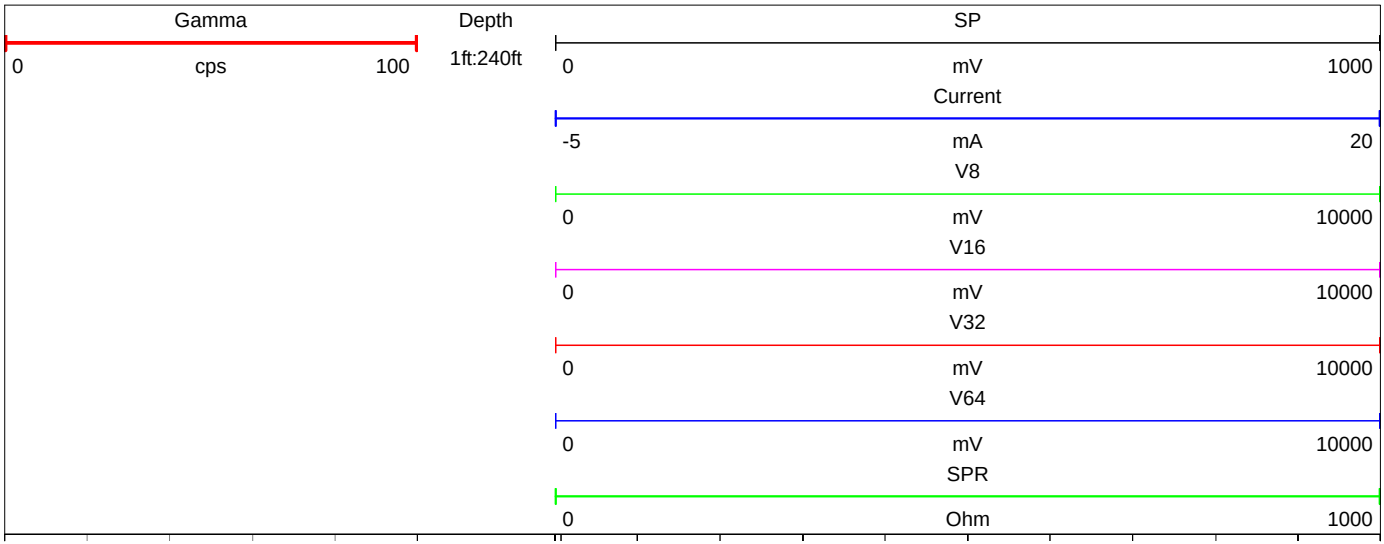
Bit Record				Casing Record			
Run	Bit Size	From	To	PVC / Steel	Size	From	To
1	8	0	50	PVC	4.5	+1.7	460
2	6.25	50	460				
3							

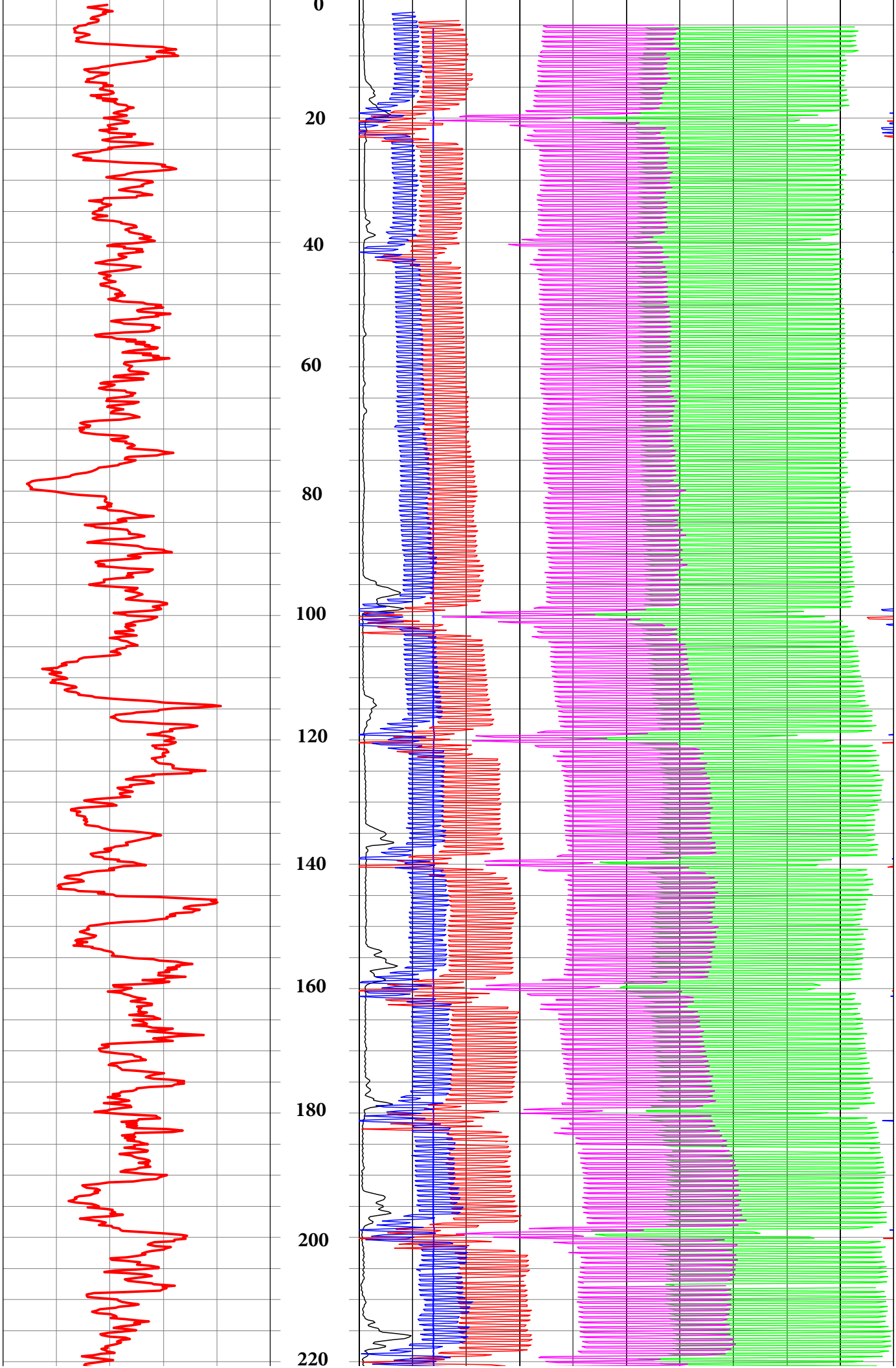
Logging Data

Logged By: **R. Fieseler, A. Balzen** Witness: **None**

Log Type	Run #	Up / Down	From	To	Feet / Min.
GR RES	1	Up	452	0	15
	2				15
	3				
	4				

Comments:

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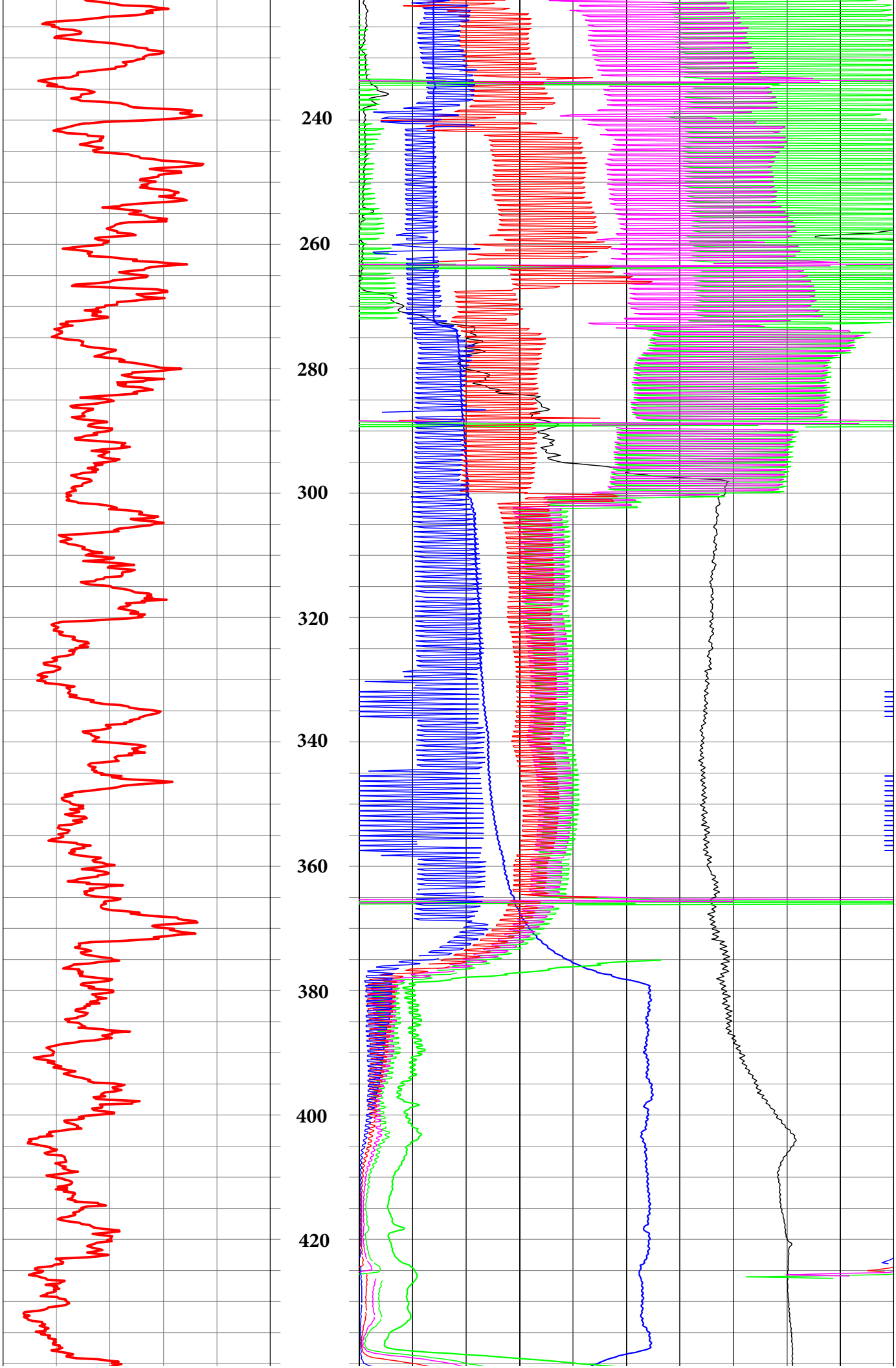
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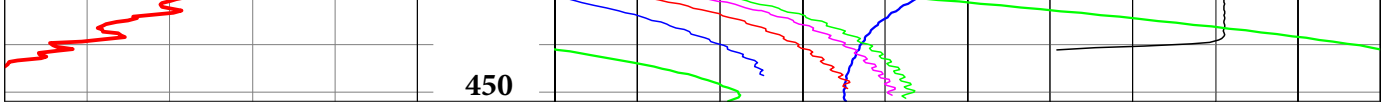
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Geophysical Log

Well No. 4

Blanco-Pedernales Groundwater Conservation District

Borehole Name or #: **Red Oak Mountain Well #4**

Logs: **GR RES**

Logging Dates: **6/30/2020**

601 West Main, P. O. Box 1516, Johnson City, TX 78636 - - - (830) 868-9196 - - - manager@blancocountygroundwater.org

Well Owner: **Red Oak Mountain LLC** Well Regist. #: **20200078**

Latitude: **30* 08' 00.7"** Longitude: **98* 33' 22.6"** Blanco County, Texas

Elevation MSL: **Topo: 1735** **GPS:** **Google Earth:** GPS Datum: **NAD 27**

Borehole Data

Drilling Contractor: **Apex Drilling** Date Drilled: **6/11/2020**

Measuring Point: **2.0** **Feet Above Ground Level** Driller TD: **545**

Depth Reference: **Ground Level** Logger TD: **541.5**

Water Level: **367.2** **Feet Below Measuring Point**

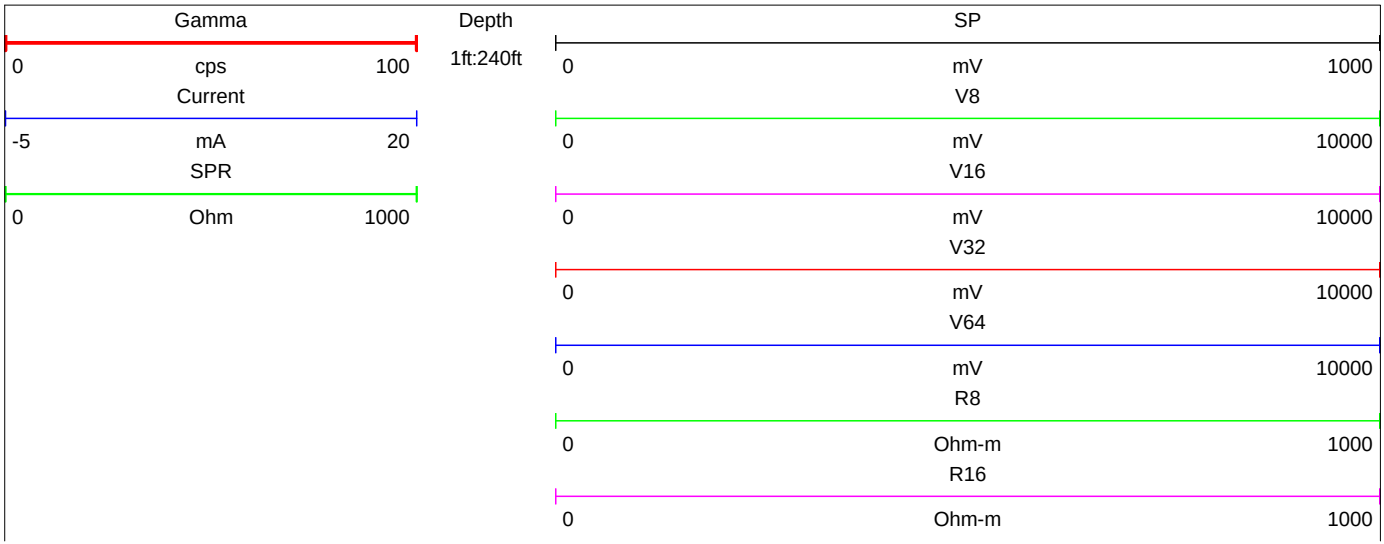
Bit Record				Casing Record			
Run	Bit Size	From	To	PVC / Steel	Size	From	To
1	8	0	50	PVC	4.5	+1.7	545
2	6.25	50	545				
3							

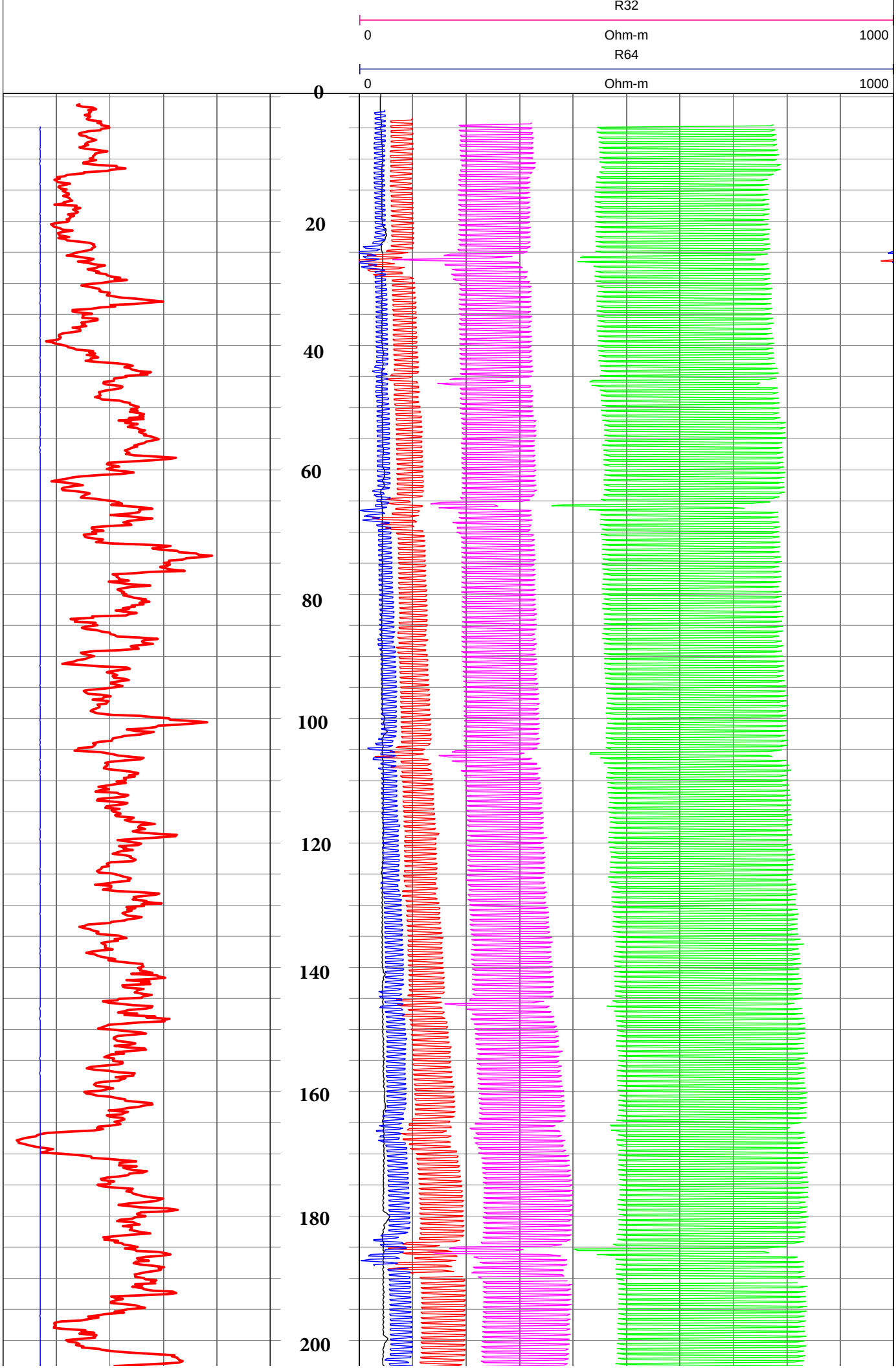
Logging Data

Logged By: **R. Fieseler, A. Balzen** Witness: **None**

Log Type	Run #	Up / Down	From	To	Feet / Min.
GR RES	1	Up	541	0	15
	2				15
	3				
	4				

Comments:

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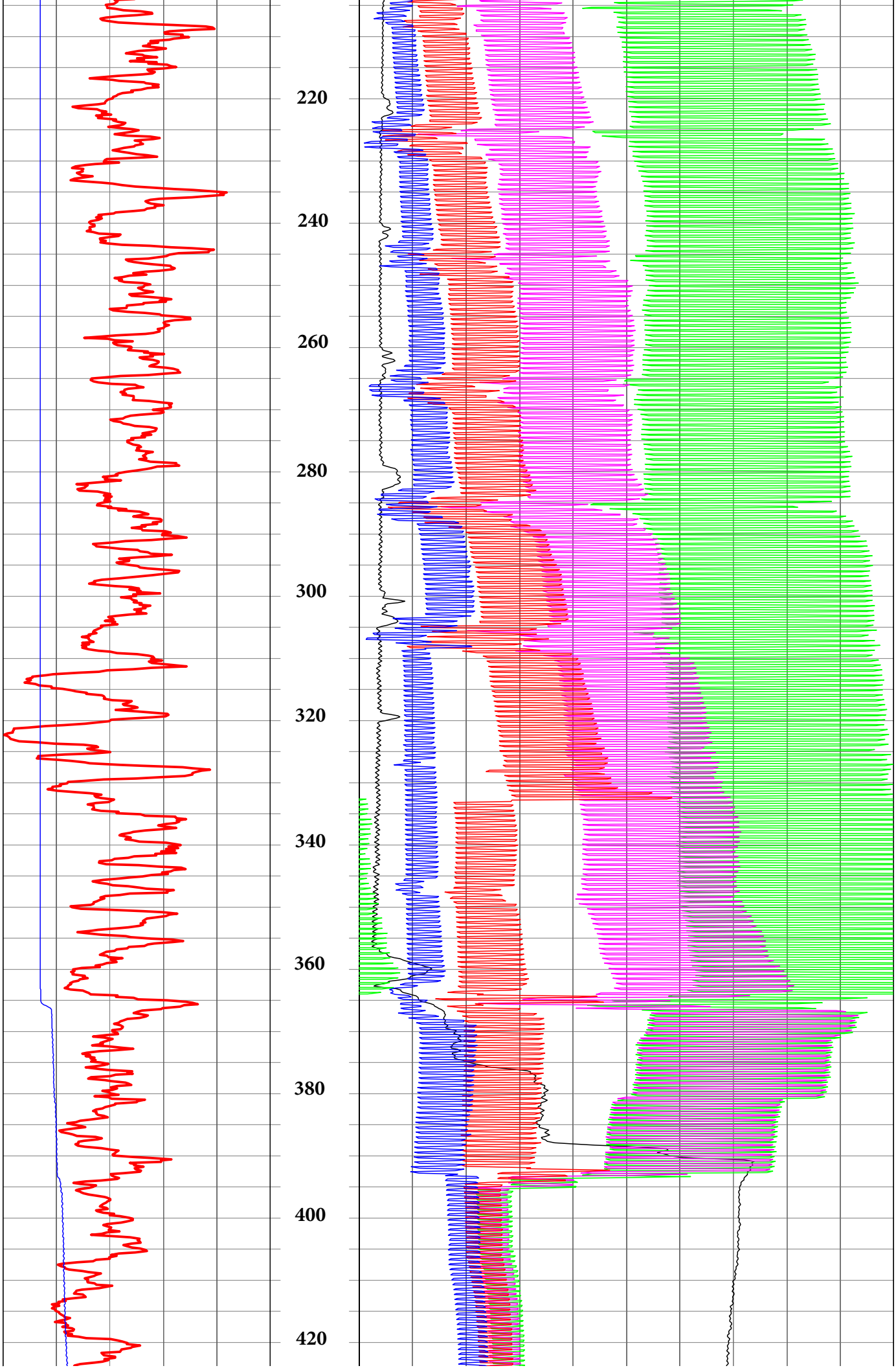
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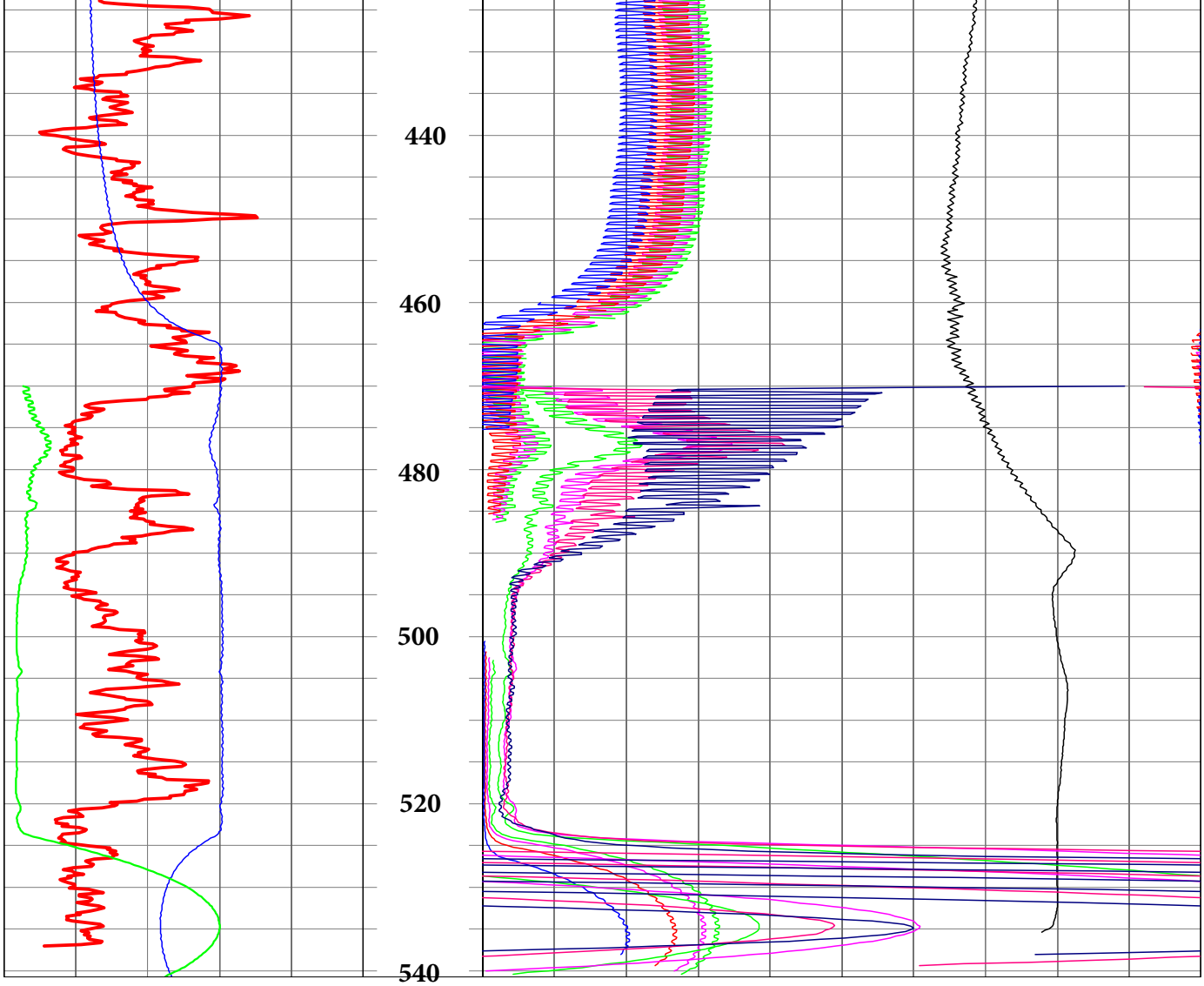
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540

Geophysical Log

Well No. 8

Blanco-Pedernales Groundwater Conservation District

Borehole Name or #: **Red Oak Mountain Well #8**

Logs: **GR RES**

Logging Dates: **6/30/2020**

601 West Main, P. O. Box 1516, Johnson City, TX 78636 - - - (830) 868-9196 - - - manager@blancocountygroundwater.org

Well Owner: **Red Oak Mountain LLC** Well Regist. #: **20200082**

Latitude: **30* 08' 22"** Longitude: **98* 33' 20"** Blanco County, Texas

Elevation MSL: **Topo: 1840** **GPS:** **Google Earth:** GPS Datum: **NAD 27**

Borehole Data

Drilling Contractor: **Apex Drilling** Date Drilled: **6/16/2020**

Measuring Point: **1.70** **Feet Above Ground Level** Driller TD: **645**

Depth Reference: **Ground Level** Logger TD: **636**

Water Level: **458.7** **Feet Below Measuring Point**

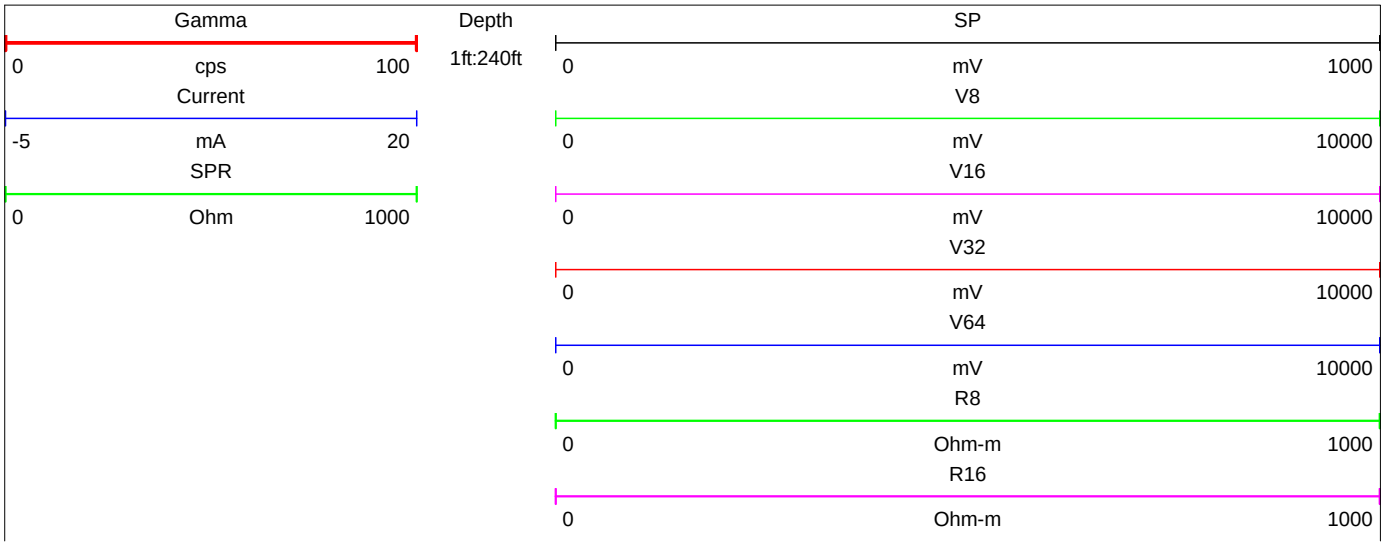
Bit Record				Casing Record			
Run	Bit Size	From	To	PVC / Steel	Size	From	To
1	8	0	50	PVC	4.5	+1.7	645
2	6.25	50	645				
3							

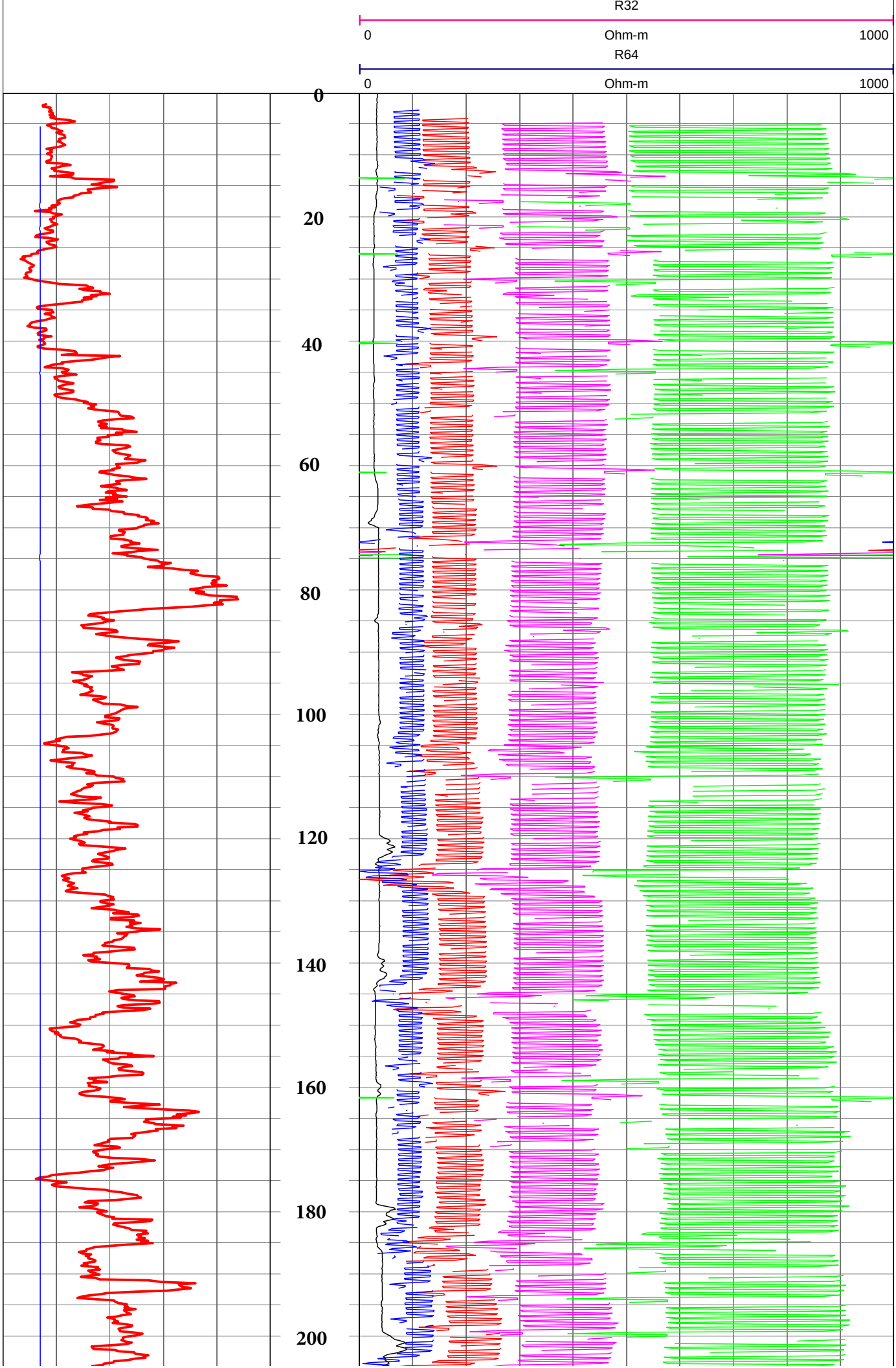
Logging Data

Logged By: **R. Fieseler, A. Balzen** Witness: **None**

Log Type	Run #	Up / Down	From	To	Feet / Min.
GR RES	1	Up	636	0	15
	2				15
	3				
	4				

Comments:

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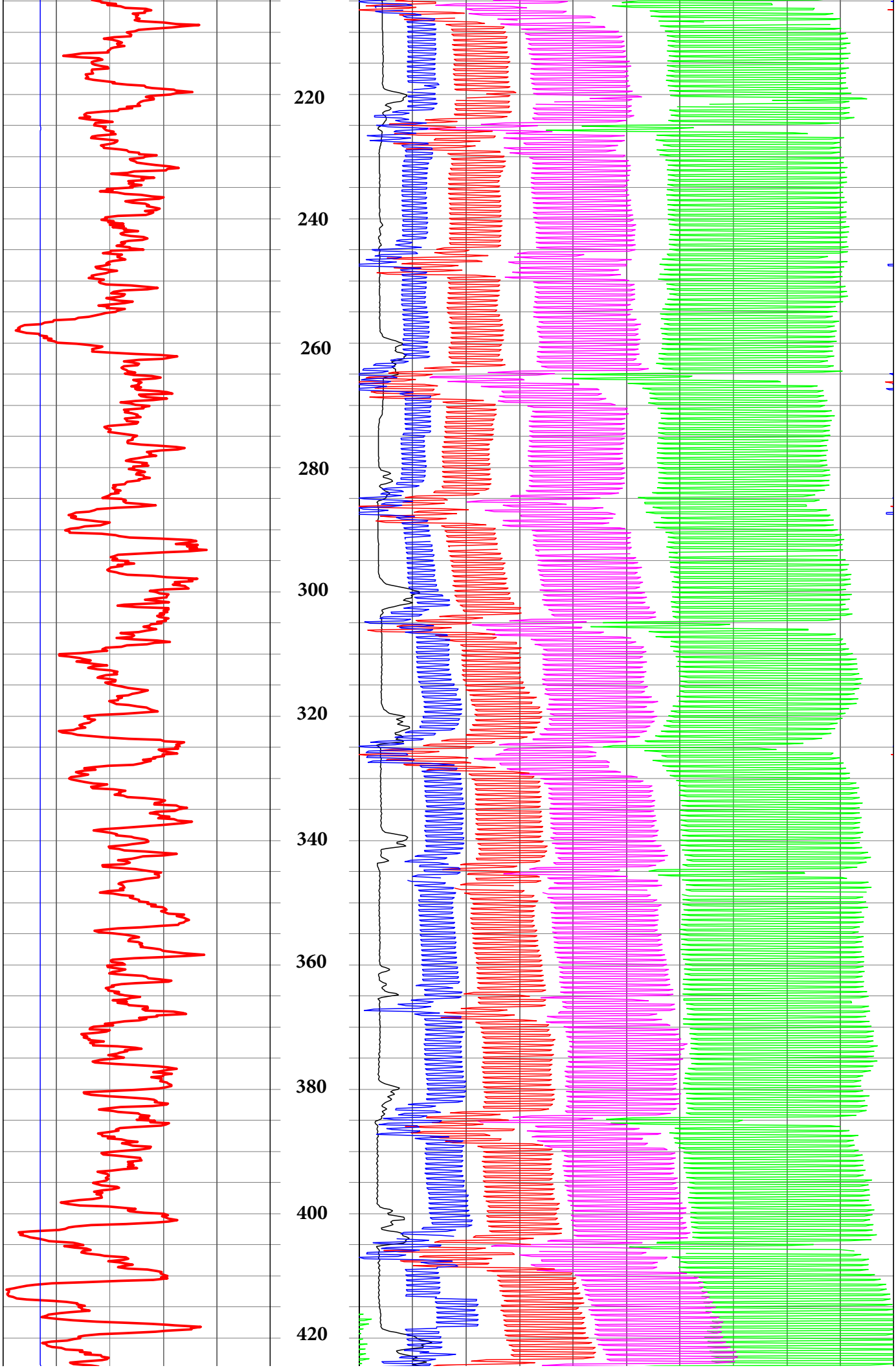
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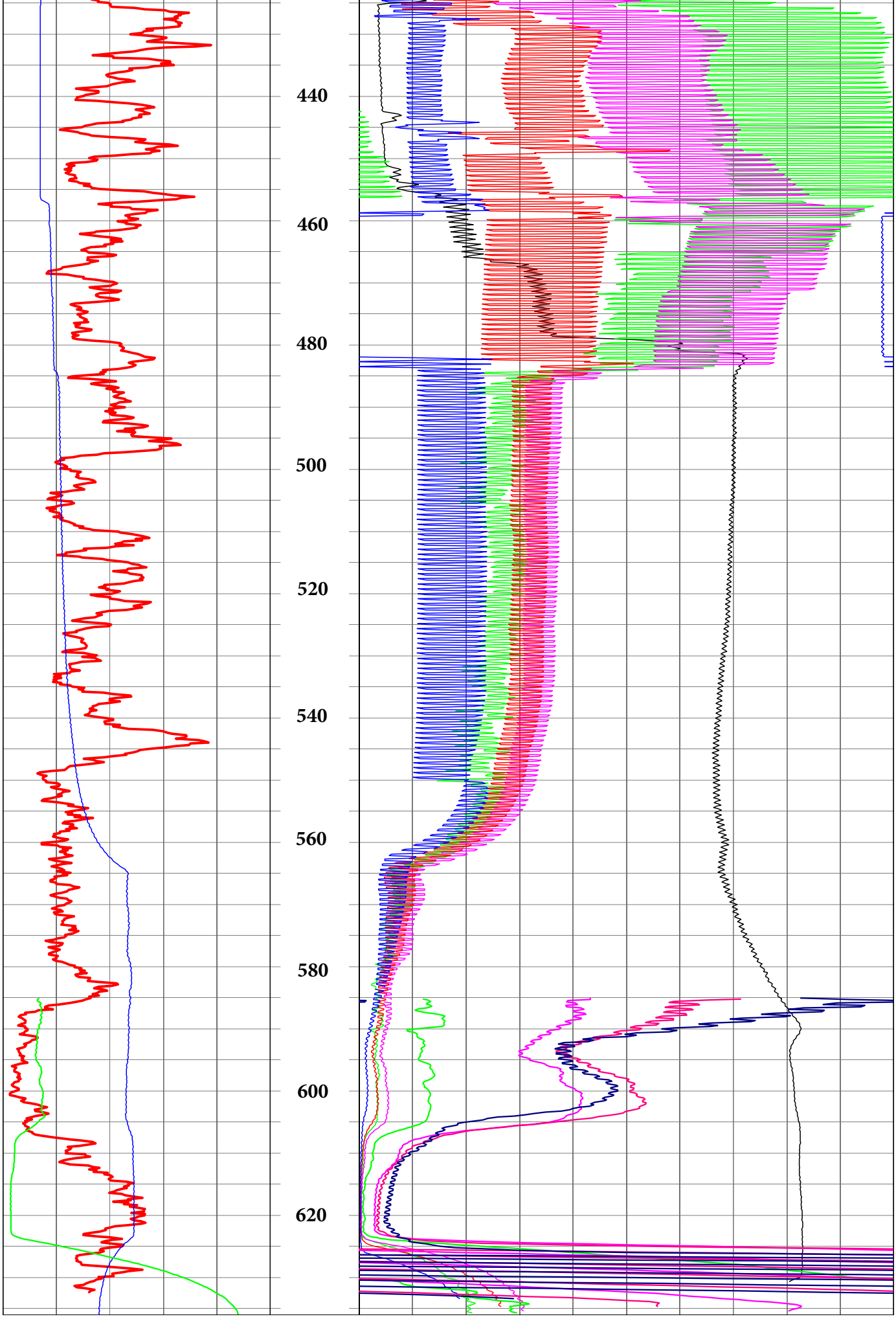
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460
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500
520
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560
580
600
620

Appendix C

State Well Reports

Well Report

Well No. 1

STATE OF TEXAS WELL REPORT for Tracking #527800

Owner:	**Bert and Joe Howard Williamson**	Owner Well #:	**No Data**
Address:	**P O Box 9305 Wichita Falls , TX 76308**	Grid #:	**57-52-8**
Well Location:	**3184 Maenius Rd (Indian Hills Entrance) Blanco, TX 78606**	Latitude:	**30° 08' 01" N**
		Longitude:	**098° 33' 48" W**
Well County:	**Blanco**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Domestic**

Drilling Start Date: **11/4/2019** Drilling End Date: **11/4/2019**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
8.5	**8**	**50**
6.25	**50**	**605**

Drilling Method: **Air Rotary**

Borehole Completion: **Straight Wall**

Annular Seal Data: **No Data**

Seal Method: **Slurry**

Sealed By: **Driller**

Distance to Property Line (ft.): **50**

Distance to Septic Field or other concentrated contamination (ft.): **100**

Distance to Septic Tank (ft.): **50**

Method of Verification: **Land Owner**

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

Water Level: **No Data**

Packers: **Burlap/Neoprene at 50 ft.**
Burlap/Neoprene at 55 ft.
Burlap/Neoprene at 390 ft.
Burlap/Neoprene at 395 ft.
Burlap/Neoprene at 540 ft.

Type of Pump: **No Data**

Well Tests: **Jetted** **Yield: 15-17 GPM**

Water Quality:

Strata Depth (ft.)	Water Type
395 - 605	**Trinity - TDS 1700**

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: **Apex Drilling, Inc.**

P.O. Box 867
Marble Falls, TX 78654

Driller Name: **Andrew Jackson Johnson** License Number: **54989**

Comments: **BPGCD # 20190113**

Report Amended on 5/15/2020 by Request #31797

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**1**	**Top Soil**
1	**16**	**Tan LS**
16	**200**	**Gray TanLS**
200	**201**	**White LS**
201	**247**	**Gray Tan LS**
247	**250**	**White Tan LS**
250	**395**	**Gray Tan LS**
395	**435**	**Tan Lt Gray LS**
435	**440**	**Tan Red LS w/ Clay**
440	**460**	**Tan LS**
460	**468**	**Red Clay**
468	**500**	**Tan Red LS w/ Clay**
500	**510**	**Tan LS**
510	**530**	**Gray Clay**
530	**540**	**Gray LS**
540	**550**	**Broken**
550	**555**	**Red LS**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
4.5	**Blank**	**New Plastic (PVC)**	**SDR17**	**2**	**425**
4.5	**Screen**	**New Plastic (PVC)**	**.035**	**425**	**465**
4.5	**Blank**	**New Plastic (PVC)**	**SDR17**	**465**	**585**
4.5	**Screen**	**New Plastic (PVC)**	**.035**	**585**	**605**

555	**579**	**Red LS w/ Gravel**
579	**581**	**Red Clay**
581	**595**	**Gravel**
595	**605**	**Elenberger Dolomite**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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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 #527801

Owner:	**Bert and Joe Howard Williamson**	Owner Well #:	**2**
Address:	**P Box 9305 Wichita Falls, TX 76308**	Grid #:	**57-52-8**
Well Location:	**3184 Maenius Rd (Indian Hills Entrance) Blanco, TX 78606**	Latitude:	**30° 08' 01" N**
		Longitude:	**098° 33' 55" W**
Well County:	**Blanco**	Elevation:	**No Data**
Number of Wells Drilled:	**2**		
Type of Work:	**New Well**	Proposed Use:	**Domestic**

Drilling Start Date: **11/5/2019** Drilling End Date: **11/5/2019**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
8.5	**0**	**50**
6.25	**50**	**460**

Drilling Method: **Air Rotary**

Borehole Completion: **Straight Wall**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**50**	**3 Benseal 4 Portland 7 Bags/Sacks**

Seal Method: **Slurry**

Sealed By: **Driller**

Distance to Property Line (ft.): **50**

Distance to Septic Field or other concentrated contamination (ft.): **100**

Distance to Septic Tank (ft.): **50**

Method of Verification: **Land Owner**

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

Water Level: **No Data**

Packers: **Burlap/Neoprene at 50 ft.**
Burlap/Neoprene at 55 ft.
Burlap/Neoprene at 340 ft.
Burlap/Neoprene at 345 ft.

Type of Pump: **No Data**

Well Tests: **Jetted** **Yield: 60 GPM**

Water Quality:

Strata Depth (ft.)	Water Type
345 - 452	**Trinity - TDS 1600**

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: **Apex Drilling, Inc.**

P.O. Box 867
Marble Falls, TX 78654

Driller Name: **Andrew Jackson Johnson** License Number: **54989**

Comments: **BPGCD # 20190114**

Report Amended on 5/15/2020 by Request #31798

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**1**	**Top Soil**
1	**16**	**Tan LS**
16	**225**	**Gray Tan LS**
225	**226**	**White LS**
226	**273**	**Tan Gray LS**
273	**280**	**Tan LS**
280	**440**	**Tan Gray LS**
440	**452**	**Tan Red LS w/ Clay**
452	**460**	**Red Clay**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
4.5	**Blank**	**New Plastic (PVC)**	**SDR17**	**2**	**380**
4.5	**Screen**	**New Plastic (PVC)**	**.035**	**380**	**440**
4.5	**Blank**	**New Plastic (PVC)**	**SDR17**	**440**	**460**

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

Well Report

Well No. 3

STATE OF TEXAS WELL REPORT for Tracking #546839

Owner:	**Red Oak Mountain, LLC**	Owner Well #:	**3**
Address:	**P O Box 1987** **Marble Falls , TX 78654**	Grid #:	**57-52-8**
		Latitude:	**30° 08' 02" N**
Well Location:	**Red Oak Mountain** **Blanco, TX**	Longitude:	**098° 33' 25" W**
Well County:	**Blanco**	Elevation:	**No Data**
Number of Wells Drilled:	**6**		

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

Drilling Start Date: **6/10/2020** Drilling End Date: **6/10/2020**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
8	**0**	**50**
6.25	**50**	**535**

Drilling Method: **Air Rotary**

Borehole Completion: **Straight Wall**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**50**	**3 Benseal 3 Portland 6 Bags/Sacks**

Seal Method: **Slurry**

Sealed By: **Driller**

Distance to Property Line (ft.): **50**

Distance to Septic Field or other concentrated contamination (ft.): **50**

Distance to Septic Tank (ft.): **100**

Method of Verification: **Land Owner**

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

Water Level: **No Data**

Packers: **Burlap/Neoprene at 50 ft.**
Burlap/Neoprene at 55 ft.
Burlap/Neoprene at 440 ft.
Burlap/Neoprene at 445 ft.

Type of Pump: **No Data**

Well Tests: **Jetted** **Yield: 24 GPM**

Water Quality:

Strata Depth (ft.)	Water Type
445 - 515	**Trinity**

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: **Apex Drilling, Inc.**

P.O. Box 867
Marble Falls, TX 78654

Driller Name: **Andrew Jackson Johnson** License Number: **54989**

Comments: **Blanco Co App. 20200077**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**1**	**Top Soil**
1	**33**	**Tan LS**
33	**315**	**Gray Tan LS**
315	**320**	**White Clay LS**
320	**490**	**Tan Gray LS**
490	**500**	**Tan Brown LS**
500	**515**	**Tan Gray LS**
515	**520**	**Tan LS Yellow Clay**
520	**523**	**Tan Red Yellow Clay**
523	**535**	**Red Tan LS**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
4.5	**Blank**	**New Plastic (PVC)**	**SDR17**	**2**	**455**
4.5	**Screen**	**New Plastic (PVC)**	**.035**	**455**	**515**
4.5	**Blank**	**New Plastic (PVC)**	**SDR17**	**515**	**535**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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

Well Report

Well No. 4

STATE OF TEXAS WELL REPORT for Tracking #546840

Owner:	**Red Oak Mountain, LLC**	Owner Well #:	**4**
Address:	**P O Box 1987** **Marble Falls, TX 78654**	Grid #:	**57-52-8**
Well Location:	**Red Oak Mountian** **Blanco, TX**	Latitude:	**30° 08' 01" N**
		Longitude:	**098° 33' 23" W**
Well County:	**Blanco**	Elevation:	**No Data**
Number of Wells Drilled:	**6**		

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

Drilling Start Date: **6/11/2020** Drilling End Date: **6/11/2020**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
8	**0**	**50**
6.25	**50**	**545**

Drilling Method: **Air Rotary**

Borehole Completion: **Straight Wall**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**50**	**3 Benseal 3 Portland 6 Bags/Sacks**

Seal Method: **Slurry**

Sealed By: **Driller**

Distance to Property Line (ft.): **50**

Distance to Septic Field or other concentrated contamination (ft.): **50**

Distance to Septic Tank (ft.): **100**

Method of Verification: **Land Owner**

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

Water Level: **No Data**

Packers: **Burlap/Neoprene at 50 ft.**
Burlap/Neoprene at 55 ft.
Burlap/Neoprene at 430 ft.
Burlap/Neoprene at 440 ft.

Type of Pump: **No Data**

Well Tests: **Jetted** **Yield: 35 GPM**

Water Quality:

Strata Depth (ft.)	Water Type
440 - 525	**Trinity - TDS 1220**

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: **Apex Drilling, Inc.**

P.O. Box 867
Marble Falls, TX 78654

Driller Name: **Andrew Jackson Johnson** License Number: **54989**

Comments: **Blanco Co App 20200078**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**1**	**Top Soil**
1	**30**	**Tan LS**
30	**315**	**Gray Tan LS**
315	**320**	**White LS**
320	**502**	**Tan Gray LS**
502	**516**	**Tan Brown LS**
516	**525**	**Gray Tan LS**
525	**531**	**Tan LS w/ Yellow Clay**
531	**537**	**Yellow Red Clay**
537	**545**	**Red LS w/ Clay**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
4.5	**Blank**	**New Plastic (PVC)**	**SDR17**	**2**	**465**
4.5	**Screen**	**New Plastic (PVC)**	**.035**	**465**	**525**
4.5	**Blank**	**New Plastic (PVC)**	**SDR17**	**525**	**545**

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

Well Report

Well No. 5

STATE OF TEXAS WELL REPORT for Tracking #546842

Owner: **Red Oak Mountain, LLC**

Address: **P O Box 1987**
Marble Falls , TX 78654

Well Location: **Red Oak Mountain**
Blanco, TX

Well County: **Blanco**

Number of Wells Drilled: **6**

Owner Well #: **5**

Grid #: **57-52-8**

Latitude: **30° 08' 01" N**

Longitude: **098° 33' 17" W**

Elevation: **No Data**

Type of Work: **New Well**

Proposed Use: **Domestic**

Drilling Start Date: **6/12/2020** Drilling End Date: **6/12/2020**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
8	**0**	**50**
6.25	**50**	**525**

Drilling Method: **Air Rotary**

Borehole Completion: **Straight Wall**

Annular Seal Data: **No Data**

Seal Method: **Slurry**

Sealed By: **Driller**

Distance to Property Line (ft.): **50**

Distance to Septic Field or other concentrated contamination (ft.): **50**

Distance to Septic Tank (ft.): **100**

Method of Verification: **Land Owner**

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

Water Level: **No Data**

Packers: **Burlap/Neoprene at 50 ft.**
Burlap/Neoprene at 55 ft.
Burlap/Neoprene at 420 ft.
Burlap/Neoprene at 430 ft.

Type of Pump: **No Data**

Well Tests: **Jetted** **Yield: 60 GPM**

Water Quality:

Strata Depth (ft.)	Water Type
442 - 505	**Trinity - TDS 1080**

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: **Apex Drilling, Inc.**

P.O. Box 867
Marble Falls, TX 78654

Driller Name: **Andrew Jackson Johnson** License Number: **54989**

Comments: **Blanco Co App 20200079**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**1**	**Top Soil**
1	**30**	**Tan LS**
30	**295**	**Gray Tan LS**
295	**300**	**White Calside**
300	**305**	**Gray LS**
305	**310**	**White Calside**
310	**442**	**Tan Gray LS**
442	**467**	**Tan Gray Clay**
467	**488**	**Tan Brown LS**
488	**507**	**Tan Gray LS**
507	**515**	**Yellow Tan Red LS**
515	**525**	**Red Tan LS**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
4.5	**Blank**	**New Plastic (PVC)**	**SDR17**	**2**	**445**
4.5	**Screen**	**New Plastic (PVC)**	**.035**	**445**	**505**
4.5	**Blank**	**New Plastic (PVC)**	**SDR17**	**505**	**525**

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.

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

Well Report

Well No. 6

STATE OF TEXAS WELL REPORT for Tracking #546843

Owner:	**Red Oak Mountain, LLC**	Owner Well #:	**6**
Address:	**P O Box 1987** **Marble Falls , TX 78654**	Grid #:	**57-52-8**
Well Location:	**Red Oak Mountain** **Blanco, TX**	Latitude:	**30° 08' 16" N**
		Longitude:	**098° 33' 10" W**
Well County:	**Blanco**	Elevation:	**No Data**
Number of Wells Drilled:	**6**		

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

Drilling Start Date: **6/17/2020** Drilling End Date: **6/17/2020**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
8	**0**	**50**
6.25	**50**	**645**

Drilling Method: **Air Rotary**

Borehole Completion: **Straight Wall**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**50**	**3 Benseal 4 Portland 7 Bags/Sacks**

Seal Method: **Slurry**

Sealed By: **Driller**

Distance to Property Line (ft.): **50**

Distance to Septic Field or other concentrated contamination (ft.): **50**

Distance to Septic Tank (ft.): **100**

Method of Verification: **Land Owner**

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

Water Level: **No Data**

Packers: **Burlap/Neoprene at 50 ft.**
Burlap/Neoprene at 55 ft.
Burlap/Neoprene at 530 ft.
Burlap/Neoprene at 540 ft.

Type of Pump: **No Data**

Well Tests: **Jetted** **Yield: 40 GPM**

Water Quality:

Strata Depth (ft.)	Water Type
540 - 620	**Trinity - TDS 920**

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: **Apex Drilling, Inc.**

P.O. Box 867
Marble Falls, TX 78654

Driller Name: **Andrew Jackson Johnson** License Number: **54989**

Comments: **Blanco Co App 20200080**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**1**	**Top Soil**
1	**17**	**Tan LS**
17	**28**	**Flint Tan LS**
28	**64**	**Tan LS**
64	**100**	**Gray Tan LS**
100	**107**	**Tan LS**
107	**560**	**Tan Gray LS**
560	**626**	**Tan Brown LS**
626	**645**	**Red Tan LS**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
4.5	**Blank**	**New Plastic (PVC)**	**SDR17**	**2**	**565**
4.5	**Screen**	**New Plastic (PVC)**	**.035**	**565**	**625**
4.5	**Blank**	**New Plastic (PVC)**	**SDR17**	**625**	**645**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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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. 7

STATE OF TEXAS WELL REPORT for Tracking #546844

Owner:	**Red Oak Mountain, LLC**	Owner Well #:	**7**
Address:	**P O Box 1987** **Marble Falls , TX 78654**	Grid #:	**57-52-8**
Well Location:	**Red Oak Mountain** **Blanco, TX**	Latitude:	**30° 08' 19" N**
		Longitude:	**098° 33' 14" W**
Well County:	**Blanco**	Elevation:	**No Data**
Number of Wells Drilled:	**6**		

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

Drilling Start Date: **6/16/2020** Drilling End Date: **6/16/2020**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
8	**0**	**50**
6.25	**50**	**625**

Drilling Method: **Air Rotary**

Borehole Completion: **Straight Wall**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**50**	**3 Benseal 3 Portland 6 Bags/Sacks**

Seal Method: **Slurry**

Sealed By: **Driller**

Distance to Property Line (ft.): **50**

Distance to Septic Field or other concentrated contamination (ft.): **50**

Distance to Septic Tank (ft.): **100**

Method of Verification: **Land Owner**

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

Water Level: **No Data**

Packers: **Burlap/Neoprene at 50 ft.**
Burlap/Neoprene at 55 ft.
Burlap/Neoprene at 525 ft.
Burlap/Neoprene at 530 ft.

Type of Pump: **No Data**

Well Tests: **Jetted** **Yield: 60 GPM**

Water Quality:

Strata Depth (ft.)	Water Type
537 - 600	**Trinity - TDS 850**

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: **Apex Drilling, Inc.**

P.O. Box 867
Marble Falls, TX 78654

Driller Name: **Andrew Jackson Johnson** License Number: **54989**

Comments: **Blanco Co App 20200081**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**1**	**Top Soil**
1	**7**	**Tan LS**
7	**24**	**Tan LS w/ Flint**
24	**54**	**Tan LS**
54	**95**	**Gray Tan LS**
95	**100**	**Tan LS**
100	**537**	**Tan Gray LS**
537	**560**	**Tan Gray**
560	**600**	**Tan Brown LS**
600	**625**	**Red LS**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
4.5	**Blank**	**New Plastic (PVC)**	**SDR17**	**2**	**545**
4.5	**Screen**	**New Plastic (PVC)**	**.035**	**545**	**605**
4.5	**Blank**	**New Plastic (PVC)**	**SDR17**	**605**	**625**

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(512) 334-5540

Well Report

Well No. 8

STATE OF TEXAS WELL REPORT for Tracking #546845

Owner:	**Red Oak Mountain, LLC**	Owner Well #:	**8**
Address:	**P O Box 1987** **Marble Falls , TX 78654**	Grid #:	**57-52-8**
		Latitude:	**30° 08' 22" N**
Well Location:	**Red oak Mountain** **Blanco, TX**	Longitude:	**098° 33' 20" W**
Well County:	**Blanco**	Elevation:	**No Data**
Number of Wells Drilled:	**6**		

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

Drilling Start Date: **6/15/2020** Drilling End Date: **6/16/2020**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
8	**0**	**50**
6.25	**50**	**645**

Drilling Method: **Air Rotary**

Borehole Completion: **Straight Wall**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**50**	**3 Benseal 3 Portland 6 Bags/Sacks**

Seal Method: **Slurry**

Sealed By: **Driller**

Distance to Property Line (ft.): **50**

Distance to Septic Field or other concentrated contamination (ft.): **50**

Distance to Septic Tank (ft.): **100**

Method of Verification: **Land Owner**

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

Water Level: **No Data**

Packers: **Burlap/Neoprene at 50 ft.**
Burlap/Neoprene at 55 ft.
Burlap/Neoprene at 540 ft.
Burlap/Neoprene at 545 ft.

Type of Pump: **No Data**

Well Tests: **Jetted** **Yield: 15-17 GPM**

Water Quality:

Strata Depth (ft.)	Water Type
545 - 625	**Trinity - TDS 670**

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: **Apex Drilling, Inc.**

P.O. Box 867
Marble Falls, TX 78654

Driller Name: **Andrew Jackson Johnson** License Number: **54989**

Comments: **Blanco Co App 20200082**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**1**	**Top Soil**
1	**20**	**Tan LS**
20	**30**	**Tan Hard w/ Flint**
30	**67**	**Tan LS**
67	**100**	**Gray Tan LS**
100	**575**	**Tan Lt Gray LS**
575	**602**	**Tan LS**
602	**610**	**Tan Brown LS**
610	**625**	**Tan Red LS**
625	**645**	**Red LS w/ Clay**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
4.5	**Blank**	**New Plastic (PVC)**	**SDR17**	**2**	**585**
4.5	**Screen**	**New Plastic (PVC)**	**.035**	**565**	**625**
4.5	**Blank**	**New Plastic (PVC)**	**SDR17**	**625**	**645**

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Appendix D

Aquifer Test Data and Analysis

Aquifer Test

Well No. 2

Red Oak Mountain Well No. 2 - Aquifer Test (June 15, 2020)

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)
6/15/20 12:58 PM	0		72.51	270.30	1,378.70	0.00			Pump Start	1,380.84	0.00
6/15/20 12:59 PM	1		72.11	271.75	1,377.25	1.45	29	20.04	Meter: 674,475.7 gallons	1,380.89	-0.04
6/15/20 1:00 PM	2		71.74	281.42	1,367.58	11.12	27	2.43		1,380.89	-0.05
6/15/20 1:01 PM	3		71.48	285.96	1,363.04	15.65	27	1.72		1,380.85	0.00
6/15/20 1:02 PM	4		71.29	288.69	1,360.31	18.38	27	1.47		1,380.93	-0.09
6/15/20 1:03 PM	5		71.17	290.67	1,358.33	20.37	27	1.33		1,380.89	-0.04
6/15/20 1:04 PM	6		71.07	292.07	1,356.93	21.77	27	1.24		1,380.93	-0.08
6/15/20 1:05 PM	7		71.01	293.46	1,355.54	23.15	27	1.17		1,380.80	0.05
6/15/20 1:06 PM	8		70.97	294.51	1,354.49	24.20	26	1.07		1,381.01	-0.16
6/15/20 1:07 PM	9		70.94	295.36	1,353.64	25.05	27	1.08		1,380.88	-0.03
6/15/20 1:08 PM	10		70.91	296.20	1,352.80	25.90	27	1.04		1,380.89	-0.04
6/15/20 1:09 PM	11		70.89	297.00	1,352.00	26.70	27	1.01		1,380.79	0.06
6/15/20 1:10 PM	12		70.87	297.66	1,351.34	27.36	27	0.99		1,380.80	0.05
6/15/20 1:11 PM	13		70.86	298.28	1,350.72	27.98	27	0.97		1,380.65	0.19
6/15/20 1:12 PM	14		70.86	298.83	1,350.17	28.53	27	0.95		1,380.83	0.01
6/15/20 1:13 PM	15		70.86	299.29	1,349.71	28.98	26	0.90		1,380.84	0.01
6/15/20 1:18 PM	20		70.95	301.46	1,347.54	31.16	27	0.87	pH: 6.90/ EC: 2.11	1,380.61	0.23
6/15/20 1:23 PM	25		71.01	302.95	1,346.05	32.64	26	0.80	pH: 6.93/ EC: 2.19	1,380.45	0.40
6/15/20 1:28 PM	30		71.03	304.62	1,344.38	34.32	26	0.76	pH: 6.94/ EC: 2.10	1,380.31	0.53
6/15/20 1:33 PM	35		71.08	305.78	1,343.22	35.48	26	0.73	pH: 6.91/ EC: 2.12	1,380.05	0.79
6/15/20 1:38 PM	40		71.09	306.81	1,342.20	36.50	26	0.71	pH: 6.90/ EC: 2.13	1,379.79	1.05
6/15/20 1:43 PM	45		71.04	307.75	1,341.26	37.44	26	0.69	pH: 6.90/ EC: 2.15	1,379.50	1.34
6/15/20 1:58 PM	60		71.09	309.94	1,339.06	39.63	26	0.66	pH: 6.90/ EC: 2.15	1,378.64	2.20
6/15/20 2:13 PM	75		71.12	311.71	1,337.29	41.40	26	0.63	pH: 6.86/ EC: 2.11	1,378.05	2.79
6/15/20 2:28 PM	90		71.14	313.17	1,335.83	42.86	26	0.61	pH: 6.88/ EC: 2.12	1,377.61	3.23
6/15/20 2:43 PM	105		71.15	314.49	1,334.51	44.19	26	0.59	pH: 6.90/ EC: 2.11	1,376.94	3.90
6/15/20 2:58 PM	120		70.96	315.55	1,333.46	45.24	25	0.55	pH: 6.84/ EC: 2.12	1,376.35	4.50
6/15/20 3:28 PM	150		70.97	317.47	1,331.53	47.17	26	0.55	pH: 6.90/ EC: 2.06	1,375.33	5.51
6/15/20 3:58 PM	180		71.06	319.20	1,329.80	48.90	25	0.51	pH: 6.90/ EC: 2.07	1,374.37	6.47
6/15/20 4:28 PM	210		70.98	320.54	1,328.46	50.24	26	0.52	pH: 6.92/ EC: 2.09	1,373.54	7.31
6/15/20 4:58 PM	240		70.91	321.65	1,327.35	51.35				1,372.70	8.14
6/15/20 5:58 PM	300		70.92	323.68	1,325.32	53.37				1,371.44	9.41
6/15/20 6:58 PM	360		70.92	325.47	1,323.53	55.16				1,370.29	10.55
6/15/20 7:58 PM	420		70.94	326.98	1,322.02	56.67				1,369.08	11.76
6/15/20 8:58 PM	480		70.94	328.30	1,320.70	57.99				1,368.13	12.71

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4 inches Horsepower = 5 HP
MSL = Mean Sea Level Pump Setting = 420 ft EC=Electrical conductivity (mS/cm)

Red Oak Mountain Well No. 2 - Aquifer Test (June 15, 2020)

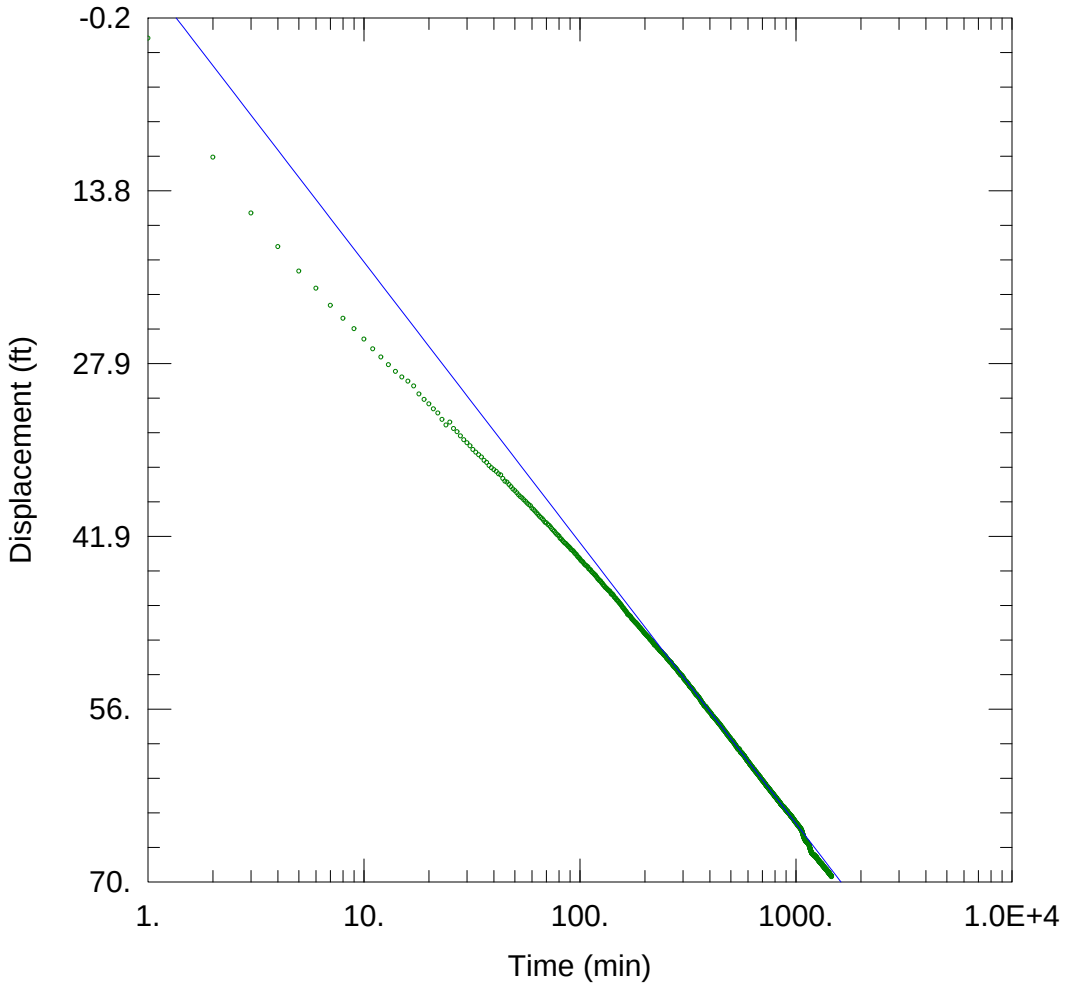
Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW Well No. 2 Temperature (F)	PW Well No. 2 Water Level (ft bgs)	PW Well No. 2 Water Level (ft MSL)	PW Well No. 2 Drawdown (ft)	PW Well No. 2 Pump Rate (gpm)	PW Well No. 2 Specific Capacity (gpm/ft)	Comments	OW Well No. 1 Water Level (ft MSL)	OW Well No. 1 Drawdown (ft)
6/15/20 9:58 PM	540		70.95	329.54	1,319.46	59.24				1,367.13	13.72
6/15/20 10:58 PM	600		70.97	330.48	1,318.52	60.17				1,366.25	14.60
6/15/20 11:58 PM	660		70.97	331.47	1,317.53	61.16				1,365.57	15.28
6/16/20 12:58 AM	720		70.96	332.30	1,316.70	62.00				1,364.69	16.15
6/16/20 1:58 AM	780		70.97	333.09	1,315.91	62.79				1,364.07	16.78
6/16/20 2:58 AM	840		70.99	333.79	1,315.21	63.49				1,363.41	17.43
6/16/20 3:58 AM	900		71.00	334.45	1,314.55	64.15				1,362.80	18.05
6/16/20 4:58 AM	960		71.00	335.05	1,313.95	64.75				1,362.16	18.68
6/16/20 5:58 AM	1,020		71.00	335.65	1,313.35	65.35				1,361.48	19.36
6/16/20 6:58 AM	1,080		71.01	336.51	1,312.49	66.21				1,360.87	19.97
6/16/20 7:58 AM	1,140		71.02	337.19	1,311.81	66.89				1,360.11	20.73
6/16/20 8:58 AM	1,200		71.02	338.09	1,310.91	67.79				1,359.34	21.50
6/16/20 9:58 AM	1,260		71.02	338.44	1,310.56	68.14				1,359.12	21.72
6/16/20 10:58 AM	1,320		71.02	338.85	1,310.15	68.55				1,358.72	22.12
6/16/20 11:58 AM	1,380		71.02	339.29	1,309.71	68.99				1,358.30	22.54
6/16/20 12:58 PM	1,440		71.03	339.70	1,309.30	69.39				1,357.91	22.94
6/16/20 1:23 PM	1,465	0	71.03	339.88	1,309.13	69.57	26	0.37	Pump Stop	1,357.76	23.08
6/16/20 1:24 PM	1,466	1	71.03	332.12	1,316.88	61.82			Meter: 712,413.6 gallons	1,357.78	23.06
6/16/20 1:25 PM	1,467	2	71.03	326.17	1,322.83	55.87			Avg. Pump Rate: 25.89	1,357.83	23.02
6/16/20 1:26 PM	1,468	3	71.03	322.86	1,326.14	52.56				1,357.86	22.99
6/16/20 1:27 PM	1,469	4	71.02	320.65	1,328.36	50.34				1,357.91	22.93
6/16/20 1:28 PM	1,470	5	71.00	318.91	1,330.09	48.61				1,357.72	23.13
6/16/20 1:29 PM	1,471	6	71.00	317.52	1,331.48	47.22				1,357.78	23.06
6/16/20 1:30 PM	1,472	7	70.99	316.38	1,332.62	46.08				1,357.77	23.07
6/16/20 1:31 PM	1,473	8	70.99	315.37	1,333.63	45.07				1,357.81	23.03
6/16/20 1:32 PM	1,474	9	70.99	314.44	1,334.56	44.14				1,357.75	23.09
6/16/20 1:33 PM	1,475	10	70.99	313.68	1,335.32	43.37				1,357.72	23.12
6/16/20 1:34 PM	1,476	11	71.00	312.94	1,336.06	42.64				1,357.75	23.09
6/16/20 1:35 PM	1,477	12	71.00	312.28	1,336.72	41.97				1,357.73	23.11
6/16/20 1:36 PM	1,478	13	71.00	311.69	1,337.31	41.39				1,357.78	23.07
6/16/20 1:37 PM	1,479	14	71.00	311.08	1,337.92	40.78				1,357.86	22.99
6/16/20 1:38 PM	1,480	15	71.01	310.55	1,338.45	40.25				1,357.76	23.08
6/16/20 1:43 PM	1,485	20	71.00	308.34	1,340.66	38.03				1,357.83	23.02
6/16/20 1:48 PM	1,490	25	70.99	306.68	1,342.32	36.38				1,357.82	23.02
6/16/20 1:53 PM	1,495	30	70.98	305.39	1,343.61	35.08				1,358.06	22.78

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4 inches Horsepower = 5 HP
MSL = Mean Sea Level Pump Setting = 420 ft EC=Electrical conductivity (mS/cm)

Red Oak Mountain Well No. 2 - Aquifer Test (June 15, 2020)

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)
6/16/20 1:58 PM	1,500	35	70.97	304.27	1,344.74	33.96				1,358.19	22.66
6/16/20 2:03 PM	1,505	40	70.97	303.29	1,345.71	32.99				1,358.38	22.47
6/16/20 2:08 PM	1,510	45	70.97	302.52	1,346.49	32.21				1,358.49	22.36
6/16/20 2:23 PM	1,525	60	70.97	300.54	1,348.46	30.24				1,359.02	21.82
6/16/20 2:38 PM	1,540	75	70.97	299.05	1,349.95	28.75				1,359.58	21.26
6/16/20 2:53 PM	1,555	90	70.96	297.72	1,351.28	27.42				1,360.25	20.59
6/16/20 3:08 PM	1,570	105	70.95	296.67	1,352.33	26.37				1,360.70	20.14
6/16/20 3:23 PM	1,585	120	70.96	295.75	1,353.25	25.45				1,361.15	19.69
6/16/20 3:53 PM	1,615	150	70.99	294.12	1,354.89	23.81				1,362.13	18.71
6/16/20 4:23 PM	1,645	180	71.02	292.81	1,356.19	22.50				1,362.85	17.99
6/16/20 4:53 PM	1,675	210	71.07	291.71	1,357.29	21.41				1,363.63	17.21
6/16/20 5:23 PM	1,705	240	71.15	290.67	1,358.33	20.36				1,364.30	16.54
6/16/20 6:23 PM	1,765	300	71.21	289.02	1,359.99	18.71				1,365.29	15.55
6/16/20 7:23 PM	1,825	360	71.23	287.69	1,361.31	17.38				1,366.34	14.50
6/16/20 8:23 PM	1,885	420	71.24	286.59	1,362.41	16.28				1,366.95	13.89
6/16/20 9:23 PM	1,945	480	71.25	285.61	1,363.39	15.31				1,367.66	13.19
6/16/20 10:23 PM	2,005	540	71.24	284.74	1,364.26	14.44				1,368.33	12.52
6/16/20 11:23 PM	2,065	600	71.25	284.02	1,364.98	13.72				1,368.90	11.94
6/17/20 12:23 AM	2,125	660	71.25	283.35	1,365.65	13.04				1,369.42	11.42
6/17/20 1:23 AM	2,185	720	71.25	282.75	1,366.25	12.45				1,369.95	10.89
6/17/20 2:23 AM	2,245	780	71.25	282.23	1,366.77	11.93				1,370.32	10.52
6/17/20 3:23 AM	2,305	840	71.25	281.73	1,367.27	11.43				1,370.66	10.18
6/17/20 4:23 AM	2,365	900	71.24	281.29	1,367.71	10.99				1,371.17	9.68
6/17/20 5:23 AM	2,425	960	71.24	280.88	1,368.12	10.58				1,371.33	9.51
6/17/20 6:23 AM	2,485	1,020	71.23	280.54	1,368.46	10.23				1,371.71	9.13
6/17/20 7:23 AM	2,545	1,080	71.21	280.66	1,368.34	10.36				1,371.61	9.23
6/17/20 8:23 AM	2,605	1,140	71.23	280.45	1,368.55	10.15				1,371.86	8.98

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4 inches Horsepower = 5 HP
MSL = Mean Sea Level Pump Setting = 420 ft EC=Electrical conductivity (mS/cm)



WELL TEST ANALYSIS

Data Set: \...\Well No. 2.aqt
Date: 07/17/20 Time: 10:58:09

PROJECT INFORMATION

Company: WRGS
Client: Lone Star Land Partners
Project: 083-001-20
Location: Blanco County
Test Well: Well No. 2
Test Date: 6-15-20

AQUIFER DATA

Saturated Thickness: 190. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

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

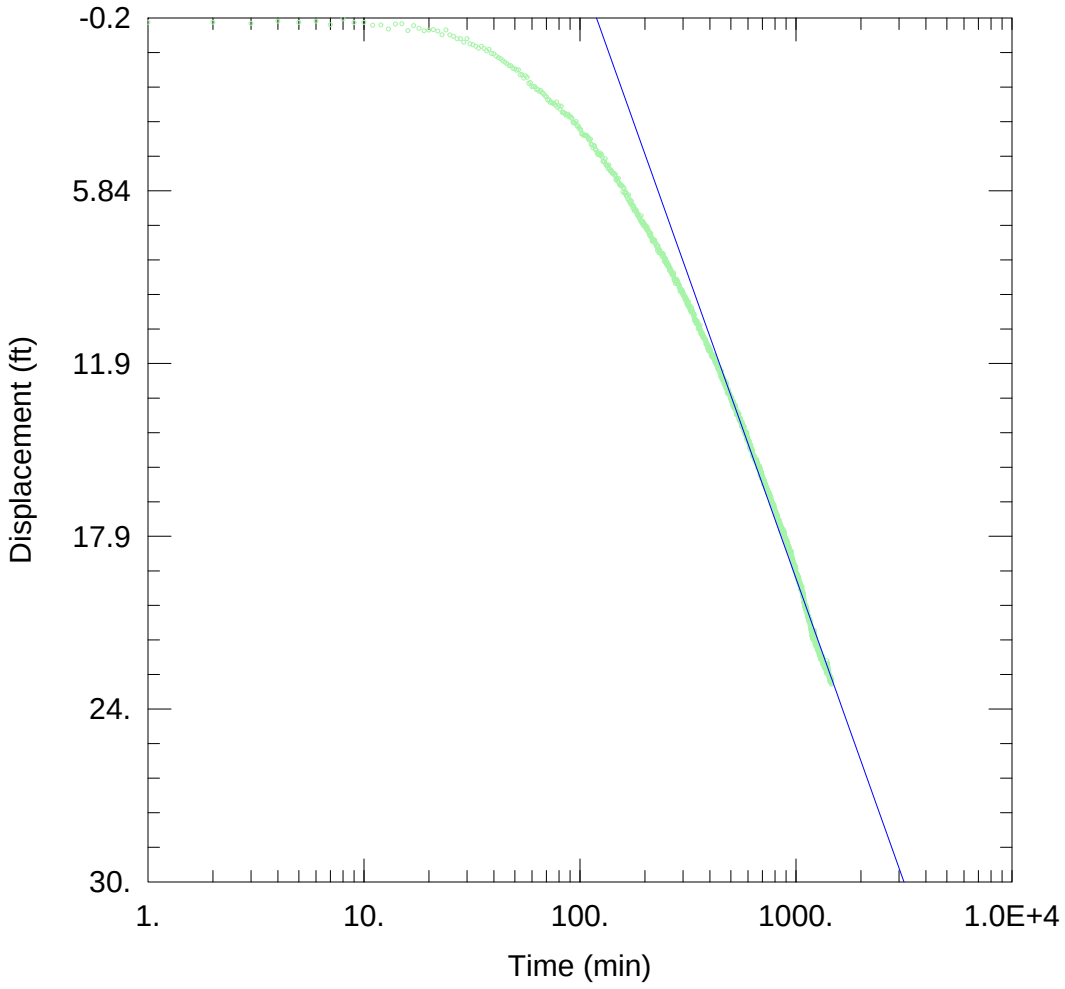
Observation Wells

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

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob

T = 40.2 ft^2/day K = 0.21 ft/day



WELL TEST ANALYSIS

Data Set: \...\Well No. 1.aqt
Date: 07/17/20 Time: 10:57:31

PROJECT INFORMATION

Company: WRGS
Client: Lone Star Land Partners
Project: 083-001-20
Location: Blanco County
Test Well: Well No. 2
Test Date: 6-15-20

AQUIFER DATA

Saturated Thickness: 190. 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	612	0

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob

T = 43.24 ft^2/day S = 2.195E-5

Aquifer Test

Well No. 3

Red Oak Mountain Well No. 3 - Aquifer Test (June 17, 2020)

Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW Well No. 3 Temperature (F)	PW Well No. 3 Water Level (ft bgs)	PW Well No. 3 Water Level (ft MSL)	PW Well No. 3 Drawdown (ft)	PW Well No. 3 Pump Rate (gpm)	PW Well No. 3 Specific Capacity (gpm/ft)	Comments	OW Well No. 4 Water Level (ft MSL)	OW Well No. 4 Drawdown (ft)
6/17/20 10:41 AM	0		71.39	352.61	1,375.39	0.00			Pump Start	1,377.55	0.00
6/17/20 10:42 AM	1		71.39	355.29	1,372.71	2.68			Meter: 712,413.692 gallons	1,373.77	3.78
6/17/20 10:43 AM	2		71.40	358.88	1,369.12	6.27	14.0	2.23		1,370.63	6.91
6/17/20 10:44 AM	3		71.39	361.64	1,366.36	9.03				1,367.99	9.56
6/17/20 10:45 AM	4		71.38	364.16	1,363.84	11.55				1,365.62	11.93
6/17/20 10:46 AM	5		71.40	366.37	1,361.63	13.77				1,363.49	14.06
6/17/20 10:47 AM	6		71.41	368.38	1,359.63	15.77				1,361.52	16.03
6/17/20 10:48 AM	7		71.39	370.28	1,357.72	17.67				1,359.80	17.75
6/17/20 10:49 AM	8		71.39	371.85	1,356.15	19.24				1,358.16	19.39
6/17/20 10:50 AM	9		71.43	373.36	1,354.64	20.76				1,356.60	20.95
6/17/20 10:51 AM	10		71.42	374.89	1,353.11	22.28				1,355.30	22.25
6/17/20 10:52 AM	11		71.41	376.07	1,351.93	23.46				1,354.11	23.44
6/17/20 10:53 AM	12		71.43	377.16	1,350.84	24.55				1,352.93	24.62
6/17/20 10:54 AM	13		71.42	378.42	1,349.58	25.81				1,351.80	25.75
6/17/20 10:55 AM	14		71.39	379.52	1,348.48	26.91				1,350.74	26.81
6/17/20 10:56 AM	15		71.43	380.42	1,347.58	27.81				1,349.77	27.78
6/17/20 11:01 AM	20		71.52	384.67	1,343.33	32.06				1,345.69	31.86
6/17/20 11:06 AM	25		71.52	387.79	1,340.21	35.18				1,342.59	34.95
6/17/20 11:11 AM	30		71.53	390.34	1,337.67	37.73	13.0	0.34	pH: 7.32/ EC: 2.84	1,340.13	37.42
6/17/20 11:26 AM	45		71.57	395.47	1,332.53	42.87				1,335.16	42.39
6/17/20 11:41 AM	60		71.61	398.46	1,329.54	45.86				1,332.18	45.37
6/17/20 11:56 AM	75		71.70	400.47	1,327.54	47.86				1,330.26	47.29
6/17/20 12:11 PM	90		71.75	401.99	1,326.01	49.39				1,328.88	48.67
6/17/20 12:26 PM	105		71.76	402.83	1,325.17	50.22				1,327.89	49.66
6/17/20 12:41 PM	120		71.77	403.55	1,324.45	50.94				1,327.26	50.28
6/17/20 1:11 PM	150		71.79	404.60	1,323.41	51.99	13.0	0.25	pH: 7.23/ EC: 3.2	1,326.15	51.40
6/17/20 1:41 PM	180		71.85	405.55	1,322.45	52.94				1,324.94	52.61
6/17/20 2:11 PM	210		71.82	406.54	1,321.46	53.93				1,324.18	53.37
6/17/20 2:41 PM	240		71.85	406.83	1,321.17	54.22				1,323.79	53.76
6/17/20 3:41 PM	300		71.84	407.36	1,320.64	54.75				1,323.30	54.25
6/17/20 4:41 PM	360		71.87	407.49	1,320.51	54.89				1,323.01	54.54
6/17/20 5:41 PM	420		71.89	407.82	1,320.18	55.21				1,322.61	54.94
6/17/20 6:41 PM	480		71.92	408.18	1,319.82	55.58				1,322.30	55.24
6/17/20 7:41 PM	540		71.92	408.47	1,319.53	55.86				1,322.06	55.49
6/17/20 8:41 PM	600		71.94	408.63	1,319.37	56.02				1,321.85	55.70

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4 inches Horsepower = 3 HP
MSL = Mean Sea Level Pump Setting = 500 ft EC=Electrical conductivity (mS/cm)

Red Oak Mountain Well No. 3 - Aquifer Test (June 17, 2020)

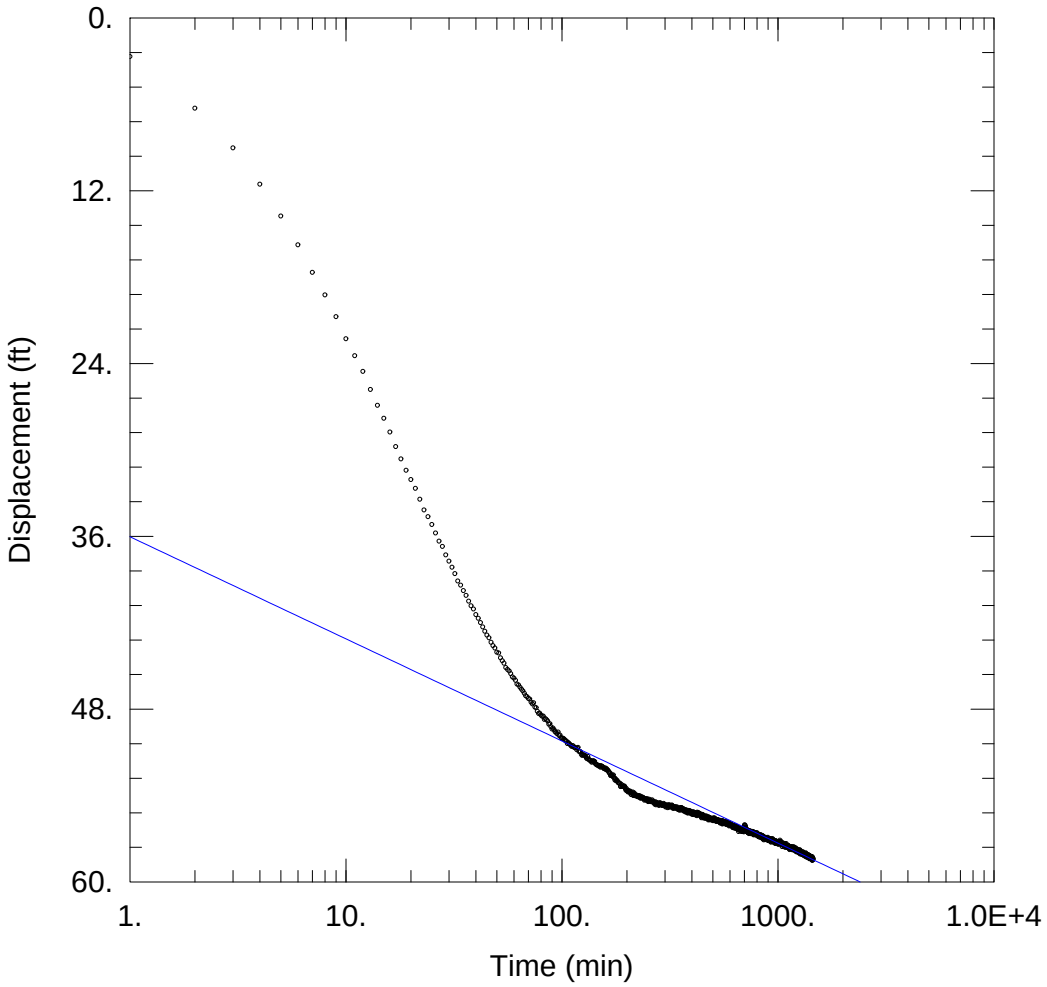
Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW Well No. 3 Temperature (F)	PW Well No. 3 Water Level (ft bgs)	PW Well No. 3 Water Level (ft MSL)	PW Well No. 3 Drawdown (ft)	PW Well No. 3 Pump Rate (gpm)	PW Well No. 3 Specific Capacity (gpm/ft)	Comments	OW Well No. 4 Water Level (ft MSL)	OW Well No. 4 Drawdown (ft)
6/17/20 9:41 PM	660		71.97	408.92	1,319.08	56.31				1,321.60	55.95
6/17/20 10:41 PM	720		71.92	409.03	1,318.97	56.42				1,321.48	56.07
6/17/20 11:41 PM	780		71.96	409.26	1,318.74	56.65				1,321.27	56.28
6/18/20 12:41 AM	840		71.96	409.46	1,318.54	56.85				1,321.08	56.47
6/18/20 1:41 AM	900		72.03	409.61	1,318.39	57.00				1,320.94	56.61
6/18/20 2:41 AM	960		71.96	409.81	1,318.19	57.20				1,320.79	56.76
6/18/20 3:41 AM	1,020		71.96	409.93	1,318.08	57.32				1,320.65	56.90
6/18/20 4:41 AM	1,080		71.95	410.10	1,317.90	57.49				1,320.45	57.10
6/18/20 5:41 AM	1,140		71.97	410.22	1,317.78	57.61				1,320.31	57.24
6/18/20 6:41 AM	1,200		72.00	410.23	1,317.77	57.63				1,320.13	57.42
6/18/20 7:41 AM	1,260		71.99	410.52	1,317.48	57.91				1,320.05	57.50
6/18/20 8:41 AM	1,320		71.96	410.73	1,317.27	58.12				1,319.87	57.68
6/18/20 9:41 AM	1,380		71.97	410.71	1,317.29	58.10				1,319.70	57.85
6/18/20 10:41 AM	1,440		72.00	411.03	1,316.97	58.43				1,319.54	58.01
6/18/20 10:56 AM	1,455	0	72.01	411.03	1,316.97	58.42	13.0	0.22	Pump Stop	1,319.50	58.05
6/18/20 10:57 AM	1,456	1	72.01	408.61	1,319.39	56.00			Meter: 731,418.138 gallons	1,322.63	54.92
6/18/20 10:58 AM	1,457	2	72.51	404.98	1,323.02	52.37			Avg. Pump Rate: 13.06 gpm	1,326.02	51.53
6/18/20 10:59 AM	1,458	3	73.21	401.93	1,326.07	49.32				1,328.94	48.61
6/18/20 11:00 AM	1,459	4	73.61	399.22	1,328.78	46.61				1,331.60	45.95
6/18/20 11:01 AM	1,460	5	73.70	396.68	1,331.32	44.07				1,334.12	43.43
6/18/20 11:02 AM	1,461	6	73.54	394.36	1,333.64	41.75				1,336.40	41.15
6/18/20 11:03 AM	1,462	7	73.37	392.16	1,335.84	39.55				1,338.63	38.92
6/18/20 11:04 AM	1,463	8	73.22	390.02	1,337.98	37.41				1,340.68	36.87
6/18/20 11:05 AM	1,464	9	73.14	387.97	1,340.03	35.36				1,342.62	34.93
6/18/20 11:06 AM	1,465	10	73.03	386.18	1,341.83	33.57				1,344.41	33.14
6/18/20 11:07 AM	1,466	11	72.94	384.50	1,343.51	31.89				1,346.10	31.45
6/18/20 11:08 AM	1,467	12	72.89	382.87	1,345.13	30.26				1,347.68	29.87
6/18/20 11:09 AM	1,468	13	72.81	381.42	1,346.58	28.81				1,349.17	28.38
6/18/20 11:10 AM	1,469	14	72.81	379.95	1,348.05	27.35				1,350.54	27.01
6/18/20 11:11 AM	1,470	15	72.73	378.66	1,349.34	26.05				1,351.89	25.66
6/18/20 11:16 AM	1,475	20	72.35	372.93	1,355.07	20.32				1,357.47	20.08
6/18/20 11:21 AM	1,480	25	72.15	368.73	1,359.27	16.12				1,361.53	16.02
6/18/20 11:26 AM	1,485	30	72.02	365.77	1,362.23	13.16				1,364.37	13.18
6/18/20 11:41 AM	1,500	45	72.10	360.96	1,367.04	8.35				1,369.01	8.54
6/18/20 11:56 AM	1,515	60	72.16	359.09	1,368.91	6.48				1,370.93	6.62

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4 inches Horsepower = 3 HP
MSL = Mean Sea Level Pump Setting = 500 ft EC=Electrical conductivity (mS/cm)

Red Oak Mountain Well No. 3 - Aquifer Test (June 17, 2020)

Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW Well No. 3 Temperature (F)	PW Well No. 3 Water Level (ft bgs)	PW Well No. 3 Water Level (ft MSL)	PW Well No. 3 Drawdown (ft)	PW Well No. 3 Pump Rate (gpm)	PW Well No. 3 Specific Capacity (gpm/ft)	Comments	OW Well No. 4 Water Level (ft MSL)	OW Well No. 4 Drawdown (ft)
6/18/20 12:11 PM	1,530	75	72.24	358.37	1,369.63	5.76				1,371.77	5.78
6/18/20 12:26 PM	1,545	90	72.20	357.85	1,370.15	5.24				1,372.19	5.36
6/18/20 12:41 PM	1,560	105	72.20	357.56	1,370.44	4.95				1,372.46	5.09
6/18/20 12:56 PM	1,575	120	72.22	357.38	1,370.62	4.78				1,372.64	4.90
6/18/20 1:26 PM	1,605	150	72.31	357.04	1,370.96	4.43				1,372.99	4.56
6/18/20 1:56 PM	1,635	180	72.29	356.78	1,371.22	4.17				1,373.29	4.26
6/18/20 2:26 PM	1,665	210	72.09	356.45	1,371.55	3.85				1,373.55	3.99
6/18/20 2:56 PM	1,695	240	71.94	356.38	1,371.62	3.77				1,373.65	3.90
6/18/20 3:56 PM	1,755	300	71.73	356.08	1,371.92	3.47				1,373.88	3.67
6/18/20 4:56 PM	1,815	360	71.65	355.79	1,372.21	3.18				1,374.31	3.24
6/18/20 5:56 PM	1,875	420	71.52	355.37	1,372.63	2.76				1,374.62	2.93
6/18/20 6:56 PM	1,935	480	71.42	354.93	1,373.07	2.32				1,374.89	2.66
6/18/20 7:56 PM	1,995	540	71.44	354.79	1,373.21	2.18				1,375.12	2.43
6/18/20 8:56 PM	2,055	600	71.42	354.64	1,373.36	2.04				1,375.35	2.20
6/18/20 9:56 PM	2,115	660	71.44	354.39	1,373.62	1.78				1,375.53	2.01
6/18/20 10:56 PM	2,175	720	71.40	354.15	1,373.85	1.54				1,375.75	1.80
6/18/20 11:56 PM	2,235	780	71.43	354.07	1,373.93	1.46				1,375.98	1.57
6/19/20 12:56 AM	2,295	840	71.38	353.89	1,374.11	1.29				1,376.07	1.48
6/19/20 1:56 AM	2,355	900	71.37	353.80	1,374.20	1.19				1,376.28	1.27
6/19/20 2:56 AM	2,415	960	71.37	353.57	1,374.43	0.96				1,376.45	1.10
6/19/20 3:56 AM	2,475	1,020	71.35	353.41	1,374.59	0.80				1,376.58	0.97
6/19/20 4:56 AM	2,535	1,080	71.36	353.24	1,374.76	0.63				1,376.70	0.85
6/19/20 5:56 AM	2,595	1,140	71.34	353.09	1,374.91	0.48				1,376.81	0.73
6/19/20 6:56 AM	2,655	1,200	71.37	353.10	1,374.90	0.49				1,376.93	0.62
6/19/20 7:56 AM	2,715	1,260	71.34	352.93	1,375.07	0.32				1,377.08	0.47
6/19/20 8:56 AM	2,775	1,320	71.34	352.87	1,375.13	0.26				1,377.13	0.42
6/19/20 9:27 AM	2,806	1,351	71.31	352.88	1,375.12	0.27				1,377.23	0.32

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4 inches Horsepower = 3 HP
MSL = Mean Sea Level Pump Setting = 500 ft EC=Electrical conductivity (mS/cm)



WELL TEST ANALYSIS

Data Set: \...\PW 3.aqt
Date: 07/23/20 Time: 15:24:00

PROJECT INFORMATION

Company: Wet Rock Groundwater Services
Client: Lone Star Land Partners, LLC
Location: Blanco County
Test Well: Well No. 3
Test Date: 6-17-20

AQUIFER DATA

Saturated Thickness: 182. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well No. 3	0	0

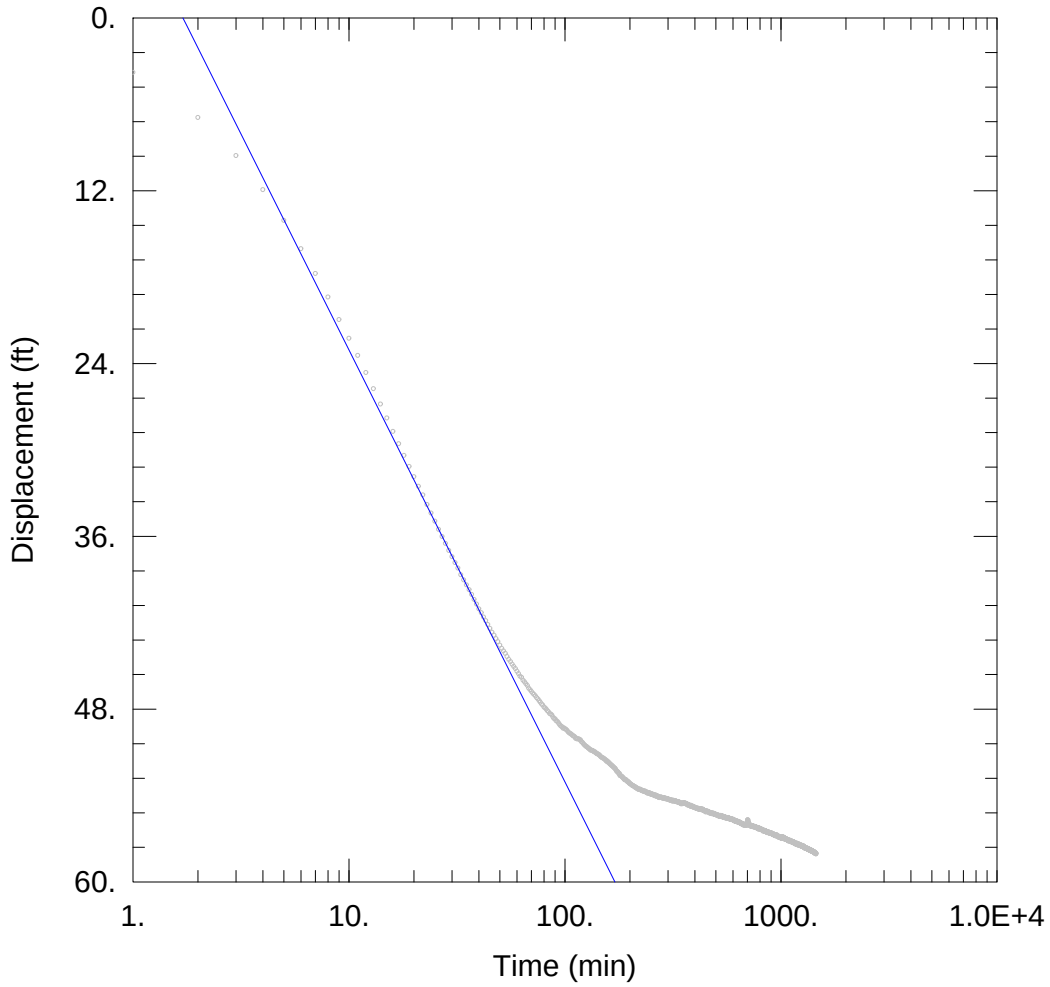
Observation Wells

Well Name	X (ft)	Y (ft)
◦ Well No. 3	0	0

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob

T = 64.96 ft^2/day K = 0.36 ft/day



WELL TEST ANALYSIS

Data Set: \...\OW 4.aqt
Date: 07/23/20 Time: 15:22:46

PROJECT INFORMATION

Company: Wet Rock Groundwater Services
Client: Lone Star Land Partners, LLC
Location: Blanco County
Test Well: Well No. 3
Test Date: 6-17-20

AQUIFER DATA

Saturated Thickness: 182. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well No. 3	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
Well No. 4	240	0

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob

T = 15.36 ft^2/day S = 1.633E-5

Aquifer Test

Well No. 5

Red Oak Mountain Well No. 5 - Aquifer Test (June 22, 2020)

Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW Well No. 5 Temperature (F)	PW Well No. 5 Water Level (ft bgs)	PW Well No. 5 Water Level (ft MSL)	PW Well No. 5 Drawdown (ft)	PW Well No. 5 Pump Rate (gpm)	PW Well No. 5 Specific Capacity (gpm/ft)	Comments	OW Well No. 4 Water Level (ft MSL)	OW Well No. 4 Drawdown (ft)
6/22/20 10:35 AM	0		73.16	345.98	1,380.02	0.00			Pump Start	1,381.59	0.00
6/22/20 10:36 AM	1		72.92	348.90	1,377.10	2.92	17	5.82	Meter: 731,415.8 gallons	1,381.61	-0.02
6/22/20 10:37 AM	2		72.65	349.15	1,376.85	3.17	25	7.89		1,381.60	-0.01
6/22/20 10:38 AM	3		72.49	349.48	1,376.52	3.50	24	6.85		1,381.56	0.03
6/22/20 10:39 AM	4		72.36	349.57	1,376.43	3.59	24	6.69		1,381.48	0.11
6/22/20 10:40 AM	5		72.28	349.82	1,376.19	3.83	24	6.26		1,381.42	0.17
6/22/20 10:41 AM	6		72.23	349.96	1,376.04	3.98	24	6.03		1,381.34	0.25
6/22/20 10:42 AM	7		72.14	349.97	1,376.03	3.99	24	6.02		1,381.38	0.21
6/22/20 10:43 AM	8		72.11	350.16	1,375.84	4.18	24	5.74		1,381.31	0.28
6/22/20 10:44 AM	9		72.05	350.38	1,375.62	4.40	24	5.45		1,381.27	0.32
6/22/20 10:45 AM	10		72.03	350.43	1,375.58	4.44	24	5.40		1,381.16	0.43
6/22/20 10:46 AM	11		71.98	350.38	1,375.62	4.40	24	5.46		1,381.10	0.49
6/22/20 10:47 AM	12		72.00	350.55	1,375.45	4.57	24	5.26		1,381.08	0.51
6/22/20 10:48 AM	13		71.96	350.70	1,375.30	4.71	24	5.09		1,381.06	0.53
6/22/20 10:49 AM	14		71.90	350.73	1,375.27	4.75	24	5.05		1,381.01	0.58
6/22/20 10:50 AM	15		71.92	350.83	1,375.17	4.85	24	4.95		1,380.94	0.65
6/22/20 10:55 AM	20		71.86	351.14	1,374.86	5.15	24	4.66		1,380.68	0.91
6/22/20 11:00 AM	25		71.90	351.48	1,374.53	5.49	24	4.37	pH: 7.15/ EC: 3.42	1,380.46	1.13
6/22/20 11:05 AM	30		71.81	351.55	1,374.45	5.57	24	4.31	pH: 7.11/ EC: 3.45	1,380.24	1.35
6/22/20 11:10 AM	35		71.79	351.81	1,374.19	5.83	24	4.12	pH: 7.13/ EC: 3.39	1,380.07	1.52
6/22/20 11:15 AM	40		71.84	351.93	1,374.07	5.95	24	4.03	pH: 7.03/ EC: 3.40	1,379.90	1.69
6/22/20 11:20 AM	45		71.77	352.15	1,373.85	6.17	24	3.89	pH: 7.04/ EC: 3.40	1,379.70	1.89
6/22/20 11:35 AM	60		71.83	352.59	1,373.41	6.61	24	3.63	pH: 7.05/ EC: 3.43	1,379.24	2.35
6/22/20 11:50 AM	75		71.82	353.13	1,372.87	7.15	24	3.36	pH: 7.04/ EC: 3.39	1,378.85	2.74
6/22/20 12:05 PM	90		71.80	353.42	1,372.58	7.43	24	3.23	pH: 7.02/ EC: 3.38	1,378.47	3.12
6/22/20 12:20 PM	105		71.85	353.66	1,372.34	7.68	24	3.12	pH: 7.06/ EC: 3.38	1,378.18	3.41
6/22/20 12:35 PM	120		71.81	353.89	1,372.11	7.90	24	3.04	pH: 7.01/ EC: 3.39	1,377.91	3.68
6/22/20 1:05 PM	150		71.83	354.49	1,371.51	8.51	24	2.82	pH: 7.00/ EC: 3.34	1,377.33	4.26
6/22/20 1:35 PM	180		71.82	354.98	1,371.02	9.00	24	2.67	pH: 7.01/ EC: 3.35	1,376.86	4.73
6/22/20 2:05 PM	210		71.81	355.59	1,370.41	9.61				1,376.43	5.16
6/22/20 2:35 PM	240		71.78	355.94	1,370.06	9.96				1,376.05	5.54
6/22/20 3:35 PM	300		71.81	356.55	1,369.45	10.57				1,375.33	6.26
6/22/20 4:35 PM	360		71.76	357.15	1,368.85	11.17				1,374.71	6.88
6/22/20 5:35 PM	420		71.77	357.70	1,368.30	11.72				1,374.18	7.41
6/22/20 6:35 PM	480		71.81	358.12	1,367.88	12.14				1,373.71	7.88

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4 inches Horsepower = 5 HP
MSL = Mean Sea Level Pump Setting = 480 ft EC=Electrical conductivity (mS/cm)

Red Oak Mountain Well No. 5 - Aquifer Test (June 22, 2020)

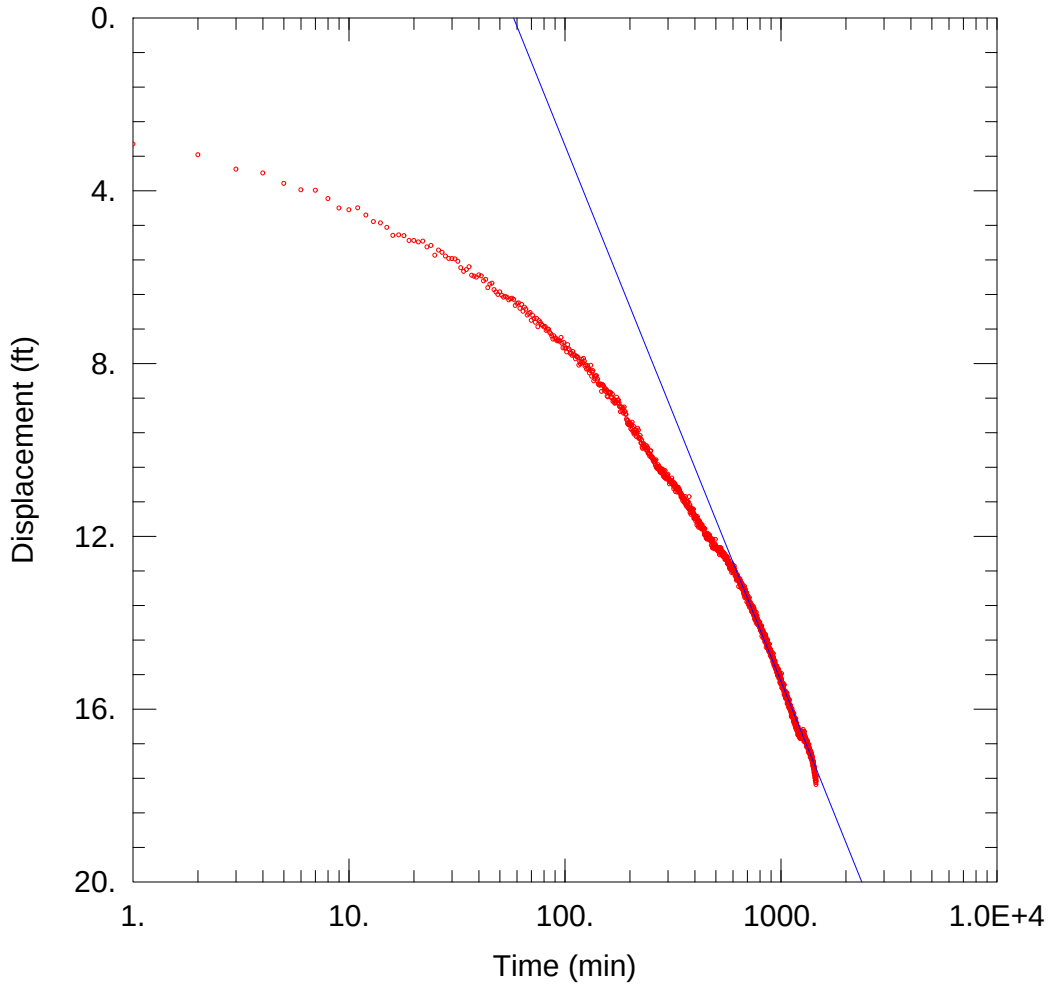
Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW Well No. 5 Temperature (F)	PW Well No. 5 Water Level (ft bgs)	PW Well No. 5 Water Level (ft MSL)	PW Well No. 5 Drawdown (ft)	PW Well No. 5 Pump Rate (gpm)	PW Well No. 5 Specific Capacity (gpm/ft)	Comments	OW Well No. 4 Water Level (ft MSL)	OW Well No. 4 Drawdown (ft)
6/22/20 7:35 PM	540		71.77	358.45	1,367.55	12.47				1,373.22	8.37
6/22/20 8:35 PM	600		71.77	358.81	1,367.19	12.83				1,372.80	8.79
6/22/20 9:35 PM	660		71.78	359.17	1,366.83	13.19				1,372.40	9.19
6/22/20 10:35 PM	720		71.80	359.56	1,366.44	13.57				1,371.98	9.61
6/22/20 11:35 PM	780		71.77	359.92	1,366.08	13.94				1,371.55	10.04
6/23/20 12:35 AM	840		71.77	360.36	1,365.64	14.38				1,371.17	10.42
6/23/20 1:35 AM	900		71.76	360.70	1,365.30	14.72				1,370.84	10.75
6/23/20 2:35 AM	960		71.77	361.10	1,364.90	15.12				1,370.46	11.13
6/23/20 3:35 AM	1,020		71.78	361.41	1,364.59	15.43				1,370.07	11.52
6/23/20 4:35 AM	1,080		71.80	361.81	1,364.19	15.83				1,369.80	11.79
6/23/20 5:35 AM	1,140		71.77	362.06	1,363.94	16.08				1,369.53	12.06
6/23/20 6:35 AM	1,200		71.81	362.48	1,363.52	16.49				1,369.23	12.36
6/23/20 7:35 AM	1,260		71.79	362.51	1,363.49	16.53				1,368.99	12.60
6/23/20 8:35 AM	1,320		71.78	362.71	1,363.29	16.73				1,368.69	12.91
6/23/20 9:35 AM	1,380		71.73	363.00	1,363.00	17.02				1,368.40	13.19
6/23/20 10:35 AM	1,440		71.76	363.54	1,362.46	17.56				1,368.09	13.50
6/23/20 10:52 AM	1,457	0	71.74	363.54	1,362.46	17.56	24	1.37	Pump Stop	1,368.03	13.57
6/23/20 10:53 AM	1,458	1	71.76	360.97	1,365.03	14.99			Meter: 766,127.6 gallons	1,368.02	13.57
6/23/20 10:54 AM	1,459	2	71.75	360.38	1,365.62	14.40			Avg. Pump Rate: 23.82	1,368.03	13.56
6/23/20 10:55 AM	1,460	3	71.75	360.12	1,365.88	14.14				1,368.07	13.52
6/23/20 10:56 AM	1,461	4	71.97	359.99	1,366.01	14.01				1,368.07	13.52
6/23/20 10:57 AM	1,462	5	72.19	359.79	1,366.21	13.81				1,368.12	13.47
6/23/20 10:58 AM	1,463	6	72.39	359.77	1,366.23	13.79				1,368.17	13.42
6/23/20 10:59 AM	1,464	7	72.54	359.53	1,366.47	13.54				1,368.16	13.43
6/23/20 11:00 AM	1,465	8	72.66	359.41	1,366.60	13.42				1,368.23	13.36
6/23/20 11:01 AM	1,466	9	72.80	359.40	1,366.60	13.42				1,368.28	13.31
6/23/20 11:02 AM	1,467	10	72.86	359.27	1,366.73	13.29				1,368.32	13.27
6/23/20 11:03 AM	1,468	11	72.89	359.21	1,366.79	13.23				1,368.35	13.24
6/23/20 11:04 AM	1,469	12	72.88	359.08	1,366.92	13.10				1,368.42	13.17
6/23/20 11:05 AM	1,470	13	72.89	359.02	1,366.98	13.04				1,368.42	13.17
6/23/20 11:06 AM	1,471	14	72.86	359.06	1,366.94	13.08				1,368.49	13.10
6/23/20 11:07 AM	1,472	15	72.79	358.91	1,367.09	12.93				1,368.52	13.07
6/23/20 11:12 AM	1,477	20	72.53	358.75	1,367.26	12.76				1,368.73	12.87
6/23/20 11:17 AM	1,482	25	72.37	358.58	1,367.42	12.60				1,368.90	12.69
6/23/20 11:22 AM	1,487	30	72.26	358.25	1,367.75	12.27				1,369.04	12.55

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4 inches Horsepower = 5 HP
MSL = Mean Sea Level Pump Setting = 480 ft EC=Electrical conductivity (mS/cm)

Red Oak Mountain Well No. 5 - Aquifer Test (June 22, 2020)

Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW Well No. 5 Temperature (F)	PW Well No. 5 Water Level (ft bgs)	PW Well No. 5 Water Level (ft MSL)	PW Well No. 5 Drawdown (ft)	PW Well No. 5 Pump Rate (gpm)	PW Well No. 5 Specific Capacity (gpm/ft)	Comments	OW Well No. 4 Water Level (ft MSL)	OW Well No. 4 Drawdown (ft)
6/23/20 11:27 AM	1,492	35	72.25	358.18	1,367.82	12.20				1,369.21	12.38
6/23/20 11:32 AM	1,497	40	72.24	358.16	1,367.84	12.18				1,369.32	12.27
6/23/20 11:37 AM	1,502	45	72.29	358.08	1,367.92	12.10				1,369.45	12.14
6/23/20 11:52 AM	1,517	60	72.15	357.89	1,368.11	11.90				1,369.74	11.85
6/23/20 12:07 PM	1,532	75	72.03	357.78	1,368.22	11.80				1,369.95	11.64
6/23/20 12:22 PM	1,547	90	71.97	357.71	1,368.30	11.72				1,370.11	11.48
6/23/20 12:37 PM	1,562	105	71.94	357.79	1,368.21	11.81				1,370.23	11.36
6/23/20 12:52 PM	1,577	120	71.92	357.72	1,368.28	11.73				1,370.37	11.22
6/23/20 1:22 PM	1,607	150	71.86	357.59	1,368.42	11.60				1,370.66	10.93
6/23/20 1:52 PM	1,637	180	71.87	357.29	1,368.71	11.30				1,370.87	10.72
6/23/20 2:22 PM	1,667	210	71.87	357.03	1,368.97	11.05				1,371.24	10.35
6/23/20 2:52 PM	1,697	240	71.86	356.82	1,369.18	10.84				1,371.52	10.07
6/23/20 3:52 PM	1,757	300	71.85	356.30	1,369.71	10.31				1,372.05	9.54
6/23/20 4:52 PM	1,817	360	71.82	355.68	1,370.32	9.70				1,372.53	9.06
6/23/20 5:52 PM	1,877	420	71.79	355.06	1,370.94	9.08				1,372.95	8.64
6/23/20 6:52 PM	1,937	480	71.84	354.46	1,371.54	8.48				1,373.33	8.26
6/23/20 7:52 PM	1,997	540	71.83	353.79	1,372.21	7.81				1,373.70	7.89
6/23/20 8:52 PM	2,057	600	71.82	353.15	1,372.85	7.17				1,373.99	7.60
6/23/20 9:52 PM	2,117	660	71.78	352.83	1,373.17	6.84				1,374.29	7.30
6/23/20 10:52 PM	2,177	720	71.80	352.62	1,373.38	6.64				1,374.55	7.04
6/23/20 11:52 PM	2,237	780	71.84	352.27	1,373.73	6.29				1,374.81	6.78
6/24/20 12:52 AM	2,297	840	71.84	352.07	1,373.93	6.09				1,374.97	6.62
6/24/20 1:52 AM	2,357	900	71.80	351.77	1,374.23	5.79				1,375.17	6.42
6/24/20 2:52 AM	2,417	960	71.84	351.67	1,374.33	5.69				1,375.35	6.24
6/24/20 3:52 AM	2,477	1,020	71.82	351.43	1,374.58	5.44				1,375.55	6.04
6/24/20 4:52 AM	2,537	1,080	71.82	351.26	1,374.74	5.28				1,375.71	5.88
6/24/20 5:52 AM	2,597	1,140	71.78	351.11	1,374.89	5.12				1,375.86	5.73
6/24/20 6:52 AM	2,657	1,200	71.82	350.88	1,375.12	4.90				1,376.07	5.52
6/24/20 7:52 AM	2,717	1,260	71.83	350.95	1,375.05	4.97				1,376.20	5.39
6/24/20 8:52 AM	2,777	1,320	71.85	350.92	1,375.08	4.94				1,376.38	5.21
6/24/20 9:52 AM	2,837	1,380	71.88	350.93	1,375.07	4.95				1,376.51	5.08
6/24/20 10:52 AM	2,897	1,440	71.87	351.03	1,374.97	5.05				1,376.65	4.94

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4 inches Horsepower = 5 HP
MSL = Mean Sea Level Pump Setting = 480 ft EC=Electrical conductivity (mS/cm)



WELL TEST ANALYSIS

Data Set: \...\Well No. 5 PW.aqt
Date: 07/20/20 Time: 13:06:41

PROJECT INFORMATION

Company: WRGS
Client: Lone Star Land Partners
Project: 083-001-20
Location: Blanco County
Test Well: Well No. 5
Test Date: 6-22-20

AQUIFER DATA

Saturated Thickness: 179. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well No. 5	0	0

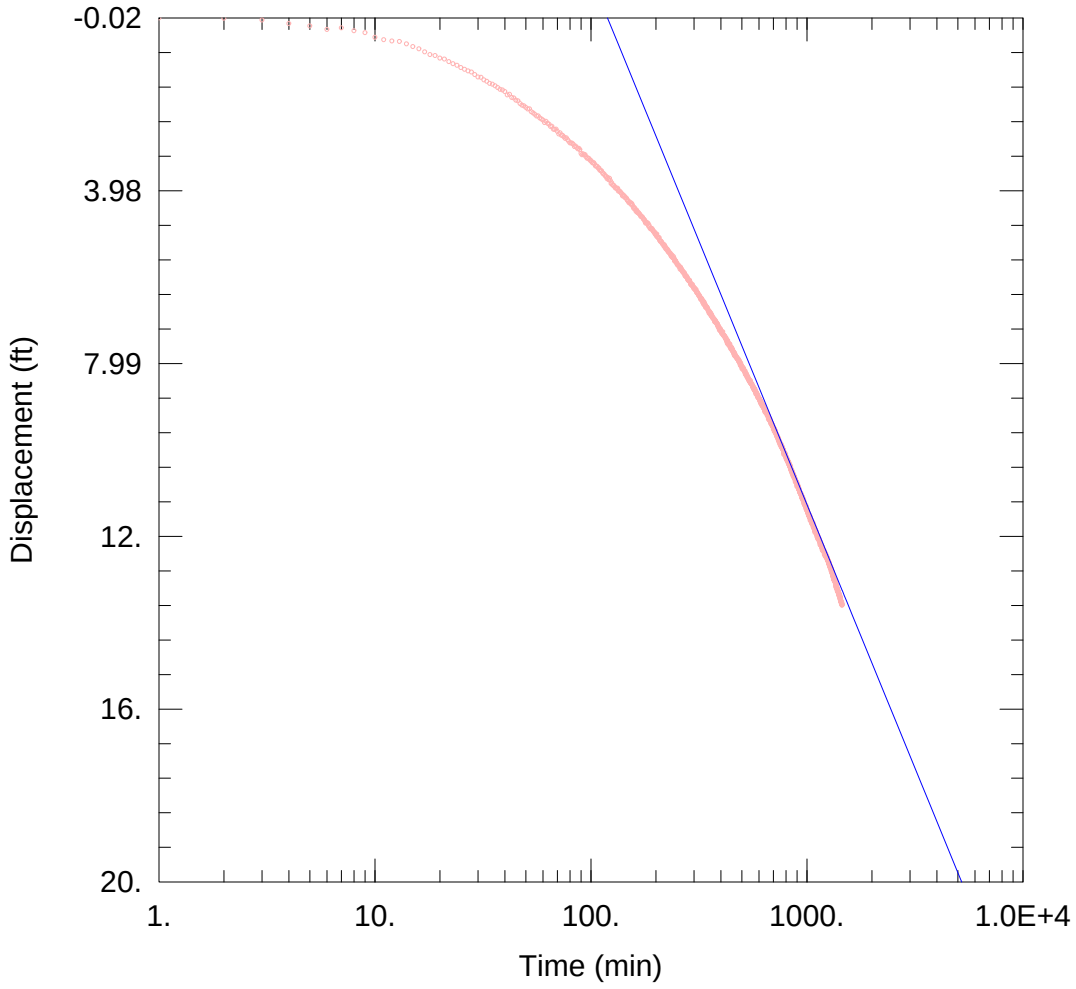
Observation Wells

Well Name	X (ft)	Y (ft)
◦ Well No. 5	0	0

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob

T = 68.24 ft^2/day K = 0.38 ft/day



WELL TEST ANALYSIS

Data Set: \...\Well No. 4 OW.aqt
Date: 07/20/20 Time: 13:07:36

PROJECT INFORMATION

Company: WRGS
Client: Lone Star Land Partners
Project: 083-001-20
Location: Blanco County
Test Well: Well No. 5
Test Date: 6-22-20

AQUIFER DATA

Saturated Thickness: 179. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well No. 5	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
Well No. 4	512	0

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob

T = 69.33 ft^2/day S = 4.941E-5

Aquifer Test

Well No. 8

Red Oak Mountain Well No. 8 - Aquifer Test (June 24, 2020)

Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW Well No. 8 Temperature (F)	PW Well No. 8 Water Level (ft bgs)	PW Well No. 8 Water Level (ft MSL)	PW Well No. 8 Drawdown (ft)	PW Well No. 8 Pump Rate (gpm)	PW Well No. 8 Specific Capacity (gpm/ft)	Comments	OW Well No. 7 Water Level (ft MSL)	OW Well No. 7 Drawdown (ft)
6/24/20 12:06 PM	0		72.42	458.56	1,373.44	0.00			Pump Start	1,374.93	0.00
6/24/20 12:07 PM	1		72.16	463.77	1,368.23	5.21	12	2.30	Meter: 766,127.6 gallons	1,374.93	0.00
6/24/20 12:08 PM	2		71.85	472.02	1,359.98	13.45	12	0.89		1,374.92	0.01
6/24/20 12:09 PM	3		71.67	478.64	1,353.36	20.08	12	0.60		1,374.91	0.02
6/24/20 12:10 PM	4		71.54	484.41	1,347.60	25.84	11	0.43		1,374.88	0.05
6/24/20 12:11 PM	5		71.48	489.54	1,342.46	30.98	11	0.36		1,374.85	0.08
6/24/20 12:12 PM	6		71.38	493.89	1,338.11	35.32	11	0.31		1,374.85	0.08
6/24/20 12:13 PM	7		71.30	497.61	1,334.40	39.04	11	0.28		1,374.81	0.12
6/24/20 12:14 PM	8		71.30	500.86	1,331.14	42.30	11	0.26		1,374.80	0.12
6/24/20 12:15 PM	9		71.22	503.86	1,328.15	45.29	11	0.24		1,374.75	0.18
6/24/20 12:16 PM	10		71.24	506.57	1,325.43	48.01	11	0.23		1,374.78	0.15
6/24/20 12:17 PM	11		71.22	508.99	1,323.01	50.43	11	0.22		1,374.71	0.22
6/24/20 12:18 PM	12		71.17	511.03	1,320.97	52.47	11	0.21		1,374.72	0.21
6/24/20 12:19 PM	13		71.10	512.90	1,319.10	54.34	11	0.20		1,374.69	0.24
6/24/20 12:20 PM	14		71.13	514.63	1,317.37	56.07	11	0.20		1,374.67	0.26
6/24/20 12:21 PM	15		71.10	516.12	1,315.89	57.55	11	0.19		1,374.63	0.30
6/24/20 12:26 PM	20		71.09	521.91	1,310.09	63.35	11	0.17		1,374.56	0.37
6/24/20 12:31 PM	25		71.19	525.36	1,306.64	66.80	11	0.16	pH: 7.20/ EC: 2.37	1,374.49	0.44
6/24/20 12:36 PM	30		71.34	527.75	1,304.25	69.19	11	0.16	pH: 7.15/ EC: 2.46	1,374.42	0.51
6/24/20 12:41 PM	35		71.36	529.12	1,302.88	70.56	11	0.16		1,374.38	0.55
6/24/20 12:46 PM	40		71.47	530.12	1,301.88	71.56	11	0.15	pH: 7.27/ EC: 2.56	1,374.32	0.61
6/24/20 12:51 PM	45		71.51	530.74	1,301.26	72.18	11	0.15	pH: 7.22/ EC: 2.59	1,374.24	0.69
6/24/20 1:06 PM	60		71.56	531.95	1,300.05	73.39	11	0.15	pH: 7.26/ EC: 2.70	1,374.13	0.79
6/24/20 1:21 PM	75		71.60	532.79	1,299.21	74.23	11	0.15	pH: 7.12/ EC: 2.78	1,373.97	0.95
6/24/20 1:36 PM	90		71.72	533.19	1,298.81	74.63	11	0.15	pH: 7.08/ EC: 2.85	1,373.89	1.04
6/24/20 1:51 PM	105		71.68	533.67	1,298.34	75.10	11	0.15	pH: 7.14/ EC: 2.90	1,373.79	1.14
6/24/20 2:06 PM	120		71.72	533.96	1,298.04	75.40	11	0.15	pH: 7.03/ EC: 2.94	1,373.65	1.27
6/24/20 2:36 PM	150		71.71	534.38	1,297.62	75.82	11	0.15	pH: 7.08/ EC: 3.01	1,373.49	1.44
6/24/20 3:06 PM	180		71.74	534.74	1,297.26	76.18	11	0.14	pH: 7.03/ EC: 3.04	1,373.35	1.58
6/24/20 3:36 PM	210		71.72	534.95	1,297.05	76.39	11	0.14	pH: 6.95/ EC: 3.10	1,373.19	1.74
6/24/20 4:06 PM	240		71.76	535.29	1,296.71	76.73				1,373.10	1.82
6/24/20 5:06 PM	300		71.75	535.46	1,296.54	76.90				1,372.90	2.03
6/24/20 6:06 PM	360		71.77	535.57	1,296.43	77.01				1,372.76	2.17
6/24/20 7:06 PM	420		71.79	535.65	1,296.35	77.09				1,372.61	2.31
6/24/20 8:06 PM	480		71.81	535.58	1,296.43	77.01				1,372.51	2.42

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4 inches Horsepower = 3 HP
MSL = Mean Sea Level Pump Setting = 600 ft EC=Electrical conductivity (mS/cm)

Red Oak Mountain Well No. 8 - Aquifer Test (June 24, 2020)

Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW Well No. 8 Temperature (F)	PW Well No. 8 Water Level (ft bgs)	PW Well No. 8 Water Level (ft MSL)	PW Well No. 8 Drawdown (ft)	PW Well No. 8 Pump Rate (gpm)	PW Well No. 8 Specific Capacity (gpm/ft)	Comments	OW Well No. 7 Water Level (ft MSL)	OW Well No. 7 Drawdown (ft)
6/24/20 9:06 PM	540		71.81	535.78	1,296.22	77.22				1,372.37	2.55
6/24/20 10:06 PM	600		71.83	535.97	1,296.03	77.41				1,372.26	2.66
6/24/20 11:06 PM	660		71.82	536.08	1,295.92	77.52				1,372.21	2.72
6/25/20 12:06 AM	720		71.81	536.30	1,295.70	77.74				1,372.08	2.85
6/25/20 1:06 AM	780		71.88	536.47	1,295.53	77.91				1,372.02	2.91
6/25/20 2:06 AM	840		71.84	536.47	1,295.53	77.91				1,371.88	3.04
6/25/20 3:06 AM	900		71.88	536.63	1,295.37	78.07				1,371.79	3.14
6/25/20 4:06 AM	960		71.88	536.69	1,295.31	78.13				1,371.71	3.22
6/25/20 5:06 AM	1,020		71.90	536.81	1,295.19	78.25				1,371.60	3.33
6/25/20 6:06 AM	1,080		71.89	536.99	1,295.01	78.43				1,371.52	3.41
6/25/20 7:06 AM	1,140		71.86	537.08	1,294.92	78.52				1,371.48	3.45
6/25/20 8:06 AM	1,200		71.90	537.05	1,294.95	78.49				1,371.42	3.51
6/25/20 9:06 AM	1,260		71.87	537.42	1,294.58	78.86				1,371.38	3.55
6/25/20 10:06 AM	1,320		71.91	537.68	1,294.32	79.12				1,371.29	3.63
6/25/20 11:06 AM	1,380		71.92	537.57	1,294.43	79.01				1,371.19	3.74
6/25/20 12:06 PM	1,440		71.89	537.64	1,294.36	79.07				1,371.13	3.79
6/25/20 12:18 PM	1,452	0	71.88	537.62	1,294.38	79.06	11	0.14	Pump Stop	1,371.10	3.83
6/25/20 12:19 PM	1,453	1	71.92	533.72	1,298.29	75.15			Meter: 781,597.8 gallons	1,371.11	3.82
6/25/20 12:20 PM	1,454	2	72.03	524.93	1,307.08	66.36			Avg. Pump Rate: 10.65	1,371.13	3.80
6/25/20 12:21 PM	1,455	3	72.17	517.06	1,314.94	58.50				1,371.10	3.83
6/25/20 12:22 PM	1,456	4	72.24	509.95	1,322.05	51.39				1,371.11	3.82
6/25/20 12:23 PM	1,457	5	72.25	503.46	1,328.54	44.90				1,371.11	3.82
6/25/20 12:24 PM	1,458	6	72.21	497.88	1,334.12	39.31				1,371.12	3.81
6/25/20 12:25 PM	1,459	7	72.22	492.92	1,339.08	34.36				1,371.15	3.78
6/25/20 12:26 PM	1,460	8	72.23	488.44	1,343.56	29.88				1,371.14	3.79
6/25/20 12:27 PM	1,461	9	72.19	484.39	1,347.61	25.82				1,371.15	3.77
6/25/20 12:28 PM	1,462	10	72.19	480.89	1,351.11	22.33				1,371.15	3.78
6/25/20 12:29 PM	1,463	11	72.13	477.90	1,354.10	19.34				1,371.20	3.73
6/25/20 12:30 PM	1,464	12	72.07	475.46	1,356.54	16.90				1,371.21	3.72
6/25/20 12:31 PM	1,465	13	72.07	473.30	1,358.70	14.74				1,371.25	3.68
6/25/20 12:32 PM	1,466	14	72.08	471.59	1,360.41	13.02				1,371.26	3.67
6/25/20 12:33 PM	1,467	15	72.08	469.97	1,362.03	11.41				1,371.26	3.67
6/25/20 12:38 PM	1,472	20	72.01	465.50	1,366.51	6.93				1,371.38	3.55
6/25/20 12:43 PM	1,477	25	71.98	464.33	1,367.67	5.77				1,371.47	3.45
6/25/20 12:48 PM	1,482	30	72.02	463.83	1,368.17	5.26				1,371.56	3.37

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4 inches Horsepower = 3 HP
MSL = Mean Sea Level Pump Setting = 600 ft EC=Electrical conductivity (mS/cm)

Red Oak Mountain Well No. 8 - Aquifer Test (June 24, 2020)

Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW Well No. 8 Temperature (F)	PW Well No. 8 Water Level (ft bgs)	PW Well No. 8 Water Level (ft MSL)	PW Well No. 8 Drawdown (ft)	PW Well No. 8 Pump Rate (gpm)	PW Well No. 8 Specific Capacity (gpm/ft)	Comments	OW Well No. 7 Water Level (ft MSL)	OW Well No. 7 Drawdown (ft)
6/25/20 12:53 PM	1,487	35	72.11	463.48	1,368.52	4.91				1,371.62	3.31
6/25/20 12:58 PM	1,492	40	72.09	463.37	1,368.64	4.80				1,371.69	3.24
6/25/20 1:03 PM	1,497	45	72.10	463.19	1,368.81	4.62				1,371.77	3.15
6/25/20 1:18 PM	1,512	60	72.11	462.79	1,369.21	4.23				1,371.88	3.04
6/25/20 1:33 PM	1,527	75	72.04	462.59	1,369.41	4.03				1,372.03	2.90
6/25/20 1:48 PM	1,542	90	72.00	462.39	1,369.61	3.83				1,372.11	2.82
6/25/20 2:03 PM	1,557	105	72.00	462.26	1,369.74	3.70				1,372.24	2.69
6/25/20 2:18 PM	1,572	120	71.99	461.98	1,370.02	3.42				1,372.31	2.62
6/25/20 2:48 PM	1,602	150	71.99	461.51	1,370.49	2.95				1,372.49	2.44
6/25/20 3:18 PM	1,632	180	71.96	461.60	1,370.40	3.03				1,372.63	2.30
6/25/20 3:48 PM	1,662	210	71.96	461.32	1,370.68	2.75				1,372.78	2.15
6/25/20 4:18 PM	1,692	240	71.91	461.10	1,370.90	2.53				1,372.88	2.05
6/25/20 5:18 PM	1,752	300	71.66	460.65	1,371.35	2.09				1,373.15	1.78
6/25/20 6:18 PM	1,812	360	71.46	460.58	1,371.43	2.01				1,373.33	1.60
6/25/20 7:18 PM	1,872	420	71.38	459.87	1,372.13	1.31				1,373.55	1.37
6/25/20 8:18 PM	1,932	480	71.32	459.68	1,372.32	1.12				1,373.78	1.15
6/25/20 9:18 PM	1,992	540	71.31	459.53	1,372.47	0.97				1,373.94	0.99
6/25/20 10:18 PM	2,052	600	71.34	459.53	1,372.47	0.97				1,374.11	0.82
6/25/20 11:18 PM	2,112	660	71.34	459.37	1,372.63	0.81				1,374.25	0.68
6/26/20 12:18 AM	2,172	720	71.30	459.22	1,372.78	0.66				1,374.45	0.48
6/26/20 1:18 AM	2,232	780	71.31	459.13	1,372.87	0.56				1,374.54	0.39
6/26/20 2:18 AM	2,292	840	71.30	458.97	1,373.03	0.41				1,374.67	0.25
6/26/20 3:18 AM	2,352	900	71.30	458.90	1,373.11	0.33				1,374.75	0.18
6/26/20 4:18 AM	2,412	960	71.26	458.68	1,373.32	0.12				1,374.89	0.04
6/26/20 5:18 AM	2,472	1,020	71.28	458.72	1,373.28	0.16				1,374.97	-0.05
6/26/20 6:18 AM	2,532	1,080	71.25	458.64	1,373.36	0.08				1,375.09	-0.16
6/26/20 7:18 AM	2,592	1,140	71.26	458.49	1,373.51	-0.07				1,375.21	-0.28
6/26/20 8:18 AM	2,652	1,200	71.24	458.47	1,373.53	-0.09				1,375.33	-0.40
6/26/20 9:18 AM	2,712	1,260	71.24	458.49	1,373.51	-0.07				1,375.40	-0.48
6/26/20 10:18 AM	2,772	1,320	71.22	458.31	1,373.70	-0.26				1,375.52	-0.60
6/26/20 11:18 AM	2,832	1,380	71.25	458.15	1,373.85	-0.41				1,375.60	-0.68
6/26/20 12:18 PM	2,892	1,440	71.22	457.94	1,374.06	-0.62				1,375.67	-0.74
6/26/20 1:18 PM	2,952	1,500	71.21	457.87	1,374.13	-0.70				1,375.73	-0.81

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4 inches Horsepower = 3 HP
MSL = Mean Sea Level Pump Setting = 600 ft EC=Electrical conductivity (mS/cm)

Red Oak Mountain Well No. 8 - Aquifer Test (June 24, 2020)

Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW Well No. 8 Temperature (F)	PW Well No. 8 Water Level (ft bgs)	PW Well No. 8 Water Level (ft MSL)	PW Well No. 8 Drawdown (ft)	PW Well No. 8 Pump Rate (gpm)	PW Well No. 8 Specific Capacity (gpm/ft)	Comments	OW Well No. 7 Water Level (ft MSL)	OW Well No. 7 Drawdown (ft)
6/26/20 2:18 PM	3,012	1,560	71.22	458.02	1,373.98	-0.54				1,375.83	-0.90
6/26/20 3:18 PM	3,072	1,620	71.19	457.95	1,374.05	-0.61				1,375.86	-0.94
6/26/20 4:18 PM	3,132	1,680	71.19	458.16	1,373.84	-0.40				1,375.93	-1.00
6/26/20 5:18 PM	3,192	1,740	71.17	457.99	1,374.01	-0.57				1,375.98	-1.06
6/26/20 6:18 PM	3,252	1,800	71.19	457.65	1,374.35	-0.91				1,376.06	-1.13
6/26/20 7:18 PM	3,312	1,860	71.21	457.58	1,374.42	-0.98				1,376.14	-1.21
6/26/20 8:18 PM	3,372	1,920	71.17	457.32	1,374.68	-1.24				1,376.19	-1.26
6/26/20 9:18 PM	3,432	1,980	71.18	457.24	1,374.76	-1.32				1,376.29	-1.37
6/26/20 10:18 PM	3,492	2,040	71.15	457.12	1,374.88	-1.44				1,376.40	-1.47
6/26/20 11:18 PM	3,552	2,100	71.15	457.07	1,374.93	-1.49				1,376.50	-1.57
6/27/20 12:18 AM	3,612	2,160	71.17	456.99	1,375.01	-1.57				1,376.56	-1.64
6/27/20 1:18 AM	3,672	2,220	71.19	456.83	1,375.18	-1.74				1,376.62	-1.69
6/27/20 2:18 AM	3,732	2,280	71.21	456.78	1,375.22	-1.78				1,376.68	-1.76
6/27/20 3:18 AM	3,792	2,340	71.18	456.76	1,375.24	-1.80				1,376.74	-1.81
6/27/20 4:18 AM	3,852	2,400	71.16	456.72	1,375.29	-1.85				1,376.80	-1.87
6/27/20 5:18 AM	3,912	2,460	71.17	456.76	1,375.24	-1.80				1,376.80	-1.88
6/27/20 6:18 AM	3,972	2,520	71.13	456.65	1,375.35	-1.91				1,376.90	-1.98
6/27/20 7:18 AM	4,032	2,580	71.13	456.50	1,375.50	-2.06				1,376.96	-2.04
6/27/20 8:18 AM	4,092	2,640	71.17	456.49	1,375.51	-2.08				1,377.01	-2.08
6/27/20 9:18 AM	4,152	2,700	71.13	456.76	1,375.24	-1.80				1,377.10	-2.17
6/27/20 10:18 AM	4,212	2,760	71.18	456.71	1,375.30	-1.86				1,377.14	-2.22
6/27/20 11:18 AM	4,272	2,820	71.15	456.82	1,375.18	-1.74				1,377.22	-2.29
6/27/20 12:18 PM	4,332	2,880	71.16	456.76	1,375.24	-1.81				1,377.30	-2.37
6/27/20 1:18 PM	4,392	2,940	71.13	456.62	1,375.38	-1.94				1,377.32	-2.39
6/27/20 2:18 PM	4,452	3,000	71.17	456.54	1,375.46	-2.02				1,377.34	-2.41
6/27/20 3:18 PM	4,512	3,060	71.17	456.52	1,375.48	-2.04				1,377.38	-2.46
6/27/20 4:18 PM	4,572	3,120	71.14	456.08	1,375.92	-2.48				1,377.41	-2.48
6/27/20 5:18 PM	4,632	3,180	71.11	456.01	1,376.00	-2.56				1,377.44	-2.51
6/27/20 6:18 PM	4,692	3,240	71.11	456.05	1,375.95	-2.51				1,377.50	-2.58
6/27/20 7:18 PM	4,752	3,300	71.14	455.69	1,376.31	-2.87				1,377.54	-2.61

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4 inches Horsepower = 3 HP
MSL = Mean Sea Level Pump Setting = 600 ft EC=Electrical conductivity (mS/cm)

Red Oak Mountain Well No. 8 - Aquifer Test (June 24, 2020)

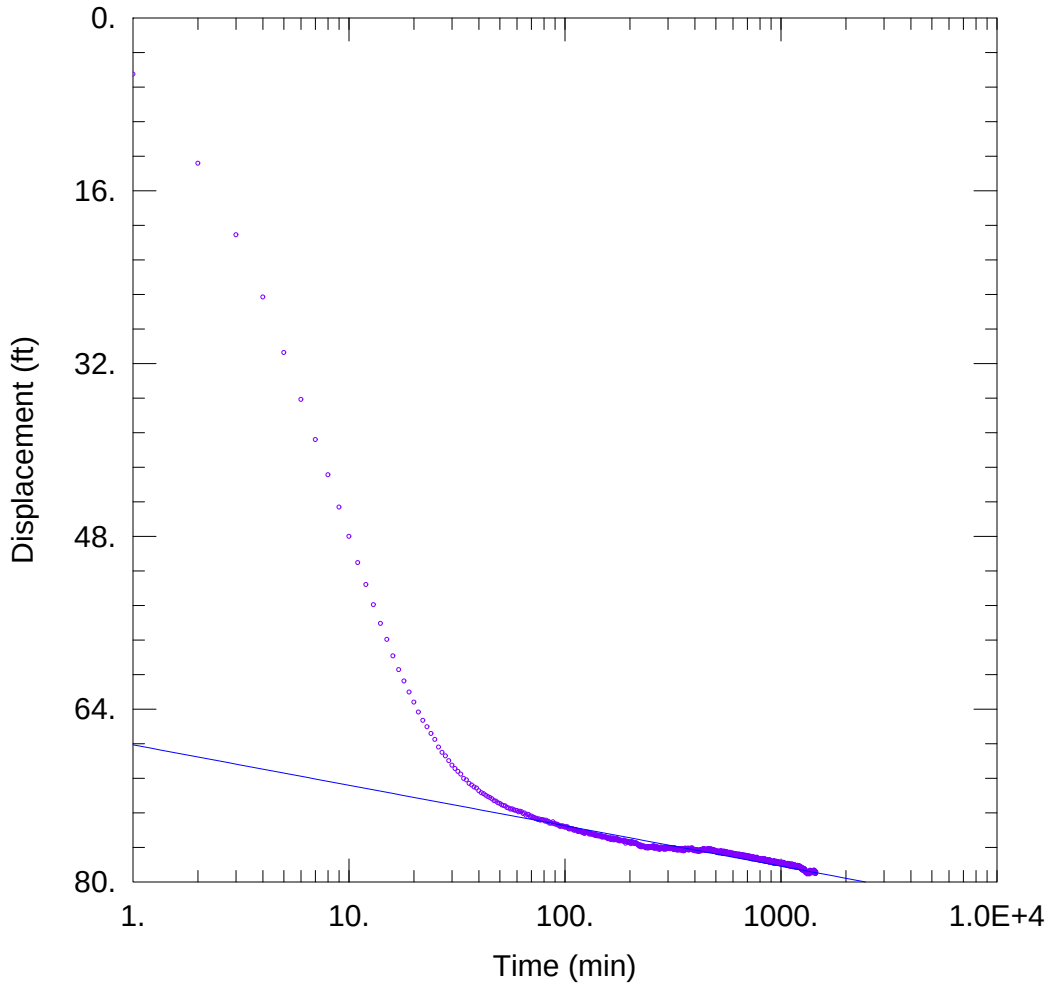
Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW Well No. 8 Temperature (F)	PW Well No. 8 Water Level (ft bgs)	PW Well No. 8 Water Level (ft MSL)	PW Well No. 8 Drawdown (ft)	PW Well No. 8 Pump Rate (gpm)	PW Well No. 8 Specific Capacity (gpm/ft)	Comments	OW Well No. 7 Water Level (ft MSL)	OW Well No. 7 Drawdown (ft)
6/27/20 8:18 PM	4,812	3,360	71.15	455.44	1,376.56	-3.12				1,377.57	-2.64
6/27/20 9:18 PM	4,872	3,420	71.14	455.38	1,376.62	-3.18				1,377.65	-2.72
6/27/20 10:18 PM	4,932	3,480	71.15	455.34	1,376.66	-3.23				1,377.72	-2.79
6/27/20 11:18 PM	4,992	3,540	71.16	455.31	1,376.69	-3.25				1,377.79	-2.86
6/28/20 12:18 AM	5,052	3,600	71.13	455.18	1,376.82	-3.39				1,377.86	-2.94
6/28/20 1:18 AM	5,112	3,660	71.17	455.15	1,376.85	-3.41				1,377.89	-2.96
6/28/20 2:18 AM	5,172	3,720	71.12	455.11	1,376.89	-3.45				1,377.96	-3.03
6/28/20 3:18 AM	5,232	3,780	71.11	455.12	1,376.88	-3.44				1,377.99	-3.07
6/28/20 4:18 AM	5,292	3,840	71.10	454.96	1,377.05	-3.61				1,378.00	-3.07
6/28/20 5:18 AM	5,352	3,900	71.13	455.08	1,376.92	-3.49				1,378.01	-3.08
6/28/20 6:18 AM	5,412	3,960	71.13	454.96	1,377.04	-3.61				1,378.10	-3.17
6/28/20 7:18 AM	5,472	4,020	71.11	454.96	1,377.04	-3.61				1,378.18	-3.25
6/28/20 8:18 AM	5,532	4,080	71.15	454.88	1,377.12	-3.68				1,378.22	-3.29
6/28/20 9:18 AM	5,592	4,140	71.10	454.85	1,377.15	-3.71				1,378.26	-3.33
6/28/20 10:18 AM	5,652	4,200	71.11	454.86	1,377.14	-3.70				1,378.33	-3.40
6/28/20 11:18 AM	5,712	4,260	71.13	454.80	1,377.21	-3.77				1,378.39	-3.46
6/28/20 12:18 PM	5,772	4,320	71.12	454.72	1,377.29	-3.85				1,378.42	-3.50
6/28/20 1:18 PM	5,832	4,380	71.10	454.74	1,377.26	-3.82				1,378.47	-3.55
6/28/20 2:18 PM	5,892	4,440	71.11	455.07	1,376.93	-3.49				1,378.52	-3.59
6/28/20 3:18 PM	5,952	4,500	71.15	454.94	1,377.06	-3.63				1,378.57	-3.64
6/28/20 4:18 PM	6,012	4,560	71.12	455.03	1,376.97	-3.53				1,378.59	-3.66
6/28/20 5:18 PM	6,072	4,620	71.15	455.00	1,377.00	-3.56				1,378.56	-3.63
6/28/20 6:18 PM	6,132	4,680	71.08	454.72	1,377.28	-3.84				1,378.67	-3.74
6/28/20 7:18 PM	6,192	4,740	71.09	454.64	1,377.36	-3.93				1,378.66	-3.74
6/28/20 8:18 PM	6,252	4,800	71.07	454.26	1,377.74	-4.30				1,378.72	-3.79
6/28/20 9:18 PM	6,312	4,860	71.12	454.18	1,377.82	-4.38				1,378.76	-3.83
6/28/20 10:18 PM	6,372	4,920	71.10	454.21	1,377.79	-4.35				1,378.83	-3.91
6/28/20 11:18 PM	6,432	4,980	71.11	454.11	1,377.89	-4.46				1,378.90	-3.97
6/29/20 12:18 AM	6,492	5,040	71.10	454.02	1,377.99	-4.55				1,378.93	-4.00
6/29/20 1:18 AM	6,552	5,100	71.13	454.08	1,377.92	-4.48				1,379.00	-4.08

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4 inches Horsepower = 3 HP
MSL = Mean Sea Level Pump Setting = 600 ft EC=Electrical conductivity (mS/cm)

Red Oak Mountain Well No. 8 - Aquifer Test (June 24, 2020)

Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW Well No. 8 Temperature (F)	PW Well No. 8 Water Level (ft bgs)	PW Well No. 8 Water Level (ft MSL)	PW Well No. 8 Drawdown (ft)	PW Well No. 8 Pump Rate (gpm)	PW Well No. 8 Specific Capacity (gpm/ft)	Comments	OW Well No. 7 Water Level (ft MSL)	OW Well No. 7 Drawdown (ft)
6/29/20 2:18 AM	6,612	5,160	71.08	453.93	1,378.07	-4.63				1,379.02	-4.09
6/29/20 3:18 AM	6,672	5,220	71.07	453.85	1,378.15	-4.71				1,379.06	-4.14
6/29/20 4:18 AM	6,732	5,280	71.08	453.89	1,378.11	-4.67				1,379.09	-4.17
6/29/20 5:18 AM	6,792	5,340	71.08	453.86	1,378.14	-4.70				1,379.10	-4.17
6/29/20 6:18 AM	6,852	5,400	71.11	453.83	1,378.18	-4.74				1,379.18	-4.26
6/29/20 7:18 AM	6,912	5,460	71.09	453.79	1,378.21	-4.77				1,379.22	-4.29
6/29/20 8:18 AM	6,972	5,520	71.14	453.86	1,378.14	-4.71				1,379.19	-4.27
6/29/20 9:18 AM	7,032	5,580	71.07	454.00	1,378.00	-4.56				1,379.28	-4.35

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4 inches Horsepower = 3 HP
MSL = Mean Sea Level Pump Setting = 600 ft EC=Electrical conductivity (mS/cm)



WELL TEST ANALYSIS

Data Set: \...\Well No. 8 PW.aqt
Date: 07/20/20 Time: 13:09:23

PROJECT INFORMATION

Company: WRGS
Client: Lone Star Land Partners
Project: 083-001-20
Location: Blanco County
Test Well: Well No. 8
Test Date: 6-24-20

AQUIFER DATA

Saturated Thickness: 187. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well No. 8	0	0

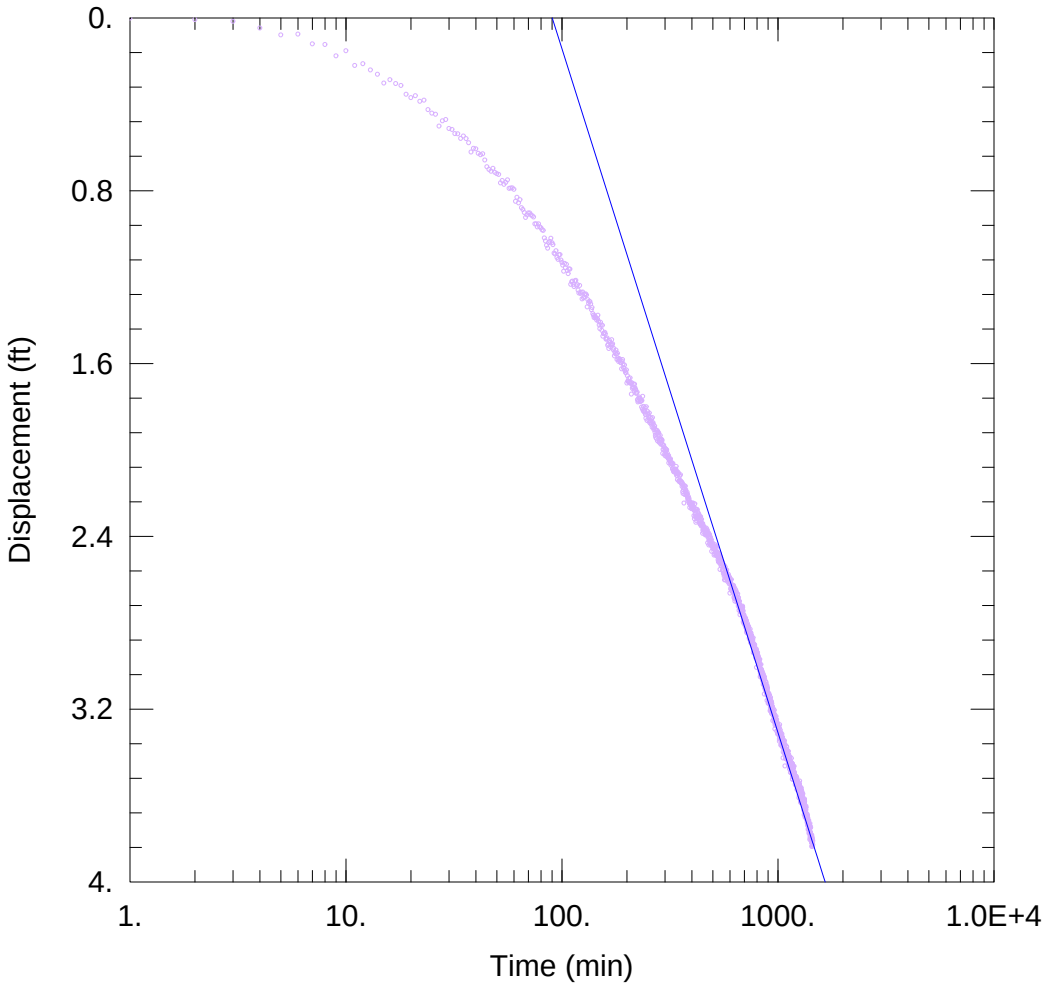
Observation Wells

Well Name	X (ft)	Y (ft)
◦ Well No. 8	0	0

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob

T = 103.7 ft^2/day K = 0.55 ft/day



WELL TEST ANALYSIS

Data Set: \...\Well No. 7 OW.aqt
Date: 07/20/20 Time: 13:10:26

PROJECT INFORMATION

Company: WRGS
Client: Lone Star Land Partners
Project: 083-001-20
Location: Blanco County
Test Well: Well No. 8
Test Date: 6-24-20

AQUIFER DATA

Saturated Thickness: 187. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well No. 8	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
Well No. 7	605	0

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob

T = 122.5 ft^2/day S = 4.709E-5

Aquifer Test

Well No. 6

Red Oak Mountain Well No. 6 - Aquifer Test (June 29, 2020)

Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW Well No. 6 Temperature (F)	PW Well No. 6 Water Level (ft bgs)	PW Well No. 6 Water Level (ft MSL)	PW Well No. 6 Drawdown (ft)	PW Well No. 6 Pump Rate (gpm)	PW Well No. 6 Specific Capacity (gpm/ft)	Comments	OW Well No. 7 Water Level (ft MSL)	OW Well No. 7 Drawdown (ft)
6/29/20 12:50 PM	0		73.26	453.00	1,377.00	0.00			Pump Start	1,379.42	0.00
6/29/20 12:51 PM	1		72.76	453.31	1,376.69	0.31	13	39.81	Meter: 781,597.74 gallons	1,379.41	0.01
6/29/20 12:52 PM	2		72.34	453.36	1,376.64	0.36	12	33.06		1,379.44	-0.02
6/29/20 12:53 PM	3		72.10	453.51	1,376.49	0.51	12	23.15		1,379.38	0.04
6/29/20 12:54 PM	4		71.85	453.49	1,376.51	0.49	12	24.24	pH: 7.2/ EC: 2.02	1,379.26	0.16
6/29/20 12:55 PM	5		71.73	453.67	1,376.33	0.67	12	17.53		1,379.21	0.21
6/29/20 12:56 PM	6		71.60	453.60	1,376.40	0.60	12	19.54		1,379.18	0.24
6/29/20 12:57 PM	7		71.55	453.73	1,376.27	0.73	12	16.05		1,379.09	0.32
6/29/20 12:58 PM	8		71.48	453.75	1,376.25	0.75	12	15.65		1,379.05	0.37
6/29/20 12:59 PM	9		71.43	453.92	1,376.08	0.92	12	12.81		1,379.03	0.39
6/29/20 1:00 PM	10		71.42	453.88	1,376.12	0.88	12	13.39	pH: 7.03/ EC: 1.98	1,378.99	0.43
6/29/20 1:01 PM	11		71.36	453.95	1,376.05	0.95				1,378.95	0.47
6/29/20 1:02 PM	12		71.40	453.98	1,376.02	0.98				1,378.94	0.47
6/29/20 1:03 PM	13		71.42	454.07	1,375.93	1.07			pH: 7.01/ EC: 2.30	1,378.89	0.53
6/29/20 1:04 PM	14		71.38	454.05	1,375.95	1.05				1,378.87	0.55
6/29/20 1:05 PM	15		71.39	454.15	1,375.85	1.15	12	10.23	pH: 7.00/ EC: 2.28	1,378.84	0.57
6/29/20 1:10 PM	20		71.41	454.23	1,375.77	1.23	12	9.55	pH: 7.10/ EC: 2.38	1,378.74	0.68
6/29/20 1:15 PM	25		71.40	454.42	1,375.58	1.42	12	8.33	pH: 6.95/ EC: 2.39	1,378.60	0.82
6/29/20 1:20 PM	30		71.44	454.56	1,375.44	1.56	12	7.55	pH: 6.92/ EC: 2.44	1,378.55	0.87
6/29/20 1:25 PM	35		71.44	454.65	1,375.35	1.65	12	7.14	pH: 6.89/ EC: 2.45	1,378.49	0.93
6/29/20 1:30 PM	40		71.41	454.65	1,375.35	1.65	12	7.14		1,378.37	1.05
6/29/20 1:35 PM	45		71.38	454.85	1,375.15	1.85	12	6.38	pH: 6.90/ EC: 2.49	1,378.31	1.11
6/29/20 1:40 PM	50		71.34	454.76	1,375.24	1.76	12	6.69		1,378.24	1.18
6/29/20 1:45 PM	55		71.37	454.98	1,375.02	1.98	12	5.96		1,378.18	1.24
6/29/20 1:50 PM	60		71.41	455.05	1,374.95	2.05	12	5.75	pH: 6.91/ EC: 2.51	1,378.15	1.27
6/29/20 2:05 PM	75		71.42	455.25	1,374.75	2.25	12	5.25	pH: 6.90/ EC: 2.56	1,377.97	1.45
6/29/20 2:20 PM	90		71.49	455.41	1,374.59	2.41	12	4.85	pH: 6.89/ EC: 2.60	1,377.80	1.62
6/29/20 2:35 PM	105		71.49	455.49	1,374.51	2.49	12	4.69		1,377.69	1.73
6/29/20 2:50 PM	120		71.57	455.58	1,374.42	2.58	12	4.54	pH: 6.85/ EC: 2.68	1,377.57	1.85
6/29/20 3:05 PM	135		71.50	455.79	1,374.21	2.79				1,377.47	1.95
6/29/20 3:20 PM	150		71.48	455.87	1,374.14	2.87	12	4.08		1,377.34	2.08
6/29/20 3:35 PM	165		71.53	455.94	1,374.06	2.94				1,377.23	2.19
6/29/20 3:50 PM	180		71.59	455.99	1,374.02	2.99	12.0	3.92		1,377.15	2.26
6/29/20 4:20 PM	210		71.58	456.06	1,373.95	3.06				1,377.00	2.42
6/29/20 4:50 PM	240		71.62	456.37	1,373.63	3.37				1,376.80	2.62

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4 inches Horsepower = 3 HP
MSL = Mean Sea Level Pump Setting = 600 ft EC=Electrical conductivity (mS/cm)

Red Oak Mountain Well No. 6 - Aquifer Test (June 29, 2020)

Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW Well No. 6 Temperature (F)	PW Well No. 6 Water Level (ft bgs)	PW Well No. 6 Water Level (ft MSL)	PW Well No. 6 Drawdown (ft)	PW Well No. 6 Pump Rate (gpm)	PW Well No. 6 Specific Capacity (gpm/ft)	Comments	OW Well No. 7 Water Level (ft MSL)	OW Well No. 7 Drawdown (ft)
6/29/20 5:50 PM	300		71.63	456.62	1,373.38	3.62				1,376.54	2.88
6/29/20 6:50 PM	360		71.63	456.90	1,373.10	3.90				1,376.25	3.17
6/29/20 7:50 PM	420		71.67	456.97	1,373.03	3.97				1,376.03	3.39
6/29/20 8:50 PM	480		71.67	457.23	1,372.77	4.23				1,375.78	3.64
6/29/20 9:50 PM	540		71.70	457.43	1,372.57	4.43				1,375.58	3.84
6/29/20 10:50 PM	600		71.70	457.71	1,372.29	4.71				1,375.44	3.98
6/29/20 11:50 PM	660		71.62	457.98	1,372.02	4.98				1,375.24	4.18
6/30/20 12:50 AM	720		71.61	458.04	1,371.96	5.04				1,375.08	4.34
6/30/20 1:50 AM	780		71.63	458.21	1,371.79	5.21				1,374.95	4.47
6/30/20 2:50 AM	840		71.65	458.24	1,371.76	5.24				1,374.78	4.64
6/30/20 3:50 AM	900		71.67	458.38	1,371.62	5.38				1,374.61	4.81
6/30/20 4:50 AM	960		71.61	458.55	1,371.45	5.55				1,374.48	4.94
6/30/20 5:50 AM	1,020		71.62	458.78	1,371.22	5.78				1,374.29	5.13
6/30/20 6:50 AM	1,080		71.67	458.98	1,371.02	5.98				1,374.20	5.22
6/30/20 7:50 AM	1,140		71.67	459.07	1,370.93	6.07				1,374.01	5.41
6/30/20 8:50 AM	1,200		71.65	459.24	1,370.76	6.24				1,373.85	5.57
6/30/20 9:50 AM	1,260		71.65	459.41	1,370.59	6.41				1,373.77	5.64
6/30/20 10:50 AM	1,320		71.66	459.68	1,370.32	6.68				1,373.63	5.79
6/30/20 11:50 AM	1,380		71.66	459.69	1,370.31	6.69				1,373.53	5.89
6/30/20 12:50 PM	1,440		71.68	459.72	1,370.28	6.72				1,373.42	5.99
6/30/20 12:59 PM	1,449	0	71.63	459.85	1,370.15	6.85	12.0	1.71	Pump Stop	1,373.37	6.05
6/30/20 1:00 PM	1,450	1	71.66	459.84	1,370.16	6.84			Meter: 798,562.4 gallons	1,373.39	6.03
6/30/20 1:01 PM	1,451	2	71.62	459.79	1,370.21	6.79			Average Pump Rate: 11.7	1,373.38	6.04
6/30/20 1:02 PM	1,452	3	71.64	459.79	1,370.21	6.79				1,373.41	6.01
6/30/20 1:03 PM	1,453	4	71.65	459.54	1,370.46	6.54				1,373.38	6.04
6/30/20 1:04 PM	1,454	5	71.65	459.46	1,370.54	6.46				1,373.38	6.04
6/30/20 1:05 PM	1,455	6	71.84	459.45	1,370.56	6.45				1,373.45	5.97
6/30/20 1:06 PM	1,456	7	72.00	459.24	1,370.76	6.24				1,373.49	5.93
6/30/20 1:07 PM	1,457	8	72.03	459.25	1,370.75	6.25				1,373.54	5.88
6/30/20 1:08 PM	1,458	9	72.05	459.22	1,370.79	6.22				1,373.60	5.82
6/30/20 1:09 PM	1,459	10	72.07	459.18	1,370.82	6.18				1,373.61	5.81
6/30/20 1:10 PM	1,460	11	72.11	458.97	1,371.04	5.97				1,373.67	5.75
6/30/20 1:11 PM	1,461	12	72.16	459.00	1,371.00	6.00				1,373.69	5.73
6/30/20 1:12 PM	1,462	13	72.17	458.95	1,371.05	5.95				1,373.73	5.69
6/30/20 1:13 PM	1,463	14	72.18	458.88	1,371.12	5.88				1,373.79	5.63

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4 inches Horsepower = 3 HP
MSL = Mean Sea Level Pump Setting = 600 ft EC=Electrical conductivity (mS/cm)

Red Oak Mountain Well No. 6 - Aquifer Test (June 29, 2020)

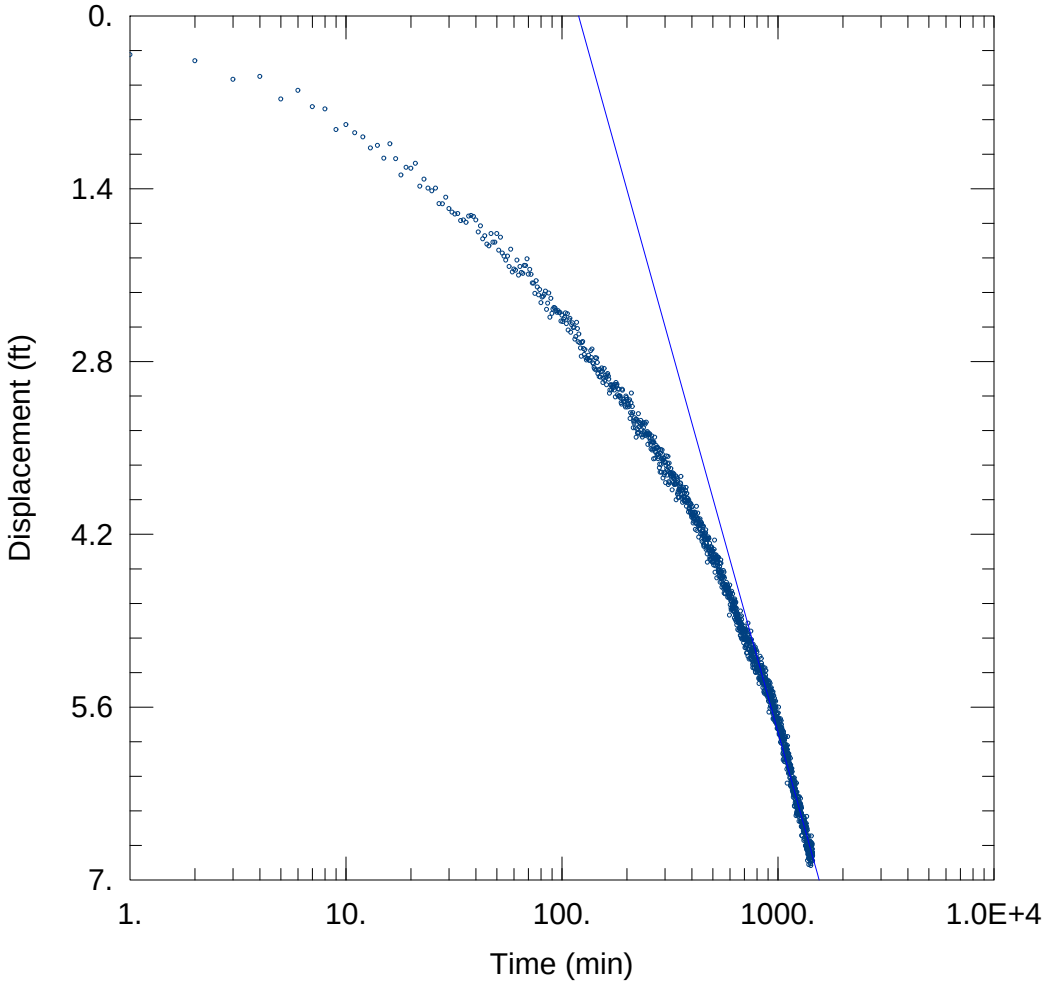
Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW Well No. 6 Temperature (F)	PW Well No. 6 Water Level (ft bgs)	PW Well No. 6 Water Level (ft MSL)	PW Well No. 6 Drawdown (ft)	PW Well No. 6 Pump Rate (gpm)	PW Well No. 6 Specific Capacity (gpm/ft)	Comments	OW Well No. 7 Water Level (ft MSL)	OW Well No. 7 Drawdown (ft)
6/30/20 1:14 PM	1,464	15	72.26	458.76	1,371.24	5.76				1,373.77	5.65
6/30/20 1:19 PM	1,469	20	72.29	458.63	1,371.37	5.63				1,373.92	5.50
6/30/20 1:24 PM	1,474	25	72.34	458.44	1,371.56	5.44				1,374.04	5.38
6/30/20 1:29 PM	1,479	30	72.34	458.39	1,371.61	5.39				1,374.13	5.28
6/30/20 1:34 PM	1,484	35	72.31	458.33	1,371.67	5.33				1,374.21	5.21
6/30/20 1:39 PM	1,489	40	72.29	458.19	1,371.81	5.19				1,374.29	5.13
6/30/20 1:44 PM	1,494	45	72.30	458.21	1,371.79	5.21				1,374.38	5.04
6/30/20 1:49 PM	1,499	50	72.29	458.14	1,371.86	5.14				1,374.46	4.96
6/30/20 1:54 PM	1,504	55	72.27	458.06	1,371.95	5.06				1,374.51	4.91
6/30/20 1:59 PM	1,509	60	72.26	458.06	1,371.94	5.06				1,374.58	4.84
6/30/20 2:14 PM	1,524	75	72.18	457.83	1,372.17	4.83				1,374.72	4.70
6/30/20 2:29 PM	1,539	90	72.15	457.69	1,372.31	4.69				1,374.86	4.56
6/30/20 2:44 PM	1,554	105	71.99	457.46	1,372.54	4.46				1,374.99	4.43
6/30/20 2:59 PM	1,569	120	72.02	457.45	1,372.55	4.45				1,375.09	4.33
6/30/20 3:14 PM	1,584	135	72.00	457.26	1,372.74	4.26				1,375.17	4.25
6/30/20 3:29 PM	1,599	150	71.96	457.26	1,372.75	4.26				1,375.25	4.17
6/30/20 3:44 PM	1,614	165	72.00	457.15	1,372.85	4.15				1,375.31	4.11
6/30/20 3:59 PM	1,629	180	72.03	457.10	1,372.90	4.10				1,375.41	4.01
6/30/20 4:29 PM	1,659	210	71.95	456.97	1,373.04	3.97				1,375.56	3.86
6/30/20 4:59 PM	1,689	240	71.80	456.86	1,373.15	3.86				1,375.67	3.75
6/30/20 5:59 PM	1,749	300	71.65	456.65	1,373.35	3.65				1,375.86	3.56
6/30/20 6:59 PM	1,809	360	71.60	456.32	1,373.68	3.32				1,376.06	3.36
6/30/20 7:59 PM	1,869	420	71.51	456.15	1,373.85	3.15				1,376.21	3.21
6/30/20 8:59 PM	1,929	480	71.42	455.97	1,374.03	2.97				1,376.33	3.09
6/30/20 9:59 PM	1,989	540	71.33	455.84	1,374.16	2.84				1,376.48	2.94
6/30/20 10:59 PM	2,049	600	71.25	455.91	1,374.09	2.91				1,376.60	2.82
6/30/20 11:59 PM	2,109	660	71.23	455.74	1,374.27	2.74				1,376.75	2.67
7/1/20 12:59 AM	2,169	720	71.21	455.62	1,374.38	2.62				1,376.84	2.58
7/1/20 1:59 AM	2,229	780	71.20	455.50	1,374.50	2.50				1,376.99	2.43
7/1/20 2:59 AM	2,289	840	71.16	455.31	1,374.69	2.31				1,377.08	2.34
7/1/20 3:59 AM	2,349	900	71.23	455.35	1,374.65	2.35				1,377.17	2.25
7/1/20 4:59 AM	2,409	960	71.17	455.24	1,374.76	2.24				1,377.28	2.14
7/1/20 5:59 AM	2,469	1,020	71.20	455.11	1,374.89	2.11				1,377.34	2.08

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4 inches Horsepower = 3 HP
MSL = Mean Sea Level Pump Setting = 600 ft EC=Electrical conductivity (mS/cm)

Red Oak Mountain Well No. 6 - Aquifer Test (June 29, 2020)

Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW Well No. 6 Temperature (F)	PW Well No. 6 Water Level (ft bgs)	PW Well No. 6 Water Level (ft MSL)	PW Well No. 6 Drawdown (ft)	PW Well No. 6 Pump Rate (gpm)	PW Well No. 6 Specific Capacity (gpm/ft)	Comments	OW Well No. 7 Water Level (ft MSL)	OW Well No. 7 Drawdown (ft)
7/1/20 6:59 AM	2,529	1,080	71.21	455.03	1,374.97	2.03				1,377.44	1.98
7/1/20 7:59 AM	2,589	1,140	71.13	455.03	1,374.98	2.03				1,377.51	1.91
7/1/20 8:59 AM	2,649	1,200	71.16	455.06	1,374.94	2.06				1,377.54	1.88
7/1/20 9:59 AM	2,709	1,260	71.14	454.93	1,375.07	1.93				1,377.61	1.81
7/1/20 10:59 AM	2,769	1,320	71.16	454.88	1,375.12	1.88				1,377.65	1.76
7/1/20 11:59 AM	2,829	1,380	71.15	454.93	1,375.07	1.94				1,377.78	1.64
7/1/20 12:59 PM	2,889	1,440	71.14	454.87	1,375.13	1.87				1,377.84	1.58
7/1/20 1:39 PM	2,929	1,480	71.18	454.92	1375.09	1.92					

Note: bgs = below ground surface Column Pipe Diameter = 1 1/4 inches Horsepower = 3 HP
MSL = Mean Sea Level Pump Setting = 600 ft EC=Electrical conductivity (mS/cm)



WELL TEST ANALYSIS

Data Set: \...\Well No. 6 PW.aqt
Date: 07/20/20 Time: 13:11:37

PROJECT INFORMATION

Company: WRGS
Client: Lone Star Land Partners
Project: 083-001-20
Location: Blanco County
Test Well: Well No. 6
Test Date: 6-29-20

AQUIFER DATA

Saturated Thickness: 192. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well No. 6	0	0

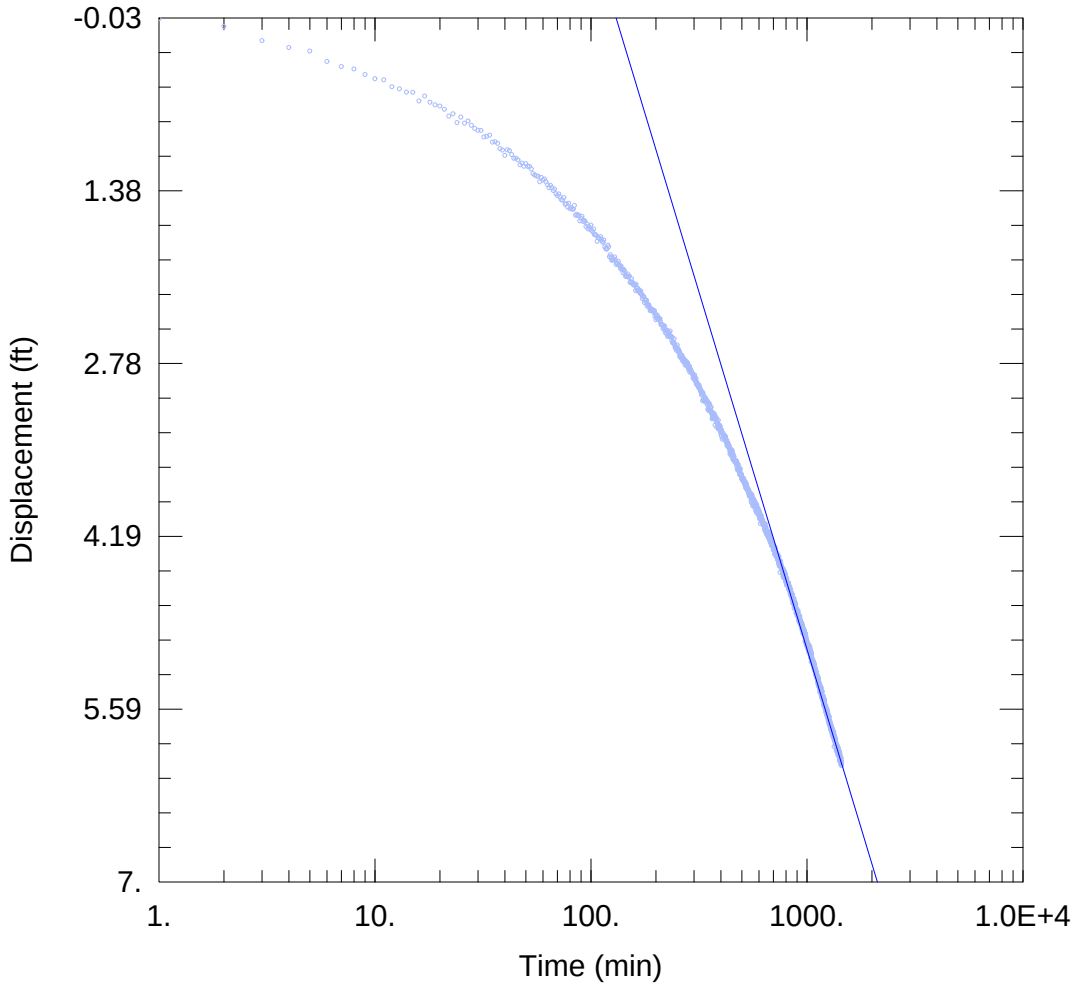
Observation Wells

Well Name	X (ft)	Y (ft)
◦ Well No. 6	0	0

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob

T = 67.34 ft^2/day K = 0.35 ft/day



WELL TEST ANALYSIS

Data Set: \...\Well No. 7 OW.aqt
Date: 07/20/20 Time: 13:12:32

PROJECT INFORMATION

Company: WRGS
Client: Lone Star Land Partners
Project: 083-001-20
Location: Blanco County
Test Well: Well No. 6
Test Date: 6-29-20

AQUIFER DATA

Saturated Thickness: 192. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well No. 6	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
Well No. 7	462	0

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob

T = 72.82 ft^2/day S = 7.043E-5

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 = 26 gpm / 69.57 ft = 0.37 gpm/ft

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

Where: T = Transmissivity, in gpd/ft
t = Time of pumping, in days
S = Storage Coefficient, = 2.20 x 10^{-5}
r = radius of well, in ft.

Theoretical Specific Capacity = $\frac{300.73}{264 \log \frac{0.3(300.73)(1)}{0.1875^2 (2.20 \times 10^{-5})}}$ **= 0.14**

Efficiency = Actual Specific Capacity / Theoretical Specific Capacity = 0.37 / 0.14 = **264%**

Well Efficiency

Well No. 3

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. 3

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 = 13 gpm / 58.43 ft = 0.22 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, = 1.63 x 10^{-5}
r = radius of well, in ft.

Theoretical Specific Capacity = $\frac{485.96}{264\log\frac{0.3(485.96)(1)}{0.1875^2(1.63 \times 10^{-5})}}$ **= 0.22**

Efficiency = Actual Specific Capacity / Theoretical Specific Capacity = 0.22 / 0.22 **= 100%**

Well Efficiency

Well No. 5

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. 5

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 = 24 gpm / 17.56 ft = 1.37 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, = 4.94 x 10^{-5}
r = radius of well, in ft.

Theoretical Specific Capacity = $\frac{510.20}{264\log\frac{0.3(510.20)(1)}{0.1875^2(4.94 \times 10^{-5})}}$ **= 0.24**

Efficiency = Actual Specific Capacity / Theoretical Specific Capacity = 1.37 / 0.24 **= 571%**

Well Efficiency

Well No. 8

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. 8

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 = 11 gpm / 79.07 ft = 0.14 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, = 4.71 x 10^{-5}
r = radius of well, in ft.

Theoretical Specific Capacity = $\frac{775.78}{264\log\frac{0.3(775.78)(1)}{0.1875^2(4.71 \times 10^{-5})}}$ **= 0.36**

Efficiency = Actual Specific Capacity / Theoretical Specific Capacity = 0.14 / 0.36 **= 39%**

Well Efficiency

Well No. 6

Wet Rock Groundwater Services, L.L.C.
Groundwater Specialists
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Austin, Texas 78734 • Ph: 512-773-3226
www.wetrockgs.com

Well Efficiency Calculations
Well No. 6

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 = 12 gpm / 6.85 ft = 1.71 gpm/ft

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

Where: T = Transmissivity, in gpd/ft
t = Time of pumping, in days
S = Storage Coefficient, = 7.04 x 10^{-5}
r = radius of well, in ft.

Theoretical Specific Capacity = $\frac{503.47}{264 \log \frac{0.3(503.47)(1)}{0.1875^2 (7.04 \times 10^{-5})}}$ **= 0.24**

Efficiency = Actual Specific Capacity / Theoretical Specific Capacity = 1.71 / 0.24 **= 712%**

Appendix F

Water Quality Report

Water Quality

Well No. 2

Email information for report date:
7/19/20 18:30

D019479

Apex Drilling

Attn: Michael Becker
apexdrilling.becker@yahoo.com

PO Box 867
Marble Falls, TX 78654

COVID-19 UPDATE:
Aqua-Tech understands the concerns our clients have about the impact of COVID-19. Although we cannot predict what government or supply chain restrictions might develop, we have no plans to cease or limit our field and lab services.

We are following CDC recommendations and taking precautions to keep our clients and employees safe. This includes additional sanitation procedures and implementation of enhanced procedures for sample receiving. ATL is asking clients to help by placing samples in designated areas and using provided sanitizer. We also request any client that may be ill or may have been exposed to COVID-19 to contact us before entering our facilities. We will work out an individualized receipt protocol in these cases.

Thank you for your business,
June M. Brien
Executive Technical Director

CORPORATE OFFICE
635 Phil Gramm Boulevard
Bryan, TX 77807
Phone: (979) 778-3707
Fax: (979) 778-3193

AQUA-TECH LABORATORIES, INC.

AUSTIN OFFICE
7500 Hwy 71 W, Suite 105
Austin, TX 78735
Phone: (512) 301-9559
Fax: (512) 301-9552

The analyses summarized in this report were performed by Aqua-Tech Laboratories, Inc. unless otherwise noted. Aqua-Tech Laboratories, Inc. holds accreditation from the State of Texas in accordance with TNI and/or through the TCEQ Drinking Water Commercial Laboratory Approval Program.

The following abbreviations indicate certification status:

NEL	TNI accredited parameter.
ANR	Accreditation not required by the State of Texas.
DWP	Accreditation through the TCEQ Drinking Water Commercial Laboratory Approval Program.
INF	Aqua-Tech Laboratories, Inc. is not accredited for this parameter. It is reported on an informational basis only.

Subcontracted data summarized in this report is indicated by "Sub" in the Lab column.

TCEQ DW Lab ID TX 239

General Definitions:

NR	Not Reported.
RPD	Relative Percent Difference.
% R	Percent Recovery.
dry	Results with the "dry" unit designation are reported on a "dry weight" basis.
SQL	The Sample Quantitation Limit is the value below which the parameter cannot reliably be detected. The SQL includes all sample preparations, dilutions and / or concentrations.
Adj MDL	The Adjusted Method Detection Limit is the MDL value adjusted for any sample dilutions or concentrations .
MDL	The Method Detection Limit is the lowest theoretical value that is statistically different from zero for a specific method, taking into account all preparation steps and instrument settings.

All samples are reported on an "as received" basis unless the designation "dry" is added to the reported unit.

Copies of Aqua-Tech Laboratories, Inc. procedures and individual sampling plans are available upon request. Note that samples are collected by Aqua-Tech Laboratories, Inc. personnel unless otherwise noted in the "Sample Collected" field of this report as "Client" or "CLT".

Samples included in this report were received in acceptable condition according to Aqua-Tech Laboratories, Inc. procedures and 40 CFR, Chapter I, Subchapter D, Part 136.3, TABLE II. - *Required containers, preservation techniques, and holding times*, unless otherwise noted in this report.

Record Retention:

All reports, raw data, and associated quality control data are kept on file for 10 years before being destroyed. Any client that would like copies of records must contact Aqua-Tech Laboratories, Inc. no later than six months prior to the scheduled disposal. An administrative fee for retrieval and distribution will apply.

This report was approved by:

June M. Brien, Technical Director

corp@aqua-techlabs.com www.aqua-techlabs.com

CORPORATE OFFICE
635 Phil Gramm Boulevard
Bryan, TX 77807
Phone: (979) 778-3707
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AQUA-TECH LABORATORIES, INC.

AUSTIN OFFICE
7500 Hwy 71 W, Suite 105
Austin, TX 78735
Phone: (512) 301-9559
Fax: (512) 301-9552

Analytical Report

Apex Drilling

Report Printed: **7/19/20** **18:30**

D019479

Apex Drilling RED OAK WELL 2

Collected: 06/16/20 13:00 by CLIENT
Received: 06/17/20 10:20 by Kelly Kukowski

Type: Grab | *Matrix*: Drinking Water | *C-O-C #*: D019479

Lab ID# D019479-01	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
General Chemistry											
Total Dissolved Solids	**2390**	mg/L		25.0	100	100	*Bryan*	06/19/20 08:30 MRH	SM2540 C 2011	M114825	NEL
Nitrate as N (NO3N)	**0.0201**	mg/L			0.0200	0.0200	*Austin*	06/18/20 14:35 JLL	SM4500-NO3-F 2011	[CALC]	NEL
Nitrite as N	**<0.01**	mg/L	G-01	0.002	0.002	0.01	*Austin*	06/17/20 08:35 JLL	SM4500 NO2- B 2011	M114717	NEL
Nitrate/Nitrite as N	**0.02**	mg/L		0.02	0.02	0.02	*Bryan*	06/18/20 14:35 JKA	SM4500-NO3-F 2011	M114798	ANR
Fluoride	**2.53**	mg/L		0.04	0.04	0.10	*Bryan*	06/23/20 18:33 MRH	SM4500-F C 2011	M115015	NEL
pH, Lab	**7.2**	S.U.	Hold-03		N/A	N/A	*Austin*	06/17/20 13:15 MSA	SM4500-H+ B 2011	M114754	DWP
Temperature @ pH Analysis	**22.2**	Deg. C			N/A	N/A	*Austin*	06/17/20 13:15 MSA	SM4500-H+ B 2011	M114754	DWP
Specific Conductance (adjusted to 25.0°C)	**3070**	uS/cm		2.00	5.00	5.00	*Bryan*	06/29/20 11:35 CJO	SM2510 B 2011	M115245	DWP,NEL
Metals (Total)											
Manganese	**8.85**	ug/L		0.108	0.135	0.625	*Bryan*	06/25/20 17:50 AOG	EPA 200.8 R5.4	M114997	NEL

D019479-01 - re-analysis	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
General Chemistry											
Total Hardness (EDTA) as CaCO3	**1300**	mg/L		1.00	5.00	5.00	*Bryan*	07/06/20 18:33 MRH	SM2340 C 2011	M115318	NEL
Metals (Total)											
Iron	**0.326**	mg/L		0.002	0.001	0.005	*Bryan*	07/10/20 16:47 PNS	EPA 200.7 R4.4	M115654	NEL

Please see the attached sub-contract report for sub-contracted analysis.

Apex Drilling RED OAK WELL 3

Collected: 06/16/20 14:00 by CLIENT
Received: 06/17/20 10:20 by Kelly Kukowski

Type: Grab | *Matrix*: Drinking Water | *C-O-C #*: D019479

Lab ID# D019479-02	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
General Chemistry											
Total Dissolved Solids	**2670**	mg/L		25.0	100	100	*Bryan*	06/19/20 08:30 MRH	SM2540 C 2011	M114826	NEL
Nitrate as N (NO3N)	**0.0958**	mg/L			0.0200	0.0200	*Austin*	06/18/20 14:35 JLL	SM4500-NO3-F 2011	[CALC]	NEL
Nitrite as N	**<0.01**	mg/L	J, G-01 (0.003)	0.002	0.002	0.01	*Austin*	06/17/20 08:35 JLL	SM4500 NO2- B 2011	M114717	NEL
Nitrate/Nitrite as N	**0.10**	mg/L		0.02	0.02	0.02	*Bryan*	06/18/20 14:35 JKA	SM4500-NO3-F 2011	M114798	ANR
Fluoride	**2.75**	mg/L		0.04	0.04	0.10	*Bryan*	06/23/20 18:33 MRH	SM4500-F C 2011	M115015	NEL
pH, Lab	**7.1**	S.U.	Hold-03		N/A	N/A	*Austin*	06/17/20 13:15 MSA	SM4500-H+ B 2011	M114754	DWP
Temperature @ pH Analysis	**22.5**	Deg. C			N/A	N/A	*Austin*	06/17/20 13:15 MSA	SM4500-H+ B 2011	M114754	DWP
Specific Conductance (adjusted to 25.0°C)	**3360**	uS/cm		2.00	5.00	5.00	*Bryan*	06/29/20 11:35 CJO	SM2510 B 2011	M115245	DWP,NEL
Metals (Total)											
Manganese	**11.9**	ug/L		0.108	0.135	0.625	*Bryan*	06/25/20 18:00 AOG	EPA 200.8 R5.4	M114997	NEL

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Apex Drilling

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D019479

D019479-02 - re-analysis	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
General Chemistry											
Total Hardness (EDTA) as CaCO3	**1470**	mg/L		1.00	5.00	5.00	*Bryan*	07/06/20 18:33 MRH	SM2340 C 2011	M115318	*NEL*
Metals (Total)											
Iron	**0.124**	mg/L		0.002	0.001	0.005	*Bryan*	07/10/20 16:51 PNS	EPA 200.7 R4.4	M115654	*NEL*

Please see the attached sub-contract report for sub-contracted analysis.

Explanation of Notes

G-01	This sample was added to an analytical run already in progress. See the prep time for when this sample was added.
Hold-03	This parameter was outside of EPA holding at the time the sample was received in the laboratory.
J	Analyte detected below the SQL but above the MDL.

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D019479

General Chemistry - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Fluoride - SM4500-F C 2011														*Bryan*
Initial Cal Check	0.47	mg/L				06/23/20 18:33 MRH	0.428		110	90 - 110			2006259	
Blank	<0.10	mg/L		0.04	0.10	06/23/20 18:33 MRH							M115015	
LCS	0.83	mg/L		0.04	0.10	06/23/20 18:33 MRH	0.798		104	90 - 110			M115015	
LCS Dup	0.81	mg/L		0.04	0.10	06/23/20 18:33 MRH	0.798		101	90 - 110	3.05	6.23	M115015	
Matrix Spike	3.43	mg/L		0.04	0.10	06/23/20 18:33 MRH	0.798	2.53	113	78.1 - 125			M115015	
Matrix Spike Dup	3.46	mg/L		0.04	0.10	06/23/20 18:33 MRH	0.798	2.53	116	78.1 - 125	3.28	5.72	M115015	
MRL Check	0.10	mg/L		0.04	0.10	06/23/20 18:33 MRH	0.0998		98.0	73.4 - 118			M115015	
Nitrate/Nitrite as N - SM4500-NO3-F 2011														*Bryan*
Initial Cal Check	1.78	mg/L				06/18/20 14:35 JKA	1.69		106	90 - 110			2006218	
Low Cal Check	0.02	mg/L				06/18/20 14:35 JKA	0.0200		100	70 - 130			2006218	
Blank	<0.02	mg/L		0.02	0.02	06/18/20 14:35 JKA							M114798	
LCS	0.51	mg/L		0.02	0.02	06/18/20 14:35 JKA	0.500		102	91.3 - 109			M114798	
LCS Dup	0.51	mg/L		0.02	0.02	06/18/20 14:35 JKA	0.500		102	91.3 - 109	0.362	6.8	M114798	
Matrix Spike	1.91	mg/L		0.02	0.02	06/18/20 14:35 JKA	0.500	1.40	102	94.7 - 117			M114798	
Matrix Spike Dup	1.94	mg/L		0.02	0.02	06/18/20 14:35 JKA	0.500	1.40	108	94.7 - 117	5.53	8.65	M114798	
Nitrite as N - SM4500 NO2- B 2011														*Austin*
Blank	<0.01	mg/L		0.002	0.01	06/17/20 08:35 JLL							M114717	
LCS	0.08	mg/L		0.002	0.01	06/17/20 08:35 JLL	0.0800		100	90 - 110			M114717	
LCS	0.08	mg/L		0.002	0.01	06/17/20 08:35 JLL	0.0800		99.4	90 - 110			M114717	
LCS Dup	0.08	mg/L		0.002	0.01	06/17/20 08:35 JLL	0.0800		105	90 - 110	4.25	8.12	M114717	
LCS Dup	0.08	mg/L		0.002	0.01	06/17/20 08:35 JLL	0.0800		99.4	90 - 110	0.00	8.12	M114717	
Matrix Spike	0.08	mg/L		0.002	0.01	06/17/20 08:35 JLL	0.0800	<0.01	95.5	70.6 - 117			M114717	
Matrix Spike Dup	0.08	mg/L		0.002	0.01	06/17/20 08:35 JLL	0.0800	<0.01	95.5	70.6 - 117	0.00	8.18	M114717	
MRL Check	<0.01	mg/L	*J (0.009)*	0.002	0.01	06/17/20 08:35 JLL	0.0100		88.8	70 - 130			M114717	
pH, Lab - SM4500-H+ B 2011														*Austin*
Duplicate	7.7	Std Units				06/17/20 13:15 MSA		7.7			0.130	1.18	M114754	
Reference	7.0	Std Units				06/17/20 13:15 MSA	6.86		101	95 - 105			M114754	
Reference	9.2	Std Units				06/17/20 13:15 MSA	9.18		100	95 - 105			M114754	
Reference	7.0	Std Units				06/17/20 13:15 MSA	6.86		101	95 - 105			M114754	
Reference	9.2	Std Units				06/17/20 13:15 MSA	9.18		100	95 - 105			M114754	

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Analytical Report

Apex Drilling

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D019479

General Chemistry - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Specific Conductance (adjusted to 25.0°C) - SM2510 B 2011														*Bryan*
Initial Cal Check	447	uS/cm				06/29/20 11:35 CJO	437		102	85 - 115			2006330	
Blank	<2.00	uS/cm		2.00	2.00	06/29/20 11:35 CJO							M115245	
Duplicate	3300	uS/cm		5.00	5.00	06/29/20 11:35 CJO		3360			1.95	2	M115245	
LCS	1460	uS/cm		2.00	2.00	06/29/20 11:35 CJO	1410		103	90 - 110			M115245	
Total Dissolved Solids - SM2540 C 2011														*Bryan*
Blank	<25.0	mg/L		25.0	25.0	06/19/20 08:30 MRH							M114825	
Duplicate	276	mg/L		100	100	06/19/20 08:30 MRH		280			1.44	9.13	M114825	
Reference	488	mg/L		100	100	06/19/20 08:30 MRH	500		97.6	81 - 121			M114825	
Blank	<25.0	mg/L		25.0	25.0	06/19/20 08:30 MRH							M114826	
Duplicate	2680	mg/L		100	100	06/19/20 08:30 MRH		2670			0.150	9.13	M114826	
Reference	488	mg/L		100	100	06/19/20 08:30 MRH	500		97.6	81 - 121			M114826	
Total Hardness (EDTA) as CaCO3 - SM2340 C 2011														*Bryan*
Initial Cal Check	56.0	mg/L				06/26/20 06:30 MRH	54.4		103	85 - 115			2006305	
Initial Cal Check	50.0	mg/L				07/06/20 18:33 MRH	54.4		91.9	85 - 115			2007056	
Blank	<1.00	mg/L		1.00	1.00	07/06/20 18:33 MRH							M115318	
Duplicate	<1.00	mg/L		1.00	1.00	07/06/20 18:33 MRH		<1.00				9.52	M115318	
LCS	79.2	mg/L		1.00	1.00	07/06/20 18:33 MRH	80.0		99.0	90 - 110			M115318	
LCS Dup	79.2	mg/L		1.00	1.00	07/06/20 18:33 MRH	80.0		99.0	90 - 110	0.00	6.47	M115318	
Matrix Spike	89.6	mg/L		1.00	1.00	07/06/20 18:33 MRH	80.0	<1.00	112	85 - 115			M115318	
MRL Check	4.17	mg/L		1.00	1.00	07/06/20 18:33 MRH	4.00		104	70 - 130			M115318	

Metals (Total) - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Iron - EPA 200.7 R4.4														*Bryan*
Blank	<0.005	mg/L		0.001	0.005	07/10/20 16:31 PNS							M115654	
LCS	0.455	mg/L		0.001	0.005	07/10/20 16:34 PNS	0.500		90.9	84.5 - 115.4			M115654	
LCS Dup	0.482	mg/L		0.001	0.005	07/10/20 16:37 PNS	0.500		96.5	84.5 - 115.4	5.91	20	M115654	
Duplicate	0.141	mg/L		0.001	0.005	07/10/20 16:41 PNS		0.169			18.3	20	M115654	
Matrix Spike	0.593	mg/L		0.001	0.005	07/10/20 16:44 PNS	0.500	0.169	84.8	69.5 - 130.4			M115654	

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Metals (Total) - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Manganese - EPA 200.8 R5.4														*Bryan*
Blank	<0.625	ug/L		0.135	0.625	06/25/20 16:29 AOG							M114997	
LCS	4.29	ug/L		0.135	0.625	06/25/20 17:11 AOG	5.00		85.8	84.5 - 115.4			M114997	
LCS Dup	4.43	ug/L		0.135	0.625	06/25/20 17:21 AOG	5.00		88.6	84.5 - 115.4	3.24	20	M114997	
Duplicate	11.8	ug/L		0.135	0.625	06/25/20 17:30 AOG		11.9			0.615	20	M114997	
Matrix Spike	15.6	ug/L		0.135	0.625	06/25/20 17:40 AOG	5.00	11.9	74.9	69.5 - 130.4			M114997	

Preparation Procedures - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Turbidity - SM2130 B 2011														*Bryan*
Initial Cal Check	4.3	NTU				05/26/20 20:44 MRH	4.65		93.1	90 - 110			2005292	

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Sample Preparation Summary

Sample	Method	Prepared	Lab	Bottle	Initial	Units	Final	Units	External Dilution Factor	Batch
D019479-01										
Fluoride	SM4500-F C 2011	6/23/20 18:33 MRH	Bryan	D	25.0	mL	25.0	mL	1	M115015
Manganese	EPA 200.8 R5.4	6/23/20 15:17 AOG	Bryan	E	50.0	mL	25.0	mL	2.5	M114997
Nitrate/Nitrite as N	SM4500-NO3-F 2011	6/18/20 12:42 JKA	Bryan	B	10.0	mL	10.0	mL	1	M114798
Nitrite as N	SM4500 NO2- B 2011	6/17/20 13:40 JLL	Austin	A	25.0	mL	25.0	mL	1	M114717
pH, Lab	SM4500-H+ B 2011	6/17/20 13:15 MSA	Austin	A	50.0	mL	50.0	mL	1	M114754
Sample Acidified to pH<2 in Lab	N/A	6/17/20 10:47 KK	Bryan	E	100	mL	100	mL	1	M114743
Specific Conductance (adjusted to 25.0°C)	SM2510 B 2011	6/29/20 11:35 CJO	Bryan	D	20.0	mL	50.0	mL	1	M115245
Temperature @ pH Analysis	SM4500-H+ B 2011	6/17/20 13:15 MSA	Austin	A	50.0	mL	50.0	mL	1	M114754
Total Dissolved Solids	SM2540 C 2011	6/19/20 8:30 MRH	Bryan	D	25.0	mL	100	mL	1	M114825
Turbidity	SM2130 B 2011	6/19/20 13:42 BLC	Bryan	A	10.0	mL	10.0	mL	1	M114867
D019479-01RE1										
Iron	EPA 200.7 R4.4	7/8/20 17:55 BLC	Bryan	E	50.0	mL	25.0	mL	1	M115654
Sample Acidified to pH<2 in Lab	N/A	6/17/20 10:48 KK	Bryan	B	100	mL	100	mL	1	M114744
Total Hardness (EDTA) as CaCO3	SM2340 C 2011	6/30/20 15:25 BLC	Bryan	E	10.0	mL	50.0	mL	1	M115318
D019479-02										
Fluoride	SM4500-F C 2011	6/23/20 18:33 MRH	Bryan	D	25.0	mL	25.0	mL	1	M115015
Manganese	EPA 200.8 R5.4	6/23/20 15:17 AOG	Bryan	E	50.0	mL	25.0	mL	2.5	M114997
Nitrate/Nitrite as N	SM4500-NO3-F 2011	6/18/20 12:42 JKA	Bryan	B	10.0	mL	10.0	mL	1	M114798
Nitrite as N	SM4500 NO2- B 2011	6/17/20 13:40 JLL	Austin	A	25.0	mL	25.0	mL	1	M114717
pH, Lab	SM4500-H+ B 2011	6/17/20 13:15 MSA	Austin	A	50.0	mL	50.0	mL	1	M114754
Sample Acidified to pH<2 in Lab	N/A	6/17/20 10:47 KK	Bryan	E	100	mL	100	mL	1	M114743
Specific Conductance (adjusted to 25.0°C)	SM2510 B 2011	6/29/20 11:35 CJO	Bryan	D	20.0	mL	50.0	mL	1	M115245
Temperature @ pH Analysis	SM4500-H+ B 2011	6/17/20 13:15 MSA	Austin	A	50.0	mL	50.0	mL	1	M114754
Total Dissolved Solids	SM2540 C 2011	6/19/20 8:30 MRH	Bryan	D	25.0	mL	100	mL	1	M114826
Turbidity	SM2130 B 2011	6/19/20 13:42 BLC	Bryan	E	10.0	mL	10.0	mL	1	M114872
D019479-02RE1										
Iron	EPA 200.7 R4.4	7/8/20 17:55 BLC	Bryan	E	50.0	mL	25.0	mL	1	M115654
Sample Acidified to pH<2 in Lab	N/A	6/17/20 10:48 KK	Bryan	B	100	mL	100	mL	1	M114744
Total Hardness (EDTA) as CaCO3	SM2340 C 2011	6/30/20 15:25 BLC	Bryan	E	10.0	mL	50.0	mL	1	M115318

AQUA-TECH LABORATORIES, INC

Chain-of-Custody and Analysis Request

Aqua-Tech Laboratories, Inc.

Austin	Bryan
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Austin, TX 78735	Bryan, TX 77807
512.301.9559	979.778.3707

T104704371
TX239

Test results meet all accreditation/certification requirements unless stated otherwise.

Work Order / C-O-C: D019479
Page 1 of 1
V-0023 R03

Client /Project:

Contact Info
Name: Apex Drilling
Address
City State ZIP
Phone / Email

Definitions
DW - Drinking Water
NP - Non-Potable Water
S - Solid
CM - Custody Maintained
CTU - Custody Transfer Unbroken
CT - Corrected Temperature
SUB - Subcontracted Analysis

(+) Container Type
P - Plastic
G - Glass
T - Teflon©

By relinquishing the samples listed below to Aqua-Tech, the client agrees to the following terms.
Samples will be analyzed by a method that is within Aqua-Tech Laboratories' NELAC fields of accreditation. Analytes requiring a certified method that is not within Aqua-Tech's fields of accreditation will be subcontracted to a NELAC certified lab that is certified for that method. Clients will be notified of the subcontract lab's details. Other analytes not requiring accreditation will be analyzed by a compendial method. If a specific method is required, the client will note the method in the "Analysis Requested" column. The client approves all method modifications documented by Aqua-Tech or the subcontract lab. A current list of Aqua-Tech's NELAC fields of accreditation and other methods are available on request.

Sample Custody

			Date / Time	
Relinquished by (print & sign)	W BECKER	☐ Sampler ☐ Client ☐ ATL Field	Date 6-17-20 Time 10:20	☐ Iced / Refrig ☐ Custody Sealed
Received by (print & sign)		☐ Client ☐ ATL Field	Date Time	☐ Iced / Refrig ☐ CM / CTU
Relinquished by (print & sign)	(struck through)	☐ Client ☐ ATL Field	Date Time	☐ Iced / Refrig ☐ CM / CTU
Received by (print & sign)		☐ Client ☐ ATL Field	Date Time	☐ Iced / Refrig ☐ CM / CTU
Relinquished by (print & sign)		☐ Client ☐ ATL Field	Date Time	☐ Iced / Refrig ☐ CM / CTU / sealed
Received by (print & sign)	Kelly Kukowski [signature]	☑ Lab	Date 6/17/20 Time 1020	☑ Cond Good ☑ Iced / Refrig ☐ CM / CTU

Client Comments:

* Preservatives		Receipt in Lab		
1	< 6 °C (unfrozen)	Cooler ID :	Cet	
2	H2SO4	Temperature (°C) : read / CT	5.1/5.1	NA
3	HCl			
4	HNO3	Preservation Correct ?	YES NO	YES NO
5	Na2S2O3	Post Preservatives ?	YES NO	YES NO
6	NaOH	Thermometer ID :	0715570	
7		pH Paper ID :	0744948	

Lab Comments

LAB USE ONLY BELOW (initials KK)

Field Sample ID (record field data for each sample in space below)	Start Date	Start Time	End Date	End Time	Composite Type	Sample Matrix	Bottle Count	Volume (Size in L)	Type (+)	Preserv-ative(s) *	Cooler ID	pH Check	SUB	WORK ORDER See Below Sample	
RED OAK #2	6-16-20	13:00	—		G	DW	1	4	P	1	Cet	—	Ana		A
Analysis Requested & Comments: Cl Cond F Fe NO3 Mn pH SO4 TDS Total Hardness											D019479-01				
RED OAK #2	6-16-20	13:00	—		G	DW	1	0.12	STP	1,5	Cet	—	—		A 8
Analysis Requested & Comments: Total Coliform P/A											D019486-01				
RED OAK #3	6-16-20	14:00	—		G	DW	1	4	1	1	Cet	—	Ana		A
Analysis Requested & Comments: Cl Cond F Fe NO3 Mn pH SO4 TDS Total Hardness											D019479-02				
RED OAK #3	6-16-20	14:00	—		G	DW	1	0.12	STP	1,5	Cet	—	—		9
Analysis Requested & Comments: Total Coliform P/A											D019486-02A				
(struck through)															
Analysis Requested & Comments:															

Ana-Lab Corp.
2600 Dudley Rd. Kilgore, Texas 75662
P.O. Box 9000 Kilgore, Texas 75663
*Office: 903-984-0551 * Fax: 903-984-5914*

ANA LAB
Testing the Limits of Science and Service

Project
925479

AQU5-C

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Printed 06/24/2020 9:22

TABLE OF CONTENTS

This report consists of this Table of Contents and the following pages:

NELAP-accredited #T104704201-20-17

Ana-Lab Corp.
2600 Dudley Rd. Kilgore, Texas 75662
P.O. Box 9000 Kilgore, Texas 75663
Office: 903-984-0551 * Fax: 903-984-5914

ANA LAB
Testing the Limits of Science and Service

AQU5-C

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Project
925479

Printed: 06/24/2020

Results

Sample Results

1898051 D019479-01 Received: 06/19/2020

Drinking Water Collected by: Client Aqua-Tech Laboratori PO:
Taken: 06/16/2020 13:00:00

EPA 300.0 2.1 Prepared: 903039 06/19/2020 19:24:00 Analyzed 903039 06/19/2020 19:24:00 KLB

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	Chloride	115	mg/L	3.00			01

EPA 300.0 2.1 Prepared: 903248 06/22/2020 12:47:00 Analyzed 903248 06/22/2020 12:47:00 ATN

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	Sulfate	999	mg/L	30.0	P		01

1898052 D019479-02 Received: 06/19/2020

Drinking Water Collected by: Client Aqua-Tech Laboratori PO:
Taken: 06/16/2020 14:00:00

EPA 300.0 2.1 Prepared: 903039 06/19/2020 19:49:00 Analyzed 903039 06/19/2020 19:49:00 KLB

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	Chloride	117	mg/L	3.00			01

EPA 300.0 2.1 Prepared: 903248 06/22/2020 17:44:00 Analyzed 903248 06/22/2020 17:44:00 ATN

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	Sulfate	1550	mg/L	30.0	P		01

NELAP-accredited #T104704201-20-17

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Testing the Limits of Science and Service

AQU5-C

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Project
925479

Printed: 06/24/2020

Qualifiers:

P - Spike recovery outside control limits due to matrix effects.

We report results on an As Received or wet basis unless marked Dry Weight. Unless otherwise noted, testing was performed at Ana-labs corporate laboratory that holds the following Federal and State certificates: EPA Lab Number TX00063, US Department of Agriculture Soil Import Permit P330-17-00117, Texas Commission on Environmental Quality Commercial Drinking Water Lab Approval (Lab ID: TX219), Texas Commission on Environmental Quality NELAP T104704201-20-17, Louisiana Department of Environmental Quality Laboratory Certification (NELAP, LELAP) #02008, Louisiana Department of Health and Hospitals Drinking Water (NELAP) Certificate No LA026, Oklahoma Department of Environmental Quality TNI Laboratory Accreditation Program Certificate No. 2018-126, Arkansas Department of Environmental Quality Certification #18-068-0. The Accredited column designates accreditation by N -- NELAC, or z -- not covered under NELAC scope of accreditation.
These analytical results relate to the sample tested. This report may NOT be reproduced EXCEPT in FULL without written approval of Ana-Lab Corp. Unless otherwise specified, these test results meet the requirements of NELAC.
RL is the Reporting Limit (sample specific quantitation limit) and is at or above the Method Detection Limit (MDL). CAS is Chemical Abstract Service number. RL is our Reporting Limit, or Minimum Quantitation Level. The RL takes into account the Instrument Detection Limit (IDL), Method Detection Limit (MDL), and Practical Quantitation Limit (PQL), and any dilutions and/or concentrations performed during sample preparation (EQL). Our analytical result must be above this RL before we report a value in the 'Results' column of our report (without a 'J' flag). Otherwise, we report ND (Not Detected above RL), because the result is "<" (less than) the number in the RL column. MAL is Minimum Analytical Level and is typically from regulatory agencies. Unless we report a result in the result column, or interferences prevent it, we work to have our RL at or below the MAL.

Bill Peery, MS, VP Technical Services

NELAP-accredited #T104704201-20-17

2600 Dudley Rd. Kilgore, Texas 75662
P.O. Box 9000 Kilgore, Texas 75663
Office: 903-984-0551 * Fax: 903-984-5914

ANALAB
Testing the Limits of Science and Service

RESULTS

Project
925479

Printed 06/24/2020

DW

AQU5

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

CAS	Parameter	Results	MDL	SDL	MQL	MQLAdj	Flag	Units	Target	Bottle	Dilute
Drinking Water	**Ion Chromatography**										**EPA 300.0 2.1**
1898051	**D019479-01**										
		Collection:	06/16/2020	13:00:00	Client				*Received:*	06/19/2020	
	Prepared: ***903039***										
				Analyzed:	***903039***			6/19/20	19:24:00		
	Chloride	**115**	0.0196	0.196	0.300	3.00		**mg/L**	250 Secondary Standard	01	10.00
	Prepared: ***903248***										
				Analyzed:	***903248***			6/22/20	12:47:00		
	Sulfate	**999**	0.00775	0.775	0.300	30.0	P	**mg/L**	250 Secondary Standard	01	100.00
1898052	**D019479-02**										
		Collection:	06/16/2020	14:00:00	Client				*Received:*	06/19/2020	
	Prepared: ***903039***										
				Analyzed:	***903039***			6/19/20	19:49:00		
	Chloride	**117**	0.0196	0.196	0.300	3.00		**mg/L**	250 Secondary Standard	01	10.00
	Prepared: ***903248***										
				Analyzed:	***903248***			6/22/20	17:44:00		

NELAP-accredited #T104704201-20-17

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P.O. Box 9000 Kilgore, Texas 75663
Office: 903-984-0551 * Fax: 903-984-5914

ANA LAB
Testing the Limits of Science and Service

RESULTS

Project
925479

AQU5

Printed 06/24/2020

DW

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

CAS	Parameter	Results	MDL	SDL	MQL	MQLAdj	Flag	Units	Target	Bottle	Dilute
Drinking Water	**Ion Chromatography**										**EPA 300.0 2.1**
	Sulfate	**1550**	0.00775	0.775	0.300	30.0	P	**mg/L**	250 Secondary Standard	01	100.00

MDL is Method Detection Limit (40 CFR 136 Appendix B)
SDL is Sample Detection Limit and is the adjusted MDL (sample specific dilutions, dry weight)
MQL is the Method Quantitation Limit and corresponds to a low standard
MQLADJ is the Adjusted Method Quantitation Limit (dilutions, dry weight)

Qualifiers:

P - Spike recovery outside control limits due to matrix effects.

We report results on an As Received or wet basis unless marked Dry Weight. Unless otherwise noted, testing was performed at Ana-labs corporate laboratory that holds the following Federal and State certificates: EPA Lab Number TX00063, US Department of Agriculture Soil Import Permit P330-17-00117, Texas Commission on Environmental Quality Commercial Drinking Water Lab Approval (Lab ID: TX219), Texas Commission on Environmental Quality NELAP T104704201-20-17, Louisiana Department of Environmental Quality Laboratory Certification (NELAP, LELAP) #02008, Louisiana Department of Health and Hospitals Drinking Water (NELAP) Certificate No LA026, Oklahoma Department of Environmental Quality TNI Laboratory Accreditation Program Certificate No. 2018-126, Arkansas Department of Environmental Quality Certification #18-068-0. The Accredited column designates accreditation by N -- NELAC, or z -- not covered under NELAC scope of accreditation.
These analytical results relate to the sample tested. This report may NOT be reproduced EXCEPT in FULL without written approval of Ana-Lab Corp. Unless otherwise specified, these test results meet the requirements of NELAC.

Bill Peery

Bill Peery, MS, VP Technical Services

NELAP-accredited #T104704201-20-17

Quality Control

ANALAB
Testing the Limits of Science and Service

AQU5-C

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Project
925479

Printed 06/24/2020

Analytical Set 903039 — EPA 300.0 2.1

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Chloride	903039	0.037	0.0196	0.300	mg/L	121307694

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Chloride	10.3	10.0	mg/L	103	90.0 - 110	121307691
Chloride	10.2	10.0	mg/L	102	90.0 - 110	121307705
Chloride	10.3	10.0	mg/L	103	90.0 - 110	121307715

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Chloride	903039	4.96	4.98	5.00	85.0 - 110	99.2	99.6	mg/L	0.402	20.0

MSD

Parameter	Sample	MS	MSD	UNK	Known	Limits	MS%	MSD%	Units	RPD	Limit%
Chloride	1897471	138	136	83.7	50.0	80.0 - 120	109	105	mg/L	3.75	20.0
Chloride	1897597	33.5	33.6	24.8	10.0	80.0 - 120	87.0	88.0	mg/L	1.14	20.0

Analytical Set 903248 — EPA 300.0 2.1

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Sulfate	903248	0.061	0.00775	0.300	mg/L	121311989

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Sulfate	10.2	10.0	mg/L	102	90.0 - 110	121311986
Sulfate	10.3	10.0	mg/L	103	90.0 - 110	121312003
Sulfate	10.4	10.0	mg/L	104	90.0 - 110	121312016

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Sulfate	903248	4.90	4.77	5.00	88.0 - 110	98.0	95.4	mg/L	2.69	20.0

MSD

Parameter	Sample	MS	MSD	UNK	Known	Limits	MS%	MSD%	Units	RPD	Limit%
Sulfate	1898051	1400	1430	999	100	80.0 - 120	401 *	431 *	mg/L	7.21	20.0
Sulfate	1898052	1690	1670	1550	100	80.0 - 120	140 *	120	mg/L	15.4	20.0

* Out RPD is Relative Percent Difference: abs(r1-r2) / mean(r1,r2) * 100%

Recover% is Recovery Percent: result / known * 100%

Blank - Method Blank; CCV - Continuing Calibration Verification

NELAP-accredited #T104704201-20-17

AQUA-TECH LABORATORIES, INC.

ATL - Bryan Facility:
635 Phil Gramm Blvd.
Bryan, TX 77807
(979) 778-3707
Fax (979) 778-3193

ATL - Austin Facility:
7500 Hwy 71 W, Suite 105
Austin, TX 78735
(512) 301-9559
Fax (512) 301-9552

Chain-of-Custody & Analysis Request

T104704371

SHIPPED TO:
Ana-Lab Corp. (NELAP Cert. T104704201)
2600 Dudley Road
Kilgore, TX 75662
Phone: (903) 984-0551
Fax: (903) 984-5914

C-O-C #

398 - D019479

Page 1 of 1

All analyses must be performed by a TNI approved method certified by the TCEQ. Contact ATL's sample custodian via voice and email if your methods do not meet this criteria.

Analysis Request for:	**Sample ID: D019479-01**	Sampled: 06/16/20 13:00	Matrix: Drinking Water	**Laboratory ID >>** 1898051
Chloride - EPA 300.0	SO4 DW - EPA 300.0			
Analysis Request for:	**Sample ID: D019479-02**	Sampled: 06/16/20 14:00	Matrix: Drinking Water	**Laboratory ID >>** 052
Chloride - EPA 300.0	SO4 DW - EPA 300.0			

CONTAINERS SUPPLIED: (ATL indicates cooler number in parentheses for each container - only required if more than one cooler listed below.)

( ) D019479-01 [C] - Cl SO4 0.25LP

( ) D019479-02 [C] - Cl SO4 0.25LP

Relinquished by: (print & sign) [X] ATL-Austin [ ] ATL-Bryan [ ] Sampler			Date	Time	[ ] Iced [ ] Custody Sealed [ ] Not Chilled
Kelly Kukowski			6/18/20	15:52	
Carrier & Tracking Number:	Cooler 1: aqu5 -3533045				Sample Info "X" all that apply
Lone Star					
Received by: (print & sign) [X] Received in Lab			Date	Time	[X] Received Iced [1] CTU [X] Condition Good [ ] Not Rec'd Iced
Raushaun Thompson			6/19/20	0900	

Line below documents condition at receipt in lab (shipped to) listed above.

Cooler Temperature (°C)	Temp. Read (TR)	Corrected Temp. (CT)	Thermometer ID
Cooler 1			
N/A	N/A	N/A	

Please email reports to: reporting@aqua-techlabs.com

Please return cooler(s) to: Austin Facility

Abbreviations: DW - Drinking Water; NP - Non-Potable Water; S - Solid; CTU - Custody Transfer Unbroken; StP - Sterile Plastic; LP - Liter Plastic; LG - Liter Glass

Aqua-Tech Comments and Special Instructions

5 DAY TAT

See Attached for Tracking # and Temp

BRET

LSO
It's all in the delivery.

Airbill No. Z5833045

LSO
1-800-800-8984
www.lso.com

SHIP TO:
RECEIVING
ANA LAB CORP
2600 DUDLEY RD
KILGORE, TX 75662
9039840551

From:
KELLY KUKOWSKI
AQUA TECH LABS
7500 W HWY 71 STE 105
AUSTIN, TX 78735
5123019559

GGGG **LSO ECONOMY NEXT DAY**
3:00 IN MOST AREAS
LATER IN REMOTE AREAS

PRINT DATE: 6/11/2020 REF 3:
QUICKCODE: WEIGHT: 40.00LBS
REF 1: 1D00V.0000 REF 2:

6/14 0912 RT
Date Time Tech
Temp: 2.4/2.5 C
Therm#: 6093 Corr Fact: 0.1 C

Fold on above line and place shipping label in pouch on package. Please be sure the barcodes and addresses can be read and scanned. Shipping Instructions

1. Fold this page along the horizontal line above.
2. Place this Airbill in the shipping label pouch on the package you are shipping. Please be sure the barcodes and addresses can be read and scanned.
3. To locate a drop box near you, click on **Find A Drop Box** from the home page main menu.
4. To schedule a pickup, click on **Request Pickup**.

WARNING: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your Lone Star Overnight account number.

This label is valid for use for 3 months from the date printed. Use of expired labels may result in delayed billing and / or additional research charges. LIMIT OF LIABILITY: We are not responsible for claims in excess of $100 for any reason unless you: 1) declare a greater value (not to exceed $25,000); 2) pay an additional fee; 3) and document your actual loss in a timely manner. We will not pay any claim in excess of the actual loss. We are not liable for any special or consequential damages. Additional limitations of liability are contained in our current Service Guide. If you ask us to deliver a package without obtaining a delivery signature, you release us of all liability for claims resulting from such service. NO DELIVERY SIGNATURE WILL BE OBTAINED FOR 8:30 AM DELIVERIES OR RESIDENTIAL DELIVERIES.

1V

Email information for report date:
6/22/20 10:48

D019486

Apex Drilling

Attn: Michael Becker
apexdrilling.becker@yahoo.com

PO Box 867
Marble Falls, TX 78654

COVID-19 UPDATE:
Aqua-Tech understands the concerns our clients have about the impact of COVID-19. Although we cannot predict what government or supply chain restrictions might develop, we have no plans to cease or limit our field and lab services.

We are following CDC recommendations and taking precautions to keep our clients and employees safe. This includes additional sanitation procedures and implementation of enhanced procedures for sample receiving. ATL is asking clients to help by placing samples in designated areas and using provided sanitizer. We also request any client that may be ill or may have been exposed to COVID-19 to contact us before entering our facilities. We will work out an individualized receipt protocol in these cases.

Thank you for your business,
June M. Brien
Executive Technical Director

CORPORATE OFFICE
635 Phil Gramm Boulevard
Bryan, TX 77807
Phone: (979) 778-3707
Fax: (979) 778-3193

AQUA-TECH LABORATORIES, INC.

AUSTIN OFFICE
7500 Hwy 71 W, Suite 105
Austin, TX 78735
Phone: (512) 301-9559
Fax: (512) 301-9552

The analyses summarized in this report were performed by Aqua-Tech Laboratories, Inc. unless otherwise noted. Aqua-Tech Laboratories, Inc. holds accreditation from the State of Texas in accordance with TNI and/or through the TCEQ Drinking Water Commercial Laboratory Approval Program.

The following abbreviations indicate certification status:

NEL	TNI accredited parameter.
ANR	Accreditation not required by the State of Texas.
DWP	Accreditation through the TCEQ Drinking Water Commercial Laboratory Approval Program.
INF	Aqua-Tech Laboratories, Inc. is not accredited for this parameter. It is reported on an informational basis only.

Subcontracted data summarized in this report is indicated by "Sub" in the Lab column.

TCEQ DW Lab ID TX 239

General Definitions:

NR	Not Reported.
RPD	Relative Percent Difference.
% R	Percent Recovery.
dry	Results with the "dry" unit designation are reported on a "dry weight" basis.
SQL	The Sample Quantitation Limit is the value below which the parameter cannot reliably be detected. The SQL includes all sample preparations, dilutions and / or concentrations.
Adj MDL	The Adjusted Method Detection Limit is the MDL value adjusted for any sample dilutions or concentrations .
MDL	The Method Detection Limit is the lowest theoretical value that is statistically different from zero for a specific method, taking into account all preparation steps and instrument settings.

All samples are reported on an "as received" basis unless the designation "dry" is added to the reported unit.

Copies of Aqua-Tech Laboratories, Inc. procedures and individual sampling plans are available upon request. Note that samples are collected by Aqua-Tech Laboratories, Inc. personnel unless otherwise noted in the "Sample Collected" field of this report as "Client" or "CLT".

Samples included in this report were received in acceptable condition according to Aqua-Tech Laboratories, Inc. procedures and 40 CFR, Chapter I, Subchapter D, Part 136.3, TABLE II. - *Required containers, preservation techniques, and holding times*, unless otherwise noted in this report.

Record Retention:

All reports, raw data, and associated quality control data are kept on file for 10 years before being destroyed. Any client that would like copies of records must contact Aqua-Tech Laboratories, Inc. no later than six months prior to the scheduled disposal. An administrative fee for retrieval and distribution will apply.

This report was approved by:

June M. Brien, Technical Director

corp@aqua-techlabs.com www.aqua-techlabs.com

CORPORATE OFFICE
635 Phil Gramm Boulevard
Bryan, TX 77807
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AQUA-TECH LABORATORIES, INC.

AUSTIN OFFICE
7500 Hwy 71 W, Suite 105
Austin, TX 78735
Phone: (512) 301-9559
Fax: (512) 301-9552

Analytical Report

Apex Drilling

Report Printed: 6/22/20 10:48

D019486

RED OAK NO2

Collected: 06/16/20 13:00 by CLIENT
Received: 06/17/20 10:20 by Kelly Kukowski

Type: Grab
Matrix: Drinking Water
C-O-C #: D019479

Lab ID# D019486-01

	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
Microbiological Analyses											
Total Coliforms	**Absent**	N/A		N/A	**N/A**	N/A	*Austin*	06/17/20 17:07 MXB	SM9223 B 2004	M114769	NEL
Escherichia coli (E.coli)	**Absent**	N/A		N/A	**N/A**	N/A	*Austin*	06/17/20 17:07 MXB	SM9223 B 2004	M114769	NEL

RED OAK NO3

Collected: 06/16/20 14:00 by CLIENT
Received: 06/17/20 10:20 by Kelly Kukowski

Type: Grab
Matrix: Drinking Water
C-O-C #: D019479

Lab ID# D019486-02

	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
Microbiological Analyses											
Total Coliforms	**Absent**	N/A		N/A	**N/A**	N/A	*Austin*	06/17/20 17:07 MXB	SM9223 B 2004	M114769	NEL
Escherichia coli (E.coli)	**Absent**	N/A		N/A	**N/A**	N/A	*Austin*	06/17/20 17:07 MXB	SM9223 B 2004	M114769	NEL

Microbiological Analyses - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	Log10 Comparison Range	Control Limit	Batch	
Escherichia coli (E.coli) - SM9223 B 2004														*Austin*
Blank	Absent	N/A		N/A	N/A	06/17/20 17:07 MXB							M114769	
Duplicate	Absent	N/A		N/A	N/A	06/17/20 17:07 MXB		Absent				200	M114769	
Total Coliforms - SM9223 B 2004														*Austin*
Blank	Absent	N/A		N/A	N/A	06/17/20 17:07 MXB							M114769	
Duplicate	Absent	N/A		N/A	N/A	06/17/20 17:07 MXB		Absent				200	M114769	

Sample Preparation Summary

Sample	Method	Prepared	Lab	Bottle	Initial	Units	Final	Units	External Dilution Factor	Batch
D019486-01										
Escherichia coli (E.coli)	SM9223 B 2004	6/17/20 16:47 MXB	Austin	A	100	mL	100	mL	1	M114769
Total Coliforms	SM9223 B 2004	6/17/20 16:47 MXB	Austin	A	100	mL	100	mL	1	M114769
D019486-02										
Escherichia coli (E.coli)	SM9223 B 2004	6/17/20 16:47 MXB	Austin	A	100	mL	100	mL	1	M114769
Total Coliforms	SM9223 B 2004	6/17/20 16:47 MXB	Austin	A	100	mL	100	mL	1	M114769

Chain-of-Custody and Analysis Request

AQUA-TECH LABORATORIES, INC

Aqua-Tech Laboratories, Inc.

Austin	Bryan
7500 Hwy 71 W Suite 105 Austin, TX 78735 512.301.9559	635 Phil Gramm Blvd. Bryan, TX 77807 979.778.3707

T104704371
TX239

Test results meet all accreditation/certification requirements unless stated otherwise.

Work Order / C-O-C: DQ9479

Page 1 of 1

V-0023 R03

Client /Project:

Contact Info

Name: Apex Drilling
Address:
City: State: ZIP:
Phone / Email:

Definitions

DW - Drinking Water
NP - Non-Potable Water
S - Solid
CM - Custody Maintained
CTU - Custody Transfer Unbroken
CT - Corrected Temperature
SUB - Subcontracted Analysis
(+) Container Type
P - Plastic
G - Glass
T - Teflon©

By relinquishing the samples listed below to Aqua-Tech, the client agrees to the following terms.
Samples will be analyzed by a method that is within Aqua-Tech Laboratories' NELAC fields of accreditation. Analytes requiring a certified method that is not within Aqua-Tech's fields of accreditation will be subcontracted to a NELAC certified lab that is certified for that method. Clients will be notified of the subcontract lab's details. Other analytes not requiring accreditation will be analyzed by a compendial method. If a specific method is required, the client will note the method in the "Analysis Requested" column. The client approves all method modifications documented by Aqua-Tech or the subcontract lab. A current list of Aqua-Tech's NELAC fields of accreditation and other methods are available on request.

Sample Custody

Relinquished by (print & sign): W BECKER	☐ Sampler ☐ Client ☐ ATL Field	Date: 6-17-20 Time: 10:20	☐ Iced / Refrig ☐ Custody Sealed
Received by (print & sign):	☐ Client ☐ ATL Field	Date: Time:	☐ Iced / Refrig ☐ CM / CTU
Relinquished by (print & sign):	☐ Client ☐ ATL Field	Date: Time:	☐ Iced / Refrig ☐ CM / CTU
Received by (print & sign):	☐ Client ☐ ATL Field	Date: Time:	☐ Iced / Refrig ☐ CM / CTU
Relinquished by (print & sign):	☐ Client ☐ ATL Field	Date: Time:	☐ Iced / Refrig ☐ CM / CTU / sealed
Received by (print & sign): Kelly Kukowski	☑ Lab	Date: 6/17/20 Time: 1020	☐ Cond Good ☐ Iced / Refrig ☐ CM / CTU

Client Comments:

*** Preservatives**

1	< 6 °C (unfrozen)
2	H2SO4
3	HCl
4	HNO3
5	Na2S2O3
6	NaOH
7	

Receipt in Lab

Cooler ID :	Cet	
Temperature (°C) : read / CT	5.1/5.1 MACK	MACK
Preservation Correct ?	(YES) NO	YES NO
Post Preservatives ?	(YES) NO	YES NO
Thermometer ID :	07155770	
pH Paper ID :	07449483	

Lab Comments:

Field Sample ID (record field data for each sample in space below)	Start Date	Start Time	End Date	End Time	Composite Type	Sample Matrix	Container(s) Bottle Count	Volume (Size in L)	Type (+)	Preserv-ative(s) *	LAB USE ONLY BELOW (initials KL) Cooler ID	pH Check	SUB	WORK ORDER	Sample
RED OAK #2	6-16-20	13:00	—		G	DW	1	4	P	1	Cet	– Ana		DQ19479-01	A
Analysis Requested & Comments: Cl Cond F Fe NO3 Mn pH SO4 TDS Total Hadness															
RED OAK #2	6-16-20	13:00	—		G	DW	1	0.12	STP	1,5	Cet	–	–	DQ19486-01	A 8
Analysis Requested & Comments: Total Coliform P/A															
RED OAK #3	6-16-20	14:00	—		G	DW	1	4	P	1	Cet	– Ana		DQ19479-02	A
Analysis Requested & Comments: Cl Cond F Fe NO3 Mn pH SO4 TDS Total Hardness															
RED OAK #3	6-16-20	14:00	—		G	DW	1	0.12	STP	1,5	Cet	–	–	DQ19486-02A	9
Analysis Requested & Comments: Total Coliform P/A															
															Sample
Analysis Requested & Comments:															

Water Quality

Well No. 3

Email information for report date:
7/19/20 18:30

D019479

Apex Drilling

Attn: Michael Becker
apexdrilling.becker@yahoo.com

PO Box 867
Marble Falls, TX 78654

COVID-19 UPDATE:
Aqua-Tech understands the concerns our clients have about the impact of COVID-19. Although we cannot predict what government or supply chain restrictions might develop, we have no plans to cease or limit our field and lab services.

We are following CDC recommendations and taking precautions to keep our clients and employees safe. This includes additional sanitation procedures and implementation of enhanced procedures for sample receiving. ATL is asking clients to help by placing samples in designated areas and using provided sanitizer. We also request any client that may be ill or may have been exposed to COVID-19 to contact us before entering our facilities. We will work out an individualized receipt protocol in these cases.

Thank you for your business,
June M. Brien
Executive Technical Director

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The analyses summarized in this report were performed by Aqua-Tech Laboratories, Inc. unless otherwise noted. Aqua-Tech Laboratories, Inc. holds accreditation from the State of Texas in accordance with TNI and/or through the TCEQ Drinking Water Commercial Laboratory Approval Program.

The following abbreviations indicate certification status:

NEL	TNI accredited parameter.
ANR	Accreditation not required by the State of Texas.
DWP	Accreditation through the TCEQ Drinking Water Commercial Laboratory Approval Program.
INF	Aqua-Tech Laboratories, Inc. is not accredited for this parameter. It is reported on an informational basis only.

Subcontracted data summarized in this report is indicated by "Sub" in the Lab column.

TCEQ DW Lab ID TX 239

General Definitions:

NR	Not Reported.
RPD	Relative Percent Difference.
% R	Percent Recovery.
dry	Results with the "dry" unit designation are reported on a "dry weight" basis.
SQL	The Sample Quantitation Limit is the value below which the parameter cannot reliably be detected. The SQL includes all sample preparations, dilutions and / or concentrations.
Adj MDL	The Adjusted Method Detection Limit is the MDL value adjusted for any sample dilutions or concentrations .
MDL	The Method Detection Limit is the lowest theoretical value that is statistically different from zero for a specific method, taking into account all preparation steps and instrument settings.

All samples are reported on an "as received" basis unless the designation "dry" is added to the reported unit.

Copies of Aqua-Tech Laboratories, Inc. procedures and individual sampling plans are available upon request. Note that samples are collected by Aqua-Tech Laboratories, Inc. personnel unless otherwise noted in the "Sample Collected" field of this report as "Client" or "CLT".

Samples included in this report were received in acceptable condition according to Aqua-Tech Laboratories, Inc. procedures and 40 CFR, Chapter I, Subchapter D, Part 136.3, TABLE II. - *Required containers, preservation techniques, and holding times*, unless otherwise noted in this report.

Record Retention:

All reports, raw data, and associated quality control data are kept on file for 10 years before being destroyed. Any client that would like copies of records must contact Aqua-Tech Laboratories, Inc. no later than six months prior to the scheduled disposal. An administrative fee for retrieval and distribution will apply.

This report was approved by:

June M. Brien, Technical Director

corp@aqua-techlabs.com www.aqua-techlabs.com

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Analytical Report

Apex Drilling

Report Printed: **7/19/20** **18:30**

D019479

Apex Drilling RED OAK WELL 2

Collected: 06/16/20 13:00 by CLIENT
Received: 06/17/20 10:20 by Kelly Kukowski

Type: Grab | *Matrix*: Drinking Water | *C-O-C #*: D019479

Lab ID# D019479-01	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
General Chemistry											
Total Dissolved Solids	**2390**	mg/L		25.0	100	100	*Bryan*	06/19/20 08:30 MRH	SM2540 C 2011	M114825	NEL
Nitrate as N (NO3N)	**0.0201**	mg/L			0.0200	0.0200	*Austin*	06/18/20 14:35 JLL	SM4500-NO3-F 2011	[CALC]	NEL
Nitrite as N	**<0.01**	mg/L	G-01	0.002	0.002	0.01	*Austin*	06/17/20 08:35 JLL	SM4500 NO2- B 2011	M114717	NEL
Nitrate/Nitrite as N	**0.02**	mg/L		0.02	0.02	0.02	*Bryan*	06/18/20 14:35 JKA	SM4500-NO3-F 2011	M114798	ANR
Fluoride	**2.53**	mg/L		0.04	0.04	0.10	*Bryan*	06/23/20 18:33 MRH	SM4500-F C 2011	M115015	NEL
pH, Lab	**7.2**	S.U.	Hold-03		N/A	N/A	*Austin*	06/17/20 13:15 MSA	SM4500-H+ B 2011	M114754	DWP
Temperature @ pH Analysis	**22.2**	Deg. C			N/A	N/A	*Austin*	06/17/20 13:15 MSA	SM4500-H+ B 2011	M114754	DWP
Specific Conductance (adjusted to 25.0°C)	**3070**	uS/cm		2.00	5.00	5.00	*Bryan*	06/29/20 11:35 CJO	SM2510 B 2011	M115245	DWP,NEL
Metals (Total)											
Manganese	**8.85**	ug/L		0.108	0.135	0.625	*Bryan*	06/25/20 17:50 AOG	EPA 200.8 R5.4	M114997	NEL

D019479-01 - re-analysis	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
General Chemistry											
Total Hardness (EDTA) as CaCO3	**1300**	mg/L		1.00	5.00	5.00	*Bryan*	07/06/20 18:33 MRH	SM2340 C 2011	M115318	NEL
Metals (Total)											
Iron	**0.326**	mg/L		0.002	0.001	0.005	*Bryan*	07/10/20 16:47 PNS	EPA 200.7 R4.4	M115654	NEL

Please see the attached sub-contract report for sub-contracted analysis.

Apex Drilling RED OAK WELL 3

Collected: 06/16/20 14:00 by CLIENT
Received: 06/17/20 10:20 by Kelly Kukowski

Type: Grab | *Matrix*: Drinking Water | *C-O-C #*: D019479

Lab ID# D019479-02	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
General Chemistry											
Total Dissolved Solids	**2670**	mg/L		25.0	100	100	*Bryan*	06/19/20 08:30 MRH	SM2540 C 2011	M114826	NEL
Nitrate as N (NO3N)	**0.0958**	mg/L			0.0200	0.0200	*Austin*	06/18/20 14:35 JLL	SM4500-NO3-F 2011	[CALC]	NEL
Nitrite as N	**<0.01**	mg/L	J, G-01 (0.003)	0.002	0.002	0.01	*Austin*	06/17/20 08:35 JLL	SM4500 NO2- B 2011	M114717	NEL
Nitrate/Nitrite as N	**0.10**	mg/L		0.02	0.02	0.02	*Bryan*	06/18/20 14:35 JKA	SM4500-NO3-F 2011	M114798	ANR
Fluoride	**2.75**	mg/L		0.04	0.04	0.10	*Bryan*	06/23/20 18:33 MRH	SM4500-F C 2011	M115015	NEL
pH, Lab	**7.1**	S.U.	Hold-03		N/A	N/A	*Austin*	06/17/20 13:15 MSA	SM4500-H+ B 2011	M114754	DWP
Temperature @ pH Analysis	**22.5**	Deg. C			N/A	N/A	*Austin*	06/17/20 13:15 MSA	SM4500-H+ B 2011	M114754	DWP
Specific Conductance (adjusted to 25.0°C)	**3360**	uS/cm		2.00	5.00	5.00	*Bryan*	06/29/20 11:35 CJO	SM2510 B 2011	M115245	DWP,NEL
Metals (Total)											
Manganese	**11.9**	ug/L		0.108	0.135	0.625	*Bryan*	06/25/20 18:00 AOG	EPA 200.8 R5.4	M114997	NEL

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Analytical Report

Apex Drilling

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D019479

D019479-02 - re-analysis	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
General Chemistry											
Total Hardness (EDTA) as CaCO3	**1470**	mg/L		1.00	5.00	5.00	*Bryan*	07/06/20 18:33 MRH	SM2340 C 2011	M115318	*NEL*
Metals (Total)											
Iron	**0.124**	mg/L		0.002	0.001	0.005	*Bryan*	07/10/20 16:51 PNS	EPA 200.7 R4.4	M115654	*NEL*

Please see the attached sub-contract report for sub-contracted analysis.

Explanation of Notes

G-01	This sample was added to an analytical run already in progress. See the prep time for when this sample was added.
Hold-03	This parameter was outside of EPA holding at the time the sample was received in the laboratory.
J	Analyte detected below the SQL but above the MDL.

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Analytical Report

Apex Drilling

Report Printed: **7/19/20** **18:30**

D019479

General Chemistry - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Fluoride - SM4500-F C 2011														*Bryan*
Initial Cal Check	0.47	mg/L				06/23/20 18:33 MRH	0.428		110	90 - 110			2006259	
Blank	<0.10	mg/L		0.04	0.10	06/23/20 18:33 MRH							M115015	
LCS	0.83	mg/L		0.04	0.10	06/23/20 18:33 MRH	0.798		104	90 - 110			M115015	
LCS Dup	0.81	mg/L		0.04	0.10	06/23/20 18:33 MRH	0.798		101	90 - 110	3.05	6.23	M115015	
Matrix Spike	3.43	mg/L		0.04	0.10	06/23/20 18:33 MRH	0.798	2.53	113	78.1 - 125			M115015	
Matrix Spike Dup	3.46	mg/L		0.04	0.10	06/23/20 18:33 MRH	0.798	2.53	116	78.1 - 125	3.28	5.72	M115015	
MRL Check	0.10	mg/L		0.04	0.10	06/23/20 18:33 MRH	0.0998		98.0	73.4 - 118			M115015	
Nitrate/Nitrite as N - SM4500-NO3-F 2011														*Bryan*
Initial Cal Check	1.78	mg/L				06/18/20 14:35 JKA	1.69		106	90 - 110			2006218	
Low Cal Check	0.02	mg/L				06/18/20 14:35 JKA	0.0200		100	70 - 130			2006218	
Blank	<0.02	mg/L		0.02	0.02	06/18/20 14:35 JKA							M114798	
LCS	0.51	mg/L		0.02	0.02	06/18/20 14:35 JKA	0.500		102	91.3 - 109			M114798	
LCS Dup	0.51	mg/L		0.02	0.02	06/18/20 14:35 JKA	0.500		102	91.3 - 109	0.362	6.8	M114798	
Matrix Spike	1.91	mg/L		0.02	0.02	06/18/20 14:35 JKA	0.500	1.40	102	94.7 - 117			M114798	
Matrix Spike Dup	1.94	mg/L		0.02	0.02	06/18/20 14:35 JKA	0.500	1.40	108	94.7 - 117	5.53	8.65	M114798	
Nitrite as N - SM4500 NO2- B 2011														*Austin*
Blank	<0.01	mg/L		0.002	0.01	06/17/20 08:35 JLL							M114717	
LCS	0.08	mg/L		0.002	0.01	06/17/20 08:35 JLL	0.0800		100	90 - 110			M114717	
LCS	0.08	mg/L		0.002	0.01	06/17/20 08:35 JLL	0.0800		99.4	90 - 110			M114717	
LCS Dup	0.08	mg/L		0.002	0.01	06/17/20 08:35 JLL	0.0800		105	90 - 110	4.25	8.12	M114717	
LCS Dup	0.08	mg/L		0.002	0.01	06/17/20 08:35 JLL	0.0800		99.4	90 - 110	0.00	8.12	M114717	
Matrix Spike	0.08	mg/L		0.002	0.01	06/17/20 08:35 JLL	0.0800	<0.01	95.5	70.6 - 117			M114717	
Matrix Spike Dup	0.08	mg/L		0.002	0.01	06/17/20 08:35 JLL	0.0800	<0.01	95.5	70.6 - 117	0.00	8.18	M114717	
MRL Check	<0.01	mg/L	*J (0.009)*	0.002	0.01	06/17/20 08:35 JLL	0.0100		88.8	70 - 130			M114717	
pH, Lab - SM4500-H+ B 2011														*Austin*
Duplicate	7.7	Std Units				06/17/20 13:15 MSA		7.7			0.130	1.18	M114754	
Reference	7.0	Std Units				06/17/20 13:15 MSA	6.86		101	95 - 105			M114754	
Reference	9.2	Std Units				06/17/20 13:15 MSA	9.18		100	95 - 105			M114754	
Reference	7.0	Std Units				06/17/20 13:15 MSA	6.86		101	95 - 105			M114754	
Reference	9.2	Std Units				06/17/20 13:15 MSA	9.18		100	95 - 105			M114754	

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Analytical Report

Apex Drilling

Report Printed: **7/19/20** **18:30**

D019479

General Chemistry - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Specific Conductance (adjusted to 25.0°C) - SM2510 B 2011														*Bryan*
Initial Cal Check	447	uS/cm				06/29/20 11:35 CJO	437		102	85 - 115			2006330	
Blank	<2.00	uS/cm		2.00	2.00	06/29/20 11:35 CJO							M115245	
Duplicate	3300	uS/cm		5.00	5.00	06/29/20 11:35 CJO		3360			1.95	2	M115245	
LCS	1460	uS/cm		2.00	2.00	06/29/20 11:35 CJO	1410		103	90 - 110			M115245	
Total Dissolved Solids - SM2540 C 2011														*Bryan*
Blank	<25.0	mg/L		25.0	25.0	06/19/20 08:30 MRH							M114825	
Duplicate	276	mg/L		100	100	06/19/20 08:30 MRH		280			1.44	9.13	M114825	
Reference	488	mg/L		100	100	06/19/20 08:30 MRH	500		97.6	81 - 121			M114825	
Blank	<25.0	mg/L		25.0	25.0	06/19/20 08:30 MRH							M114826	
Duplicate	2680	mg/L		100	100	06/19/20 08:30 MRH		2670			0.150	9.13	M114826	
Reference	488	mg/L		100	100	06/19/20 08:30 MRH	500		97.6	81 - 121			M114826	
Total Hardness (EDTA) as CaCO3 - SM2340 C 2011														*Bryan*
Initial Cal Check	56.0	mg/L				06/26/20 06:30 MRH	54.4		103	85 - 115			2006305	
Initial Cal Check	50.0	mg/L				07/06/20 18:33 MRH	54.4		91.9	85 - 115			2007056	
Blank	<1.00	mg/L		1.00	1.00	07/06/20 18:33 MRH							M115318	
Duplicate	<1.00	mg/L		1.00	1.00	07/06/20 18:33 MRH		<1.00				9.52	M115318	
LCS	79.2	mg/L		1.00	1.00	07/06/20 18:33 MRH	80.0		99.0	90 - 110			M115318	
LCS Dup	79.2	mg/L		1.00	1.00	07/06/20 18:33 MRH	80.0		99.0	90 - 110	0.00	6.47	M115318	
Matrix Spike	89.6	mg/L		1.00	1.00	07/06/20 18:33 MRH	80.0	<1.00	112	85 - 115			M115318	
MRL Check	4.17	mg/L		1.00	1.00	07/06/20 18:33 MRH	4.00		104	70 - 130			M115318	

Metals (Total) - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Iron - EPA 200.7 R4.4														*Bryan*
Blank	<0.005	mg/L		0.001	0.005	07/10/20 16:31 PNS							M115654	
LCS	0.455	mg/L		0.001	0.005	07/10/20 16:34 PNS	0.500		90.9	84.5 - 115.4			M115654	
LCS Dup	0.482	mg/L		0.001	0.005	07/10/20 16:37 PNS	0.500		96.5	84.5 - 115.4	5.91	20	M115654	
Duplicate	0.141	mg/L		0.001	0.005	07/10/20 16:41 PNS		0.169			18.3	20	M115654	
Matrix Spike	0.593	mg/L		0.001	0.005	07/10/20 16:44 PNS	0.500	0.169	84.8	69.5 - 130.4			M115654	

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Metals (Total) - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Manganese - EPA 200.8 R5.4														*Bryan*
Blank	<0.625	ug/L		0.135	0.625	06/25/20 16:29 AOG							M114997	
LCS	4.29	ug/L		0.135	0.625	06/25/20 17:11 AOG	5.00		85.8	84.5 - 115.4			M114997	
LCS Dup	4.43	ug/L		0.135	0.625	06/25/20 17:21 AOG	5.00		88.6	84.5 - 115.4	3.24	20	M114997	
Duplicate	11.8	ug/L		0.135	0.625	06/25/20 17:30 AOG		11.9			0.615	20	M114997	
Matrix Spike	15.6	ug/L		0.135	0.625	06/25/20 17:40 AOG	5.00	11.9	74.9	69.5 - 130.4			M114997	

Preparation Procedures - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Turbidity - SM2130 B 2011														*Bryan*
Initial Cal Check	4.3	NTU				05/26/20 20:44 MRH	4.65		93.1	90 - 110			2005292	

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Analytical Report

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D019479

Sample Preparation Summary

Sample	Method	Prepared	Lab	Bottle	Initial	Units	Final	Units	External Dilution Factor	Batch
D019479-01										
Fluoride	SM4500-F C 2011	6/23/20 18:33 MRH	Bryan	D	25.0	mL	25.0	mL	1	M115015
Manganese	EPA 200.8 R5.4	6/23/20 15:17 AOG	Bryan	E	50.0	mL	25.0	mL	2.5	M114997
Nitrate/Nitrite as N	SM4500-NO3-F 2011	6/18/20 12:42 JKA	Bryan	B	10.0	mL	10.0	mL	1	M114798
Nitrite as N	SM4500 NO2- B 2011	6/17/20 13:40 JLL	Austin	A	25.0	mL	25.0	mL	1	M114717
pH, Lab	SM4500-H+ B 2011	6/17/20 13:15 MSA	Austin	A	50.0	mL	50.0	mL	1	M114754
Sample Acidified to pH<2 in Lab	N/A	6/17/20 10:47 KK	Bryan	E	100	mL	100	mL	1	M114743
Specific Conductance (adjusted to 25.0°C)	SM2510 B 2011	6/29/20 11:35 CJO	Bryan	D	20.0	mL	50.0	mL	1	M115245
Temperature @ pH Analysis	SM4500-H+ B 2011	6/17/20 13:15 MSA	Austin	A	50.0	mL	50.0	mL	1	M114754
Total Dissolved Solids	SM2540 C 2011	6/19/20 8:30 MRH	Bryan	D	25.0	mL	100	mL	1	M114825
Turbidity	SM2130 B 2011	6/19/20 13:42 BLC	Bryan	A	10.0	mL	10.0	mL	1	M114867
D019479-01RE1										
Iron	EPA 200.7 R4.4	7/8/20 17:55 BLC	Bryan	E	50.0	mL	25.0	mL	1	M115654
Sample Acidified to pH<2 in Lab	N/A	6/17/20 10:48 KK	Bryan	B	100	mL	100	mL	1	M114744
Total Hardness (EDTA) as CaCO3	SM2340 C 2011	6/30/20 15:25 BLC	Bryan	E	10.0	mL	50.0	mL	1	M115318
D019479-02										
Fluoride	SM4500-F C 2011	6/23/20 18:33 MRH	Bryan	D	25.0	mL	25.0	mL	1	M115015
Manganese	EPA 200.8 R5.4	6/23/20 15:17 AOG	Bryan	E	50.0	mL	25.0	mL	2.5	M114997
Nitrate/Nitrite as N	SM4500-NO3-F 2011	6/18/20 12:42 JKA	Bryan	B	10.0	mL	10.0	mL	1	M114798
Nitrite as N	SM4500 NO2- B 2011	6/17/20 13:40 JLL	Austin	A	25.0	mL	25.0	mL	1	M114717
pH, Lab	SM4500-H+ B 2011	6/17/20 13:15 MSA	Austin	A	50.0	mL	50.0	mL	1	M114754
Sample Acidified to pH<2 in Lab	N/A	6/17/20 10:47 KK	Bryan	E	100	mL	100	mL	1	M114743
Specific Conductance (adjusted to 25.0°C)	SM2510 B 2011	6/29/20 11:35 CJO	Bryan	D	20.0	mL	50.0	mL	1	M115245
Temperature @ pH Analysis	SM4500-H+ B 2011	6/17/20 13:15 MSA	Austin	A	50.0	mL	50.0	mL	1	M114754
Total Dissolved Solids	SM2540 C 2011	6/19/20 8:30 MRH	Bryan	D	25.0	mL	100	mL	1	M114826
Turbidity	SM2130 B 2011	6/19/20 13:42 BLC	Bryan	E	10.0	mL	10.0	mL	1	M114872
D019479-02RE1										
Iron	EPA 200.7 R4.4	7/8/20 17:55 BLC	Bryan	E	50.0	mL	25.0	mL	1	M115654
Sample Acidified to pH<2 in Lab	N/A	6/17/20 10:48 KK	Bryan	B	100	mL	100	mL	1	M114744
Total Hardness (EDTA) as CaCO3	SM2340 C 2011	6/30/20 15:25 BLC	Bryan	E	10.0	mL	50.0	mL	1	M115318

AQUA-TECH LABORATORIES, INC

Chain-of-Custody and Analysis Request

Aqua-Tech Laboratories, Inc.

Austin: 7500 Hwy 71 W Suite 105, Austin, TX 78735, 512.301.9559

Bryan: 635 Phil Gramm Blvd., Bryan, TX 77807, 979.778.3707

T104704371
TX239

Test results meet all accreditation/certification requirements unless stated otherwise.

Work Order / C-O-C: D019479

Page 1 of 1

V-0023 R03

Client /Project:

Contact Info
Name: Apex Drilling
Address
City / State / ZIP
Phone / Email

Definitions
DW - Drinking Water
NP - Non-Potable Water
S - Solid
CM - Custody Maintained
CTU - Custody Transfer Unbroken
CT - Corrected Temperature
SUB - Subcontracted Analysis

(+) Container Type
P - Plastic
G - Glass
T - Teflon©

By relinquishing the samples listed below to Aqua-Tech, the client agrees to the following terms.
Samples will be analyzed by a method that is within Aqua-Tech Laboratories' NELAC fields of accreditation. Analytes requiring a certified method that is not within Aqua-Tech's fields of accreditation will be subcontracted to a NELAC certified lab that is certified for that method. Clients will be notified of the subcontract lab's details. Other analytes not requiring accreditation will be analyzed by a compendial method. If a specific method is required, the client will note the method in the "Analysis Requested" column. The client approves all method modifications documented by Aqua-Tech or the subcontract lab. A current list of Aqua-Tech's NELAC fields of accreditation and other methods are available on request.

Sample Custody

			Date / Time	
Relinquished by (print & sign)	W BECKER	☐ Sampler ☐ Client ☐ ATL Field	Date 6-17-20 Time 10:20	☐ Iced / Refrig ☐ Custody Sealed
Received by (print & sign)		☐ Client ☐ ATL Field	Date Time	☐ Iced / Refrig ☐ CM / CTU
Relinquished by (print & sign)		☐ Client ☐ ATL Field	Date Time	☐ Iced / Refrig ☐ CM / CTU
Received by (print & sign)		☐ Client ☐ ATL Field	Date Time	☐ Iced / Refrig ☐ CM / CTU
Relinquished by (print & sign)		☐ Client ☐ ATL Field	Date Time	☐ Iced / Refrig ☐ CM / CTU / sealed
Received by (print & sign)	Kelly Kukowski	☑ Lab	Date 6/17/20 Time 1020	☑ Cond Good ☑ Iced / Refrig ☐ CM / CTU

Client Comments:

* Preservatives		Receipt in Lab		
1	< 6 °C (unfrozen)	Cooler ID :	Cet	
2	H2SO4	Temperature (°C) : read / CT	5.1/5.1	NA
3	HCl			
4	HNO3	Preservation Correct ?	YES NO	YES NO
5	Na2S2O3	Post Preservatives ?	YES NO	YES NO
6	NaOH	Thermometer ID :	0715570	
7		pH Paper ID :	0744943	

Lab Comments

Field Sample ID (record field data for each sample in space below)	Start Date	Start Time	End Date	End Time	Composite Type	Sample Matrix	Bottle Count	Volume (Size in L)	Type (+)	Preserv-ative(s) *	Cooler ID	pH Check	SUB	WORK ORDER (See Below)	Sample
RED OAK #2	6-16-20	13:00	—		G	DW	1	4	P	1	Cet	— Ana			A
Analysis Requested & Comments: Cl Cond F Fe NO3 Mn pH SO4 TDS Total Hardness											D019479-01				
RED OAK #2	6-16-20	13:00	—		G	DW	1	0.12	STP	1,5	Cet	—	—		A 8
Analysis Requested & Comments: Total Coliform P/A											D019486-01				
RED OAK #3	6-16-20	14:00	—		G	DW	1	4	P	1	Cet	— Ana			A
Analysis Requested & Comments: Cl Cond F Fe NO3 Mn pH SO4 TDS Total Hardness											D019479-02				
RED OAK #3	6-16-20	14:00	—		G	DW	1	0.12	STP	1,5	Cet	—	—		9
Analysis Requested & Comments: Total Coliform P/A											D019486-02A				
Analysis Requested & Comments:															

LAB USE ONLY BELOW (initials KK)

Ana-Lab Corp.
2600 Dudley Rd. Kilgore, Texas 75662
P.O. Box 9000 Kilgore, Texas 75663
*Office: 903-984-0551 * Fax: 903-984-5914*

ANA LAB
Testing the Limits of Science and Service

Project
925479

AQU5-C

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Printed 06/24/2020 9:22

TABLE OF CONTENTS

This report consists of this Table of Contents and the following pages:

NELAP-accredited #T104704201-20-17

Ana-Lab Corp.
2600 Dudley Rd. Kilgore, Texas 75662
P.O. Box 9000 Kilgore, Texas 75663
Office: 903-984-0551 * Fax: 903-984-5914

ANA LAB
Testing the Limits of Science and Service

AQU5-C

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Project
925479

Printed: 06/24/2020

Results

Sample Results

1898051 D019479-01 Received: 06/19/2020

Drinking Water Collected by: Client Aqua-Tech Laboratori PO:
Taken: 06/16/2020 13:00:00

EPA 300.0 2.1 Prepared: 903039 06/19/2020 19:24:00 Analyzed 903039 06/19/2020 19:24:00 KLB

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	Chloride	115	mg/L	3.00			01

EPA 300.0 2.1 Prepared: 903248 06/22/2020 12:47:00 Analyzed 903248 06/22/2020 12:47:00 ATN

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	Sulfate	999	mg/L	30.0	P		01

1898052 D019479-02 Received: 06/19/2020

Drinking Water Collected by: Client Aqua-Tech Laboratori PO:
Taken: 06/16/2020 14:00:00

EPA 300.0 2.1 Prepared: 903039 06/19/2020 19:49:00 Analyzed 903039 06/19/2020 19:49:00 KLB

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	Chloride	117	mg/L	3.00			01

EPA 300.0 2.1 Prepared: 903248 06/22/2020 17:44:00 Analyzed 903248 06/22/2020 17:44:00 ATN

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	Sulfate	1550	mg/L	30.0	P		01

NELAP-accredited #T104704201-20-17

Ana-Lab Corp.
2600 Dudley Rd. Kilgore, Texas 75662
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ANA LAB
Testing the Limits of Science and Service

AQU5-C

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Project
925479

Printed: 06/24/2020

Qualifiers:

P - Spike recovery outside control limits due to matrix effects.

We report results on an As Received or wet basis unless marked Dry Weight. Unless otherwise noted, testing was performed at Ana-labs corporate laboratory that holds the following Federal and State certificates: EPA Lab Number TX00063, US Department of Agriculture Soil Import Permit P330-17-00117, Texas Commission on Environmental Quality Commercial Drinking Water Lab Approval (Lab ID: TX219), Texas Commission on Environmental Quality NELAP T104704201-20-17, Louisiana Department of Environmental Quality Laboratory Certification (NELAP, LELAP) #02008, Louisiana Department of Health and Hospitals Drinking Water (NELAP) Certificate No LA026, Oklahoma Department of Environmental Quality TNI Laboratory Accreditation Program Certificate No. 2018-126, Arkansas Department of Environmental Quality Certification #18-068-0. The Accredited column designates accreditation by N -- NELAC, or z -- not covered under NELAC scope of accreditation.
These analytical results relate to the sample tested. This report may NOT be reproduced EXCEPT in FULL without written approval of Ana-Lab Corp. Unless otherwise specified, these test results meet the requirements of NELAC.
RL is the Reporting Limit (sample specific quantitation limit) and is at or above the Method Detection Limit (MDL). CAS is Chemical Abstract Service number. RL is our Reporting Limit, or Minimum Quantitation Level. The RL takes into account the Instrument Detection Limit (IDL), Method Detection Limit (MDL), and Practical Quantitation Limit (PQL), and any dilutions and/or concentrations performed during sample preparation (EQL). Our analytical result must be above this RL before we report a value in the 'Results' column of our report (without a 'J' flag). Otherwise, we report ND (Not Detected above RL), because the result is "<" (less than) the number in the RL column. MAL is Minimum Analytical Level and is typically from regulatory agencies. Unless we report a result in the result column, or interferences prevent it, we work to have our RL at or below the MAL.

Bill Peery, MS, VP Technical Services

NELAP-accredited #T104704201-20-17

2600 Dudley Rd. Kilgore, Texas 75662
P.O. Box 9000 Kilgore, Texas 75663
Office: 903-984-0551 * Fax: 903-984-5914

ANALAB
Testing the Limits of Science and Service

RESULTS

Project
925479

Printed 06/24/2020

DW

AQU5

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

CAS	Parameter	Results	MDL	SDL	MQL	MQLAdj	Flag	Units	Target	Bottle	Dilute
Drinking Water	**Ion Chromatography**										**EPA 300.0 2.1**
1898051	**D019479-01**										
		Collection:	06/16/2020	13:00:00	Client				*Received:*	06/19/2020	
	Prepared: ***903039***										
				Analyzed:	***903039***			6/19/20	19:24:00		
	Chloride	**115**	0.0196	0.196	0.300	3.00		**mg/L**	250 Secondary Standard	01	10.00
	Prepared: ***903248***										
				Analyzed:	***903248***			6/22/20	12:47:00		
	Sulfate	**999**	0.00775	0.775	0.300	30.0	P	**mg/L**	250 Secondary Standard	01	100.00
1898052	**D019479-02**										
		Collection:	06/16/2020	14:00:00	Client				*Received:*	06/19/2020	
	Prepared: ***903039***										
				Analyzed:	***903039***			6/19/20	19:49:00		
	Chloride	**117**	0.0196	0.196	0.300	3.00		**mg/L**	250 Secondary Standard	01	10.00
	Prepared: ***903248***										
				Analyzed:	***903248***			6/22/20	17:44:00		

NELAP-accredited #T104704201-20-17

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P.O. Box 9000 Kilgore, Texas 75663
Office: 903-984-0551 * Fax: 903-984-5914

ANA LAB
Testing the Limits of Science and Service

RESULTS

Project
925479

AQU5

Printed 06/24/2020

DW

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

CAS	Parameter	Results	MDL	SDL	MQL	MQLAdj	Flag	Units	Target	Bottle	Dilute
Drinking Water	**Ion Chromatography**										**EPA 300.0 2.1**
	Sulfate	**1550**	0.00775	0.775	0.300	30.0	P	**mg/L**	250 Secondary Standard	01	100.00

MDL is Method Detection Limit (40 CFR 136 Appendix B)
SDL is Sample Detection Limit and is the adjusted MDL (sample specific dilutions, dry weight)
MQL is the Method Quantitation Limit and corresponds to a low standard
MQLADJ is the Adjusted Method Quantitation Limit (dilutions, dry weight)

Qualifiers:

P - Spike recovery outside control limits due to matrix effects.

We report results on an As Received or wet basis unless marked Dry Weight. Unless otherwise noted, testing was performed at Ana-labs corporate laboratory that holds the following Federal and State certificates: EPA Lab Number TX00063, US Department of Agriculture Soil Import Permit P330-17-00117, Texas Commission on Environmental Quality Commercial Drinking Water Lab Approval (Lab ID: TX219), Texas Commission on Environmental Quality NELAP T104704201-20-17, Louisiana Department of Environmental Quality Laboratory Certification (NELAP, LELAP) #02008, Louisiana Department of Health and Hospitals Drinking Water (NELAP) Certificate No LA026, Oklahoma Department of Environmental Quality TNI Laboratory Accreditation Program Certificate No. 2018-126, Arkansas Department of Environmental Quality Certification #18-068-0. The Accredited column designates accreditation by N -- NELAC, or z -- not covered under NELAC scope of accreditation.
These analytical results relate to the sample tested. This report may NOT be reproduced EXCEPT in FULL without written approval of Ana-Lab Corp. Unless otherwise specified, these test results meet the requirements of NELAC.

Bill Peery

Bill Peery, MS, VP Technical Services

NELAP-accredited #T104704201-20-17

Quality Control

ANALAB
Testing the Limits of Science and Service

AQU5-C

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Project
925479

Printed 06/24/2020

Analytical Set 903039 — EPA 300.0 2.1

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Chloride	903039	0.037	0.0196	0.300	mg/L	121307694

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Chloride	10.3	10.0	mg/L	103	90.0 - 110	121307691
Chloride	10.2	10.0	mg/L	102	90.0 - 110	121307705
Chloride	10.3	10.0	mg/L	103	90.0 - 110	121307715

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Chloride	903039	4.96	4.98	5.00	85.0 - 110	99.2	99.6	mg/L	0.402	20.0

MSD

Parameter	Sample	MS	MSD	UNK	Known	Limits	MS%	MSD%	Units	RPD	Limit%
Chloride	1897471	138	136	83.7	50.0	80.0 - 120	109	105	mg/L	3.75	20.0
Chloride	1897597	33.5	33.6	24.8	10.0	80.0 - 120	87.0	88.0	mg/L	1.14	20.0

Analytical Set 903248 — EPA 300.0 2.1

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Sulfate	903248	0.061	0.00775	0.300	mg/L	121311989

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Sulfate	10.2	10.0	mg/L	102	90.0 - 110	121311986
Sulfate	10.3	10.0	mg/L	103	90.0 - 110	121312003
Sulfate	10.4	10.0	mg/L	104	90.0 - 110	121312016

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Sulfate	903248	4.90	4.77	5.00	88.0 - 110	98.0	95.4	mg/L	2.69	20.0

MSD

Parameter	Sample	MS	MSD	UNK	Known	Limits	MS%	MSD%	Units	RPD	Limit%
Sulfate	1898051	1400	1430	999	100	80.0 - 120	401 *	431 *	mg/L	7.21	20.0
Sulfate	1898052	1690	1670	1550	100	80.0 - 120	140 *	120	mg/L	15.4	20.0

* Out RPD is Relative Percent Difference: abs(r1-r2) / mean(r1,r2) * 100%

Recover% is Recovery Percent: result / known * 100%

Blank - Method Blank; CCV - Continuing Calibration Verification

NELAP-accredited #T104704201-20-17

AQUA-TECH LABORATORIES, INC.

ATL - Bryan Facility:
635 Phil Gramm Blvd.
Bryan, TX 77807
(979) 778-3707
Fax (979) 778-3193

ATL - Austin Facility:
7500 Hwy 71 W, Suite 105
Austin, TX 78735
(512) 301-9559
Fax (512) 301-9552

Chain-of-Custody & Analysis Request

T104704371

SHIPPED TO:
Ana-Lab Corp. (NELAP Cert. T104704201)
2600 Dudley Road
Kilgore, TX 75662
Phone: (903) 984-0551
Fax: (903) 984-5914

C-O-C #

398 - D019479

Page 1 of 1

All analyses must be performed by a TNI approved method certified by the TCEQ. Contact ATL's sample custodian via voice and email if your methods do not meet this criteria.

Analysis Request for:	**Sample ID: D019479-01**	Sampled: 06/16/20 13:00	Matrix: Drinking Water	**Laboratory ID >>** 1898051
Chloride - EPA 300.0	SO4 DW - EPA 300.0			
Analysis Request for:	**Sample ID: D019479-02**	Sampled: 06/16/20 14:00	Matrix: Drinking Water	**Laboratory ID >>** 052
Chloride - EPA 300.0	SO4 DW - EPA 300.0			

CONTAINERS SUPPLIED: (ATL indicates cooler number in parentheses for each container - only required if more than one cooler listed below.)

( ) D019479-01 [C] - Cl SO4 0.25LP

( ) D019479-02 [C] - Cl SO4 0.25LP

Relinquished by: (print & sign) [X] ATL-Austin [ ] ATL-Bryan [ ] Sampler			Date	Time	[ ] Iced [ ] Custody Sealed [ ] Not Chilled
Kelly Kukowski			6/18/20	15:52	
Carrier & Tracking Number:	Cooler 1: aqu5 -3533045				Sample Info "X" all that apply
Lone Star					
Received by: (print & sign) [X] Received in Lab			Date	Time	[X] Received Iced [1] CTU [X] Condition Good [ ] Not Rec'd Iced
Raushaun Thompson			6/19/20	0900	

Line below documents condition at receipt in lab (shipped to) listed above.

Cooler Temperature (°C)	Temp. Read (TR)	Corrected Temp. (CT)	Thermometer ID
Cooler 1			
N/A	N/A	N/A	

Please email reports to: reporting@aqua-techlabs.com

Please return cooler(s) to: Austin Facility

Abbreviations: DW - Drinking Water; NP - Non-Potable Water; S - Solid; CTU - Custody Transfer Unbroken; StP - Sterile Plastic; LP - Liter Plastic; LG - Liter Glass

Aqua-Tech Comments and Special Instructions

5 DAY TAT

See Attached for Tracking # and Temp

BRET

LSO
It's all in the delivery.

Airbill No. Z5833045

LSO
1-800-800-8984
www.lso.com

SHIP TO:
RECEIVING
ANA LAB CORP
2600 DUDLEY RD
KILGORE, TX 75662
9039840551

From:
KELLY KUKOWSKI
AQUA TECH LABS
7500 W HWY 71 STE 105
AUSTIN, TX 78735
5123019559

GGGG **LSO ECONOMY NEXT DAY**
3:00 IN MOST AREAS
LATER IN REMOTE AREAS

PRINT DATE: 6/11/2020 REF 3:
QUICKCODE: WEIGHT: 40.00LBS
REF 1: 1D00V.0000 REF 2:

6/14 0912 RT
Date Time Tech
Temp: 2.4/2.5 C
Therm#: 6093 Corr Fact: 0.1 C

Fold on above line and place shipping label in pouch on package. Please be sure the barcodes and addresses can be read and scanned. Shipping Instructions

1. Fold this page along the horizontal line above.
2. Place this Airbill in the shipping label pouch on the package you are shipping. Please be sure the barcodes and addresses can be read and scanned.
3. To locate a drop box near you, click on **Find A Drop Box** from the home page main menu.
4. To schedule a pickup, click on **Request Pickup**.

WARNING: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your Lone Star Overnight account number.

This label is valid for use for 3 months from the date printed. Use of expired labels may result in delayed billing and / or additional research charges. LIMIT OF LIABILITY: We are not responsible for claims in excess of $100 for any reason unless you: 1) declare a greater value (not to exceed $25,000); 2) pay an additional fee; 3) and document your actual loss in a timely manner. We will not pay any claim in excess of the actual loss. We are not liable for any special or consequential damages. Additional limitations of liability are contained in our current Service Guide. If you ask us to deliver a package without obtaining a delivery signature, you release us of all liability for claims resulting from such service. NO DELIVERY SIGNATURE WILL BE OBTAINED FOR 8:30 AM DELIVERIES OR RESIDENTIAL DELIVERIES.

1V

Email information for report date:
6/22/20 10:48

D019486

Apex Drilling

Attn: Michael Becker
apexdrilling.becker@yahoo.com

PO Box 867
Marble Falls, TX 78654

COVID-19 UPDATE:
Aqua-Tech understands the concerns our clients have about the impact of COVID-19. Although we cannot predict what government or supply chain restrictions might develop, we have no plans to cease or limit our field and lab services.

We are following CDC recommendations and taking precautions to keep our clients and employees safe. This includes additional sanitation procedures and implementation of enhanced procedures for sample receiving. ATL is asking clients to help by placing samples in designated areas and using provided sanitizer. We also request any client that may be ill or may have been exposed to COVID-19 to contact us before entering our facilities. We will work out an individualized receipt protocol in these cases.

Thank you for your business,
June M. Brien
Executive Technical Director

CORPORATE OFFICE
635 Phil Gramm Boulevard
Bryan, TX 77807
Phone: (979) 778-3707
Fax: (979) 778-3193

AQUA-TECH LABORATORIES, INC.

AUSTIN OFFICE
7500 Hwy 71 W, Suite 105
Austin, TX 78735
Phone: (512) 301-9559
Fax: (512) 301-9552

The analyses summarized in this report were performed by Aqua-Tech Laboratories, Inc. unless otherwise noted. Aqua-Tech Laboratories, Inc. holds accreditation from the State of Texas in accordance with TNI and/or through the TCEQ Drinking Water Commercial Laboratory Approval Program.

The following abbreviations indicate certification status:

NEL	TNI accredited parameter.
ANR	Accreditation not required by the State of Texas.
DWP	Accreditation through the TCEQ Drinking Water Commercial Laboratory Approval Program.
INF	Aqua-Tech Laboratories, Inc. is not accredited for this parameter. It is reported on an informational basis only.

Subcontracted data summarized in this report is indicated by "Sub" in the Lab column.

TCEQ DW Lab ID TX 239

General Definitions:

NR	Not Reported.
RPD	Relative Percent Difference.
% R	Percent Recovery.
dry	Results with the "dry" unit designation are reported on a "dry weight" basis.
SQL	The Sample Quantitation Limit is the value below which the parameter cannot reliably be detected. The SQL includes all sample preparations, dilutions and / or concentrations.
Adj MDL	The Adjusted Method Detection Limit is the MDL value adjusted for any sample dilutions or concentrations .
MDL	The Method Detection Limit is the lowest theoretical value that is statistically different from zero for a specific method, taking into account all preparation steps and instrument settings.

All samples are reported on an "as received" basis unless the designation "dry" is added to the reported unit.

Copies of Aqua-Tech Laboratories, Inc. procedures and individual sampling plans are available upon request. Note that samples are collected by Aqua-Tech Laboratories, Inc. personnel unless otherwise noted in the "Sample Collected" field of this report as "Client" or "CLT".

Samples included in this report were received in acceptable condition according to Aqua-Tech Laboratories, Inc. procedures and 40 CFR, Chapter I, Subchapter D, Part 136.3, TABLE II. - *Required containers, preservation techniques, and holding times*, unless otherwise noted in this report.

Record Retention:

All reports, raw data, and associated quality control data are kept on file for 10 years before being destroyed. Any client that would like copies of records must contact Aqua-Tech Laboratories, Inc. no later than six months prior to the scheduled disposal. An administrative fee for retrieval and distribution will apply.

This report was approved by:

June M. Brien, Technical Director

corp@aqua-techlabs.com www.aqua-techlabs.com

CORPORATE OFFICE
635 Phil Gramm Boulevard
Bryan, TX 77807
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AQUA-TECH LABORATORIES, INC.

AUSTIN OFFICE
7500 Hwy 71 W, Suite 105
Austin, TX 78735
Phone: (512) 301-9559
Fax: (512) 301-9552

Analytical Report

Apex Drilling

Report Printed: 6/22/20 10:48

D019486

RED OAK NO2

Collected: 06/16/20 13:00 by CLIENT
Received: 06/17/20 10:20 by Kelly Kukowski

Type: Grab
Matrix: Drinking Water
C-O-C #: D019479

Lab ID# D019486-01

	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
Microbiological Analyses											
Total Coliforms	**Absent**	N/A		N/A	**N/A**	N/A	*Austin*	06/17/20 17:07 MXB	SM9223 B 2004	M114769	NEL
Escherichia coli (E.coli)	**Absent**	N/A		N/A	**N/A**	N/A	*Austin*	06/17/20 17:07 MXB	SM9223 B 2004	M114769	NEL

RED OAK NO3

Collected: 06/16/20 14:00 by CLIENT
Received: 06/17/20 10:20 by Kelly Kukowski

Type: Grab
Matrix: Drinking Water
C-O-C #: D019479

Lab ID# D019486-02

	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
Microbiological Analyses											
Total Coliforms	**Absent**	N/A		N/A	**N/A**	N/A	*Austin*	06/17/20 17:07 MXB	SM9223 B 2004	M114769	NEL
Escherichia coli (E.coli)	**Absent**	N/A		N/A	**N/A**	N/A	*Austin*	06/17/20 17:07 MXB	SM9223 B 2004	M114769	NEL

Microbiological Analyses - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	Log10 Comparison Range	Control Limit	Batch	
Escherichia coli (E.coli) - SM9223 B 2004														*Austin*
Blank	Absent	N/A		N/A	N/A	06/17/20 17:07 MXB							M114769	
Duplicate	Absent	N/A		N/A	N/A	06/17/20 17:07 MXB		Absent				200	M114769	
Total Coliforms - SM9223 B 2004														*Austin*
Blank	Absent	N/A		N/A	N/A	06/17/20 17:07 MXB							M114769	
Duplicate	Absent	N/A		N/A	N/A	06/17/20 17:07 MXB		Absent				200	M114769	

Sample Preparation Summary

Sample	Method	Prepared	Lab	Bottle	Initial	Units	Final	Units	External Dilution Factor	Batch
D019486-01										
Escherichia coli (E.coli)	SM9223 B 2004	6/17/20 16:47 MXB	Austin	A	100	mL	100	mL	1	M114769
Total Coliforms	SM9223 B 2004	6/17/20 16:47 MXB	Austin	A	100	mL	100	mL	1	M114769
D019486-02										
Escherichia coli (E.coli)	SM9223 B 2004	6/17/20 16:47 MXB	Austin	A	100	mL	100	mL	1	M114769
Total Coliforms	SM9223 B 2004	6/17/20 16:47 MXB	Austin	A	100	mL	100	mL	1	M114769

Chain-of-Custody and Analysis Request

AQUA-TECH LABORATORIES, INC

Aqua-Tech Laboratories, Inc.

Austin	Bryan
7500 Hwy 71 W Suite 105 Austin, TX 78735 512.301.9559	635 Phil Gramm Blvd. Bryan, TX 77807 979.778.3707

T104704371
TX239

Test results meet all accreditation/certification requirements unless stated otherwise.

Work Order / C-O-C: DQ9479

Page 1 of 1

V-0023 R03

Client /Project:

Contact Info

Name: Apex Drilling
Address:
City: State: ZIP:
Phone / Email:

Definitions

DW - Drinking Water
NP - Non-Potable Water
S - Solid
CM - Custody Maintained
CTU - Custody Transfer Unbroken
CT - Corrected Temperature
SUB - Subcontracted Analysis
(+) Container Type
P - Plastic
G - Glass
T - Teflon©

By relinquishing the samples listed below to Aqua-Tech, the client agrees to the following terms.
Samples will be analyzed by a method that is within Aqua-Tech Laboratories' NELAC fields of accreditation. Analytes requiring a certified method that is not within Aqua-Tech's fields of accreditation will be subcontracted to a NELAC certified lab that is certified for that method. Clients will be notified of the subcontract lab's details. Other analytes not requiring accreditation will be analyzed by a compendial method. If a specific method is required, the client will note the method in the "Analysis Requested" column. The client approves all method modifications documented by Aqua-Tech or the subcontract lab. A current list of Aqua-Tech's NELAC fields of accreditation and other methods are available on request.

Sample Custody

Relinquished by (print & sign): W BECKER	☐ Sampler ☐ Client ☐ ATL Field	Date: 6-17-20 Time: 10:20	☐ Iced / Refrig ☐ Custody Sealed
Received by (print & sign):	☐ Client ☐ ATL Field	Date: Time:	☐ Iced / Refrig ☐ CM / CTU
Relinquished by (print & sign):	☐ Client ☐ ATL Field	Date: Time:	☐ Iced / Refrig ☐ CM / CTU
Received by (print & sign):	☐ Client ☐ ATL Field	Date: Time:	☐ Iced / Refrig ☐ CM / CTU
Relinquished by (print & sign):	☐ Client ☐ ATL Field	Date: Time:	☐ Iced / Refrig ☐ CM / CTU / sealed
Received by (print & sign): Kelly Kukowski	☑ Lab	Date: 6/17/20 Time: 1020	☐ Cond Good ☐ Iced / Refrig ☐ CM / CTU

Client Comments:

*** Preservatives**

1	< 6 °C (unfrozen)
2	H2SO4
3	HCl
4	HNO3
5	Na2S2O3
6	NaOH
7	

Receipt in Lab

Cooler ID :	Cet	
Temperature (°C) : read / CT	5.1/5.1 MACK	MACK
Preservation Correct ?	(YES) NO	YES NO
Post Preservatives ?	(YES) NO	YES NO
Thermometer ID :	07155770	
pH Paper ID :	07449483	

Lab Comments:

Field Sample ID (record field data for each sample in space below)	Start Date	Start Time	End Date	End Time	Composite Type	Sample Matrix	Container(s) Bottle Count	Volume (Size in L)	Type (+)	Preserv-ative(s) *	LAB USE ONLY BELOW (initials KL) Cooler ID	pH Check	SUB	WORK ORDER	Sample
RED OAK #2	6-16-20	13:00	—		G	DW	1	4	P	1	Cet	– Ana		DQ19479-01	A
Analysis Requested & Comments: Cl Cond F Fe NO3 Mn pH SO4 TDS Total Hadness															
RED OAK #2	6-16-20	13:00	—		G	DW	1	0.12	STP	1,5	Cet	–	–	DQ19486-01	A 8
Analysis Requested & Comments: Total Coliform P/A															
RED OAK #3	6-16-20	14:00	—		G	DW	1	4	P	1	Cet	– Ana		DQ19479-02	A
Analysis Requested & Comments: Cl Cond F Fe NO3 Mn pH SO4 TDS Total Hardness															
RED OAK #3	6-16-20	14:00	—		G	DW	1	0.12	STP	1,5	Cet	–	–	DQ19486-02A	9
Analysis Requested & Comments: Total Coliform P/A															
															Sample
Analysis Requested & Comments:															

Water Quality

Well No. 5

Email information for report date:
7/13/20 08:09

D020305

Apex Drilling

Attn: Michael Becker
apexdrilling.becker@yahoo.com

PO Box 867
Marble Falls, TX 78654

COVID-19 UPDATE:
Aqua-Tech understands the concerns our clients have about the impact of COVID-19. Although we cannot predict what government or supply chain restrictions might develop, we have no plans to cease or limit our field and lab services.

We are following CDC recommendations and taking precautions to keep our clients and employees safe. This includes additional sanitation procedures and implementation of enhanced procedures for sample receiving. ATL is asking clients to help by placing samples in designated areas and using provided sanitizer. We also request any client that may be ill or may have been exposed to COVID-19 to contact us before entering our facilities. We will work out an individualized receipt protocol in these cases.

Thank you for your business,
June M. Brien
Executive Technical Director

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The analyses summarized in this report were performed by Aqua-Tech Laboratories, Inc. unless otherwise noted. Aqua-Tech Laboratories, Inc. holds accreditation from the State of Texas in accordance with TNI and/or through the TCEQ Drinking Water Commercial Laboratory Approval Program.

The following abbreviations indicate certification status:

NEL	TNI accredited parameter.
ANR	Accreditation not required by the State of Texas.
DWP	Accreditation through the TCEQ Drinking Water Commercial Laboratory Approval Program.
INF	Aqua-Tech Laboratories, Inc. is not accredited for this parameter. It is reported on an informational basis only.

Subcontracted data summarized in this report is indicated by "Sub" in the Lab column.

TCEQ DW Lab ID TX 239

General Definitions:

NR	Not Reported.
RPD	Relative Percent Difference.
% R	Percent Recovery.
dry	Results with the "dry" unit designation are reported on a "dry weight" basis.
SQL	The Sample Quantitation Limit is the value below which the parameter cannot reliably be detected. The SQL includes all sample preparations, dilutions and / or concentrations.
Adj MDL	The Adjusted Method Detection Limit is the MDL value adjusted for any sample dilutions or concentrations .
MDL	The Method Detection Limit is the lowest theoretical value that is statistically different from zero for a specific method, taking into account all preparation steps and instrument settings.

All samples are reported on an "as received" basis unless the designation "dry" is added to the reported unit.

Copies of Aqua-Tech Laboratories, Inc. procedures and individual sampling plans are available upon request. Note that samples are collected by Aqua-Tech Laboratories, Inc. personnel unless otherwise noted in the "Sample Collected" field of this report as "Client" or "CLT".

Samples included in this report were received in acceptable condition according to Aqua-Tech Laboratories, Inc. procedures and 40 CFR, Chapter I, Subchapter D, Part 136.3, TABLE II. - *Required containers, preservation techniques, and holding times*, unless otherwise noted in this report.

Record Retention:

All reports, raw data, and associated quality control data are kept on file for 10 years before being destroyed. Any client that would like copies of records must contact Aqua-Tech Laboratories, Inc. no later than six months prior to the scheduled disposal. An administrative fee for retrieval and distribution will apply.

This report was approved by:

June M. Brien, Technical Director

corp@aqua-techlabs.com www.aqua-techlabs.com

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Analytical Report

Apex Drilling

Report Printed: **7/13/20** **8:09**

D020305

Apex Drilling RED OAK WELL 5

Collected: 06/23/20 10:00 by CLIENT
Received: 06/23/20 15:20 by Christie Tonnu

Type: Grab | *Matrix*: Drinking Water | *C-O-C #*: D020305-7

Lab ID# D020305-01	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
General Chemistry											
Total Dissolved Solids	**3480**	mg/L		25.0	100	100	*Bryan*	06/26/20 12:05 MRH	SM2540 C 2011	M115175	NEL
Nitrate as N (NO3N)	**<0.0200**	mg/L			0.0200	0.0200	*Austin*	06/25/20 11:24 JLL	SM4500-NO3-F 2011	[CALC]	NEL
Nitrite as N	**<0.01**	mg/L		0.002	0.002	0.01	*Austin*	06/24/20 10:25 JLL	SM4500 NO2- B 2011	M115043	NEL
Nitrate/Nitrite as N	**<0.02**	mg/L		0.02	0.02	0.02	*Bryan*	06/25/20 11:24 MRB	SM4500-NO3-F 2011	M115113	ANR
Total Hardness (EDTA) as CaCO3	**1700**	mg/L		1.00	10.0	10.0	*Bryan*	06/26/20 06:30 MRH	SM2340 C 2011	M115149	NEL
Fluoride	**2.47**	mg/L		0.04	0.04	0.10	*Bryan*	06/23/20 18:33 MRH	SM4500-F C 2011	M115015	NEL
pH, Lab	**7.7**	S.U.	Hold-03		N/A	N/A	*Austin*	06/24/20 13:30 MSA	SM4500-H+ B 2011	M115059	DWP
Temperature @ pH Analysis	**22.0**	Deg. C			N/A	N/A	*Austin*	06/24/20 13:30 MSA	SM4500-H+ B 2011	M115059	DWP
Specific Conductance (adjusted to 25.0°C)	**3.26**	uS/cm		2.00	2.00	2.00	*Bryan*	06/29/20 11:35 CJO	SM2510 B 2011	M115245	DWP,NEL
Metals (Total)											
Iron	**0.283**	mg/L		0.002	0.002	0.010	*Bryan*	06/29/20 16:59 PNS	EPA 200.7 R4.4	M115074	NEL
Manganese	**6.28**	ug/L		0.108	0.111	0.515	*Bryan*	06/26/20 06:35 AOG	EPA 200.8 R5.4	M115116	NEL

Apex Drilling RED OAK WELL 8

Collected: 06/23/20 12:00 by CLIENT
Received: 06/23/20 15:20 by Christie Tonnu

Type: Grab | *Matrix*: Drinking Water | *C-O-C #*: D020305-7

Lab ID# D020305-02	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
General Chemistry											
Total Dissolved Solids	**2600**	mg/L		25.0	100	100	*Bryan*	06/26/20 12:05 MRH	SM2540 C 2011	M115175	NEL
Nitrate as N (NO3N)	**<0.0200**	mg/L			0.0200	0.0200	*Austin*	06/25/20 11:24 JLL	SM4500-NO3-F 2011	[CALC]	NEL
Nitrite as N	**<0.01**	mg/L	J (0.004)	0.002	0.002	0.01	*Austin*	06/24/20 10:25 JLL	SM4500 NO2- B 2011	M115043	NEL
Nitrate/Nitrite as N	**<0.02**	mg/L		0.02	0.02	0.02	*Bryan*	06/25/20 11:24 MRB	SM4500-NO3-F 2011	M115113	ANR
Fluoride	**2.34**	mg/L		0.04	0.04	0.10	*Bryan*	06/23/20 18:33 MRH	SM4500-F C 2011	M115015	NEL
pH, Lab	**7.5**	S.U.	Hold-03		N/A	N/A	*Austin*	06/24/20 13:30 MSA	SM4500-H+ B 2011	M115059	DWP
Temperature @ pH Analysis	**21.5**	Deg. C			N/A	N/A	*Austin*	06/24/20 13:30 MSA	SM4500-H+ B 2011	M115059	DWP
Specific Conductance (adjusted to 25.0°C)	**3250**	uS/cm		2.00	5.00	5.00	*Bryan*	06/29/20 11:35 CJO	SM2510 B 2011	M115245	DWP,NEL
Metals (Total)											
Iron	**0.307**	mg/L		0.002	0.001	0.005	*Bryan*	07/02/20 21:18 PNS	EPA 200.7 R4.4	M115067	NEL
Manganese	**10.2**	ug/L		0.108	0.135	0.500	*Bryan*	07/09/20 15:43 AOG	EPA 200.8 R5.4	M115202	NEL

D020305-02 - re-analysis	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
General Chemistry											
Total Hardness (EDTA) as CaCO3	**1470**	mg/L		1.00	5.00	5.00	*Bryan*	07/06/20 18:33 MRH	SM2340 C 2011	M115318	NEL

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Explanation of Notes

Hold-03	This parameter was outside of EPA holding at the time the sample was received in the laboratory.
J	Analyte detected below the SQL but above the MDL.

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Analytical Report

Apex Drilling

Report Printed: **7/13/20** **8:09**

D020305

General Chemistry - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Fluoride - SM4500-F C 2011														*Bryan*
Initial Cal Check	0.47	mg/L				06/23/20 18:33 MRH	0.428		110	90 - 110			2006259	
Blank	<0.10	mg/L		0.04	0.10	06/23/20 18:33 MRH							M115015	
LCS	0.83	mg/L		0.04	0.10	06/23/20 18:33 MRH	0.798		104	90 - 110			M115015	
LCS Dup	0.81	mg/L		0.04	0.10	06/23/20 18:33 MRH	0.798		101	90 - 110	3.05	6.23	M115015	
Matrix Spike	3.43	mg/L		0.04	0.10	06/23/20 18:33 MRH	0.798	2.53	113	78.1 - 125			M115015	
Matrix Spike Dup	3.46	mg/L		0.04	0.10	06/23/20 18:33 MRH	0.798	2.53	116	78.1 - 125	3.28	5.72	M115015	
MRL Check	0.10	mg/L		0.04	0.10	06/23/20 18:33 MRH	0.0998		98.0	73.4 - 118			M115015	
Nitrate/Nitrite as N - SM4500-NO3-F 2011														*Bryan*
Initial Cal Check	1.78	mg/L				06/25/20 11:24 MRB	1.69		106	90 - 110			2006295	
Low Cal Check	0.02	mg/L				06/25/20 11:24 MRB	0.0200		100	70 - 130			2006295	
Blank	<0.02	mg/L		0.02	0.02	06/25/20 11:24 MRB							M115113	
LCS	0.50	mg/L		0.02	0.02	06/25/20 11:24 MRB	0.500		99.7	91.3 - 109			M115113	
LCS Dup	0.50	mg/L		0.02	0.02	06/25/20 11:24 MRB	0.500		101	91.3 - 109	0.940	6.8	M115113	
Matrix Spike	0.87	mg/L		0.02	0.02	06/25/20 11:24 MRB	0.500	0.35	104	94.7 - 117			M115113	
Matrix Spike Dup	0.88	mg/L		0.02	0.02	06/25/20 11:24 MRB	0.500	0.35	107	94.7 - 117	2.99	8.65	M115113	
Nitrite as N - SM4500 NO2- B 2011														*Austin*
Blank	<0.01	mg/L		0.002	0.01	06/24/20 10:25 JLL							M115043	
LCS	0.08	mg/L		0.002	0.01	06/24/20 10:25 JLL	0.0800		105	90 - 110			M115043	
LCS Dup	0.08	mg/L		0.002	0.01	06/24/20 10:25 JLL	0.0800		102	90 - 110	2.94	8.12	M115043	
Matrix Spike	0.08	mg/L		0.002	0.01	06/24/20 10:25 JLL	0.0800	<0.01	98.1	70.6 - 117			M115043	
Matrix Spike Dup	0.08	mg/L		0.002	0.01	06/24/20 10:25 JLL	0.0800	<0.01	97.6	70.6 - 117	0.444	8.18	M115043	
MRL Check	<0.01	mg/L	*J (0.009)*	0.002	0.01	06/24/20 10:25 JLL	0.0100		92.3	70 - 130			M115043	
pH, Lab - SM4500-H+ B 2011														*Austin*
Duplicate	7.8	Std Units				06/24/20 13:30 MSA		7.7			0.129	1.18	M115059	
Reference	7.0	Std Units				06/24/20 13:30 MSA	6.86		101	95 - 105			M115059	
Reference	9.2	Std Units				06/24/20 13:30 MSA	9.18		99.9	95 - 105			M115059	
Reference	7.0	Std Units				06/24/20 13:30 MSA	6.86		101	95 - 105			M115059	
Reference	9.2	Std Units				06/24/20 13:30 MSA	9.18		99.8	95 - 105			M115059	
Specific Conductance (adjusted to 25.0°C) - SM2510 B 2011														*Bryan*
Initial Cal Check	447	uS/cm				06/29/20 11:35 CJO	437		102	85 - 115			2006330	
Blank	<2.00	uS/cm		2.00	2.00	06/29/20 11:35 CJO							M115245	
Duplicate	3300	uS/cm		5.00	5.00	06/29/20 11:35 CJO		3360			1.95	2	M115245	
LCS	1460	uS/cm		2.00	2.00	06/29/20 11:35 CJO	1410		103	90 - 110			M115245	

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Analytical Report

Apex Drilling

Report Printed: **7/13/20** **8:09**

D020305

General Chemistry - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Total Dissolved Solids - SM2540 C 2011														*Bryan*
Blank	<25.0	mg/L		25.0	25.0	06/26/20 12:05 MRH							M115175	
Duplicate	280	mg/L		100	100	06/26/20 12:05 MRH		280			0.00	9.13	M115175	
Reference	528	mg/L		100	100	06/26/20 12:05 MRH	500		106	81 - 121			M115175	
Total Hardness (EDTA) as CaCO3 - SM2340 C 2011														*Bryan*
Initial Cal Check	56.0	mg/L				06/26/20 06:30 MRH	54.4		103	85 - 115			2006305	
Blank	<1.00	mg/L		1.00	1.00	06/26/20 06:30 MRH							M115149	
Duplicate	156	mg/L		1.00	1.00	06/26/20 06:30 MRH		156			0.00	9.52	M115149	
LCS	102	mg/L		1.00	1.00	06/26/20 06:30 MRH	100		102	90 - 110			M115149	
LCS Dup	96.0	mg/L		1.00	1.00	06/26/20 06:30 MRH	100		96.0	90 - 110	6.06	6.47	M115149	
Matrix Spike	260	mg/L		1.00	1.00	06/26/20 06:30 MRH	100	156	104	87.6 - 111			M115149	
MRL Check	4.00	mg/L		1.00	1.00	06/26/20 06:30 MRH	4.00		100	70 - 130			M115149	
Initial Cal Check	50.0	mg/L				07/06/20 18:33 MRH	54.4		91.9	85 - 115			2007056	
Blank	<1.00	mg/L		1.00	1.00	07/06/20 18:33 MRH							M115318	
Duplicate	<1.00	mg/L		1.00	1.00	07/06/20 18:33 MRH		<1.00				9.52	M115318	
LCS	79.2	mg/L		1.00	1.00	07/06/20 18:33 MRH	80.0		99.0	90 - 110			M115318	
LCS Dup	79.2	mg/L		1.00	1.00	07/06/20 18:33 MRH	80.0		99.0	90 - 110	0.00	6.47	M115318	
Matrix Spike	89.6	mg/L		1.00	1.00	07/06/20 18:33 MRH	80.0	<1.00	112	85 - 115			M115318	
MRL Check	4.17	mg/L		1.00	1.00	07/06/20 18:33 MRH	4.00		104	70 - 130			M115318	

Metals (Total) - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Iron - EPA 200.7 R4.4														*Bryan*
Blank	<0.010	mg/L		0.002	0.010	06/29/20 16:42 PNS							M115074	
LCS	1.08	mg/L		0.002	0.010	06/29/20 16:45 PNS	1.00		108	84.5 - 115.4			M115074	
LCS Dup	1.05	mg/L		0.002	0.010	06/29/20 16:49 PNS	1.00		105	84.5 - 115.4	3.50	20	M115074	
Duplicate	0.288	mg/L		0.002	0.010	06/29/20 16:52 PNS		0.283			1.76	20	M115074	
Matrix Spike	1.27	mg/L		0.002	0.010	06/29/20 16:56 PNS	1.00	0.283	99.0	69.5 - 130.4			M115074	
Blank	<0.005	mg/L		0.001	0.005	07/02/20 20:58 PNS							M115067	
LCS	0.473	mg/L		0.001	0.005	07/02/20 21:01 PNS	0.500		94.7	84.5 - 115.4			M115067	
LCS Dup	0.465	mg/L		0.001	0.005	07/02/20 21:04 PNS	0.500		93.1	84.5 - 115.4	1.69	20	M115067	
Duplicate	0.271	mg/L		0.001	0.005	07/02/20 21:07 PNS		0.307			12.5	20	M115067	
Matrix Spike	0.809	mg/L		0.001	0.005	07/02/20 21:11 PNS	0.500	0.307	101	69.5 - 130.4			M115067	

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AQUA-TECH LABORATORIES, INC.

AUSTIN OFFICE
7500 Hwy 71 W, Suite 105
Austin, TX 78735
Phone: (512) 301-9559
Fax: (512) 301-9552

Metals (Total) - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch
Manganese - EPA 200.8 R5.4													*Bryan*
Blank	<0.515	ug/L		0.111	0.515	06/26/20 05:35 AOG							M115116
LCS	10.0	ug/L		0.111	0.515	06/26/20 05:45 AOG	10.0		100	84.5 - 115.4			M115116
LCS Dup	9.21	ug/L		0.111	0.515	06/26/20 05:55 AOG	10.0		92.1	84.5 - 115.4	8.58	20	M115116
Duplicate	3.09	ug/L		0.111	0.515	06/26/20 06:05 AOG		3.04			1.62	20	M115116
Matrix Spike	10.1	ug/L		0.111	0.515	06/26/20 06:15 AOG	10.0	3.04	70.6	69.5 - 130.4			M115116
Blank	<0.500	ug/L		0.135	0.500	07/09/20 14:53 AOG							M115202
LCS	4.90	ug/L		0.135	0.500	07/09/20 15:03 AOG	5.00		98.0	84.5 - 115.4			M115202
LCS Dup	4.71	ug/L		0.135	0.500	07/09/20 15:13 AOG	5.00		94.2	84.5 - 115.4	3.88	20	M115202
Duplicate	<0.500	ug/L		0.135	0.500	07/09/20 15:23 AOG		<0.500				20	M115202
Matrix Spike	4.45	ug/L		0.135	0.500	07/09/20 15:33 AOG	5.00	<0.500	88.9	69.5 - 130.4			M115202

Preparation Procedures - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch
Turbidity - SM2130 B 2011													*Bryan*
Initial Cal Check	4.3	NTU				05/26/20 20:44 MRH	4.65		93.1	90 - 110			2005292

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Analytical Report

Apex Drilling

Report Printed: **7/13/20** **8:09**

D020305

Sample Preparation Summary

Sample	Method	Prepared	Lab	Bottle	Initial	Units	Final	Units	External Dilution Factor	Batch
D020305-01										
Fluoride	SM4500-F C 2011	6/23/20 18:33 MRH	Bryan	D	25.0	mL	25.0	mL	1	M115015
Iron	EPA 200.7 R4.4	6/24/20 14:58 BLC	Bryan	E	10.0	mL	10.2	mL	1	M115074
Manganese	EPA 200.8 R5.4	6/25/20 9:43 AOG	Bryan	E	10.0	mL	10.3	mL	1	M115116
Nitrate/Nitrite as N	SM4500-NO3-F 2011	6/25/20 10:00 MRB	Bryan	B	10.0	mL	10.0	mL	1	M115113
Nitrite as N	SM4500 NO2- B 2011	6/24/20 10:25 JLL	Austin	A	25.0	mL	25.0	mL	1	M115043
pH, Lab	SM4500-H+ B 2011	6/24/20 13:30 MSA	Austin	A	50.0	mL	50.0	mL	1	M115059
Sample Acidified to pH<2 in Lab	N/A	6/23/20 15:45 KK	Bryan	E	100	mL	100	mL	1	M114992
Specific Conductance (adjusted to 25.0°C)	SM2510 B 2011	6/29/20 11:35 CJO	Bryan	D	25.0	mL	25.0	mL	1	M115245
Temperature @ pH Analysis	SM4500-H+ B 2011	6/24/20 13:30 MSA	Austin	A	50.0	mL	50.0	mL	1	M115059
Total Dissolved Solids	SM2540 C 2011	6/26/20 12:05 MRH	Bryan	D	25.0	mL	100	mL	1	M115175
Total Hardness (EDTA) as CaCO3	SM2340 C 2011	6/26/20 6:30 MRH	Bryan	E	5.00	mL	50.0	mL	1	M115149
Turbidity	SM2130 B 2011	6/24/20 14:04 BLC	Bryan	E	10.0	mL	10.0	mL	1	M115062
D020305-01RE1										
Sample Acidified to pH<2 in Lab	N/A	6/23/20 15:45 KK	Bryan	B	100	mL	100	mL	1	M114993
D020305-02										
Fluoride	SM4500-F C 2011	6/23/20 18:33 MRH	Bryan	D	25.0	mL	25.0	mL	1	M115015
Iron	EPA 200.7 R4.4	6/24/20 14:44 BLC	Bryan	E	50.0	mL	25.0	mL	1	M115067
Manganese	EPA 200.8 R5.4	6/26/20 14:29 AOG	Bryan	E	50.0	mL	25.0	mL	2.5	M115202
Nitrate/Nitrite as N	SM4500-NO3-F 2011	6/25/20 10:00 MRB	Bryan	B	10.0	mL	10.0	mL	1	M115113
Nitrite as N	SM4500 NO2- B 2011	6/24/20 10:25 JLL	Austin	A	25.0	mL	25.0	mL	1	M115043
pH, Lab	SM4500-H+ B 2011	6/24/20 13:30 MSA	Austin	A	50.0	mL	50.0	mL	1	M115059
Sample Acidified to pH<2 in Lab	N/A	6/23/20 15:45 KK	Bryan	E	100	mL	100	mL	1	M114992
Specific Conductance (adjusted to 25.0°C)	SM2510 B 2011	6/29/20 11:35 CJO	Bryan	D	20.0	mL	50.0	mL	1	M115245
Temperature @ pH Analysis	SM4500-H+ B 2011	6/24/20 13:30 MSA	Austin	A	50.0	mL	50.0	mL	1	M115059
Total Dissolved Solids	SM2540 C 2011	6/26/20 12:05 MRH	Bryan	D	25.0	mL	100	mL	1	M115175
Turbidity	SM2130 B 2011	6/24/20 14:04 BLC	Bryan	E	10.0	mL	10.0	mL	1	M115062
D020305-02RE1										
Sample Acidified to pH<2 in Lab	N/A	6/23/20 15:45 KK	Bryan	B	100	mL	100	mL	1	M114993
Total Hardness (EDTA) as CaCO3	SM2340 C 2011	6/30/20 15:25 BLC	Bryan	E	10.0	mL	50.0	mL	1	M115318

Chain-of-Custody and Analysis Request

AQUA-TECH LABORATORIES, INC.

Client /Project:

Contact Info

Name: Apex Drilling
Address: 100 Spanish Oak Trail
City: Spicewood State: TX Zip: 78669
Phone / Email: 830-693-6770

Definitions

DW - Drinking Water
NP - Non-Potable Water
S - Solid
CM - Custody Maintained
CTU - Custody Transfer Unbroken
CT - Corrected Temperature
SUB - Subcontracted Analysis
(+) Container Type: P - Plastic, G - Glass, T - Teflon©

T104704371
TX239

Aqua-Tech Laboratories, Inc.

Austin: 7500 Hwy 71 W Suite 105, Austin, TX 78735, 512.301.9559
Bryan: 635 Phil Gramm Blvd., Bryan, TX 77807, 979.778.3707

Test results meet all accreditation/certification requirements unless stated otherwise.

Work Order / C-O-C: D020305-7
Page 1 of 1
V-0023 R03

By relinquishing the samples listed below to Aqua-Tech, the client agrees to the following terms.
Samples will be analyzed by a method that is within Aqua-Tech Laboratories' NELAC fields of accreditation. Analytes requiring a certified method that is not within Aqua-Tech's fields of accreditation will be subcontracted to a NELAC certified lab that is certified for that method. Clients will be notified of the subcontract lab's details. Other analytes not requiring accreditation will be analyzed by a compendial method. If a specific method is required, the client will note the method in the "Analysis Requested" column. The client approves all method modifications documented by Aqua-Tech or the subcontract lab. A current list of Aqua-Tech's NELAC fields of accreditation and other methods are available on request.

Sample Custody

Relinquished by (print & sign)	☐ Sampler ☐ Client ☐ ATL Field	Date 6.23.20 Time 15:20	☐ Iced / Refrig ☐ Custody Sealed
Received by (print & sign)	☐ Client ☐ ATL Field	Date	☐ Iced / Refrig ☐ CM / CTU
Relinquished by (print & sign) NELAC	☑ Client ☐ ATL Field	Date	☐ Iced / Refrig ☐ CM / CTU
Received by (print & sign)	☐ Client ☐ ATL Field	Date	☐ Iced / Refrig ☐ CM / CTU
Relinquished by (print & sign)	☐ Client ☐ ATL Field	Date	☐ Iced / Refrig ☐ CM / CTU / sealed
Received by (print & sign) christie Tonnu CTT	☑ Lab	Date 6/23/20 Time 1520	☑ Cond Good ☑ Iced / Refrig ☑ CM / CTU

Client Comments:

*** Preservatives**

1 < 6 °C (unfrozen)
2 H2SO4
3 HCl
4 HNO3
5 Na2S2O3
6 NaOH
7

Receipt in Lab

Cooler ID: clt
Temperature (°C): read / CT: 9.6/9.6 NELAC
Preservation Correct ? YES NO YES NO
Post Preservatives ? YES NO YES NO
Thermometer ID: 0715570
pH Paper ID: 0744948

Lab Comments: A wrong info <CTT>

Field Sample ID (record field data for each sample in space below)	Start Date	Start Time	End Date	End Time	Composite Type	Sample Matrix	Container(s) Bottle Count	Volume (Size in L)	Type (+)	Preserv-ative(s) *	LAB USE ONLY BELOW (initials CTT) Cooler ID	pH Check	SUB	WORK ORDER NA
RED OAK #5	6-23-20	10:40			Grab	DW	1	0.12 L	StP	1, 5	clt	–	–	Sample D020306-01A
Analysis Requested & Comments: Cl, conductivity, F, NO3, Total Coliform P/A, metals: Fe, Mn, pH, TDS, sulfate, total hardness							1	2L	P	1		–	Aqua Lab	NA D020305-01A
														MFE(S)
RED OAK #8	6-23-20	12:00					1	0.12L	P	4,5	clt	–	–	Sample D020307-01A
Analysis Requested & Comments: See sample analysis list Above. <SW>							1	2L	P	1		–	Aqua Lab	NA D020305-02A
														MFE(S)
														Sample
Analysis Requested & Comments:														
														Sample
Analysis Requested & Comments:										MFE(S)				
														Sample
Analysis Requested & Comments:														

Ana-Lab Corp.
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ANA LAB
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Project
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AQU5-C

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Printed 07/01/2020 16:20

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NELAP-accredited #T104704201-20-17

Ana-Lab Corp.
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AQU5-C

Aqua-Tech Laboratories (Austin
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Project
925842

Printed: 07/01/2020

Results

Sample Results

1898914 **D020305-01** Received: 06/24/2020

Drinking Water | Collected by: Client | Aqua-Tech Laboratori | PO:
Taken: 06/23/2020 10:00:00

EPA 300.0 2.1 Prepared: 904139 06/26/2020 21:11:00 Analyzed 904139 06/26/2020 21:11:00 ATN

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	**Chloride**	**198**	**mg/L**	30.0			01
NELAC	**Sulfate**	**1830**	**mg/L**	30.0	PD		01

1898915 **D020305-02** Received: 06/24/2020

Drinking Water | Collected by: Client | Aqua-Tech Laboratori | PO:
Taken: 06/23/2020 12:00:00

EPA 300.0 2.1 Prepared: 903766 06/24/2020 17:57:00 Analyzed 903766 06/24/2020 17:57:00 ATN

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	**Chloride**	**85.3**	**mg/L**	3.00			01

EPA 300.0 2.1 Prepared: 904159 06/27/2020 16:04:00 Analyzed 904159 06/27/2020 16:04:00 ATN

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	**Sulfate**	**1350**	**mg/L**	30.0	P		01

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Qualifiers:

D - Duplicate RPD was higher than expected

P - Spike recovery outside control limits due to matrix effects.

We report results on an As Received or wet basis unless marked Dry Weight. Unless otherwise noted, testing was performed at Ana-labs corporate laboratory that holds the following Federal and State certificates: EPA Lab Number TX00063, US Department of Agriculture Soil Import Permit P330-17-00117, Texas Commission on Environmental Quality Commercial Drinking Water Lab Approval (Lab ID: TX219), Texas Commission on Environmental Quality NELAP T104704201-20-17, Louisiana Department of Environmental Quality Laboratory Certification (NELAP, LELAP) #02008, Louisiana Department of Health and Hospitals Drinking Water (NELAP) Certificate No LA026, Oklahoma Department of Environmental Quality TNI Laboratory Accreditation Program Certificate No. 2018-126, Arkansas Department of Environmental Quality Certification #18-068-0. The Accredited column designates accreditation by N -- NELAC, or z -- not covered under NELAC scope of accreditation.
These analytical results relate to the sample tested. This report may NOT be reproduced EXCEPT in FULL without written approval of Ana-Lab Corp. Unless otherwise specified, these test results meet the requirements of NELAC.
RL is the Reporting Limit (sample specific quantitation limit) and is at or above the Method Detection Limit (MDL). CAS is Chemical Abstract Service number. RL is our Reporting Limit, or Minimum Quantitation Level. The RL takes into account the Instrument Detection Limit (IDL), Method Detection Limit (MDL), and Practical Quantitation Limit (PQL), and any dilutions and/or concentrations performed during sample preparation (EQL). Our analytical result must be above this RL before we report a value in the 'Results' column of our report (without a 'J' flag). Otherwise, we report ND (Not Detected above RL), because the result is "<" (less than) the number in the RL column. MAL is Minimum Analytical Level and is typically from regulatory agencies. Unless we report a result in the result column, or interferences prevent it, we work to have our RL at or below the MAL.

Trey Peery, MA, Project Manager

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CAS	Parameter	Results	MDL	SDL	MQL	MQLAdj	Flag	Units	Target	Bottle	Dilute
Drinking Water	**Ion Chromatography**										**EPA 300.0 2.1**
1898914	**D020305-01**										
	Collection: 06/23/2020 10:00:00 Client								*Received:* 06/24/2020		
	Prepared: ***904139***										
				Analyzed:		***904139***		6/26/20	21:11:00		
	Chloride	**198**	0.0053	0.530	0.300	30.0		**mg/L**	250 Secondary Standard	01	100.00
	Sulfate	**1830**	0.00775	0.775	0.300	30.0	PD	**mg/L**	250 Secondary Standard	01	100.00
1898915	**D020305-02**										
	Collection: 06/23/2020 12:00:00 Client								*Received:* 06/24/2020		
	Prepared: ***903766***										
				Analyzed:		***903766***		6/24/20	17:57:00		
	Chloride	**85.3**	0.0196	0.196	0.300	3.00		**mg/L**	250 Secondary Standard	01	10.00
	Prepared: ***904159***										
				Analyzed:		***904159***		6/27/20	16:04:00		
	Sulfate	**1350**	0.0109	1.09	0.300	30.0	P	**mg/L**	250 Secondary Standard	01	100.00

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CAS	Parameter	Results	MDL	SDL	MQL	MQLAdj	Flag	Units	Target	Bottle	Dilute
Drinking Water	**Ion Chromatography**									**EPA 300.0 2.1**	

MDL is Method Detection Limit (40 CFR 136 Appendix B)

SDL is Sample Detection Limit and is the adjusted MDL (sample specific dilutions, dry weight)

MQL is the Method Quantitation Limit and corresponds to a low standard

MQLADJ is the Adjusted Method Quantitation Limit (dilutions, dry weight)

Qualifiers:

D - Duplicate RPD was higher than expected

P - Spike recovery outside control limits due to matrix effects.

We report results on an As Received or wet basis unless marked Dry Weight. Unless otherwise noted, testing was performed at Ana-labs corporate laboratory that holds the following Federal and State certificates: EPA Lab Number TX00063, US Department of Agriculture Soil Import Permit P330-17-00117, Texas Commission on Environmental Quality Commercial Drinking Water Lab Approval (Lab ID: TX219), Texas Commission on Environmental Quality NELAP T104704201-20-17, Louisiana Department of Environmental Quality Laboratory Certification (NELAP, LELAP) #02008, Louisiana Department of Health and Hospitals Drinking Water (NELAP) Certificate No LA026, Oklahoma Department of Environmental Quality TNI Laboratory Accreditation Program Certificate No. 2018-126, Arkansas Department of Environmental Quality Certification #18-068-0. The Accredited column designates accreditation by N -- NELAC, or z -- not covered under NELAC scope of accreditation.
These analytical results relate to the sample tested. This report may NOT be reproduced EXCEPT in FULL without written approval of Ana-Lab Corp. Unless otherwise specified, these test results meet the requirements of NELAC.

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Quality Control

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Analytical Set 903766 — EPA 300.0 2.1

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Chloride	903766	0.090	0.0196	0.300	mg/L	121323220

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Chloride	10.0	10.0	mg/L	100	90.0 - 110	121323191
Chloride	10.0	10.0	mg/L	100	90.0 - 110	121323213
Chloride	10.1	10.0	mg/L	101	90.0 - 110	121323214
Chloride	10.1	10.0	mg/L	101	90.0 - 110	121323219
Chloride	10.1	10.0	mg/L	101	90.0 - 110	121323221

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Chloride	903766	4.87	4.94	5.00	85.0 - 110	97.4	98.8	mg/L	1.43	20.0

MSD

Parameter	Sample	MS	MSD	UNK	Known	Limits	MS%	MSD%	Units	RPD	Limit%
Chloride	1898522	325	352	229	100	80.0 - 120	96.0	123 *	mg/L	24.7 *	20.0
Chloride	1898879	14.9	14.7	7.05	10.0	80.0 - 120	78.5 *	76.5 *	mg/L	2.58	20.0

Analytical Set 904139 — EPA 300.0 2.1

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Chloride	904139	0.094	0.0053	0.300	mg/L	121332435
Sulfate	904139	0.048	0.00775	0.300	mg/L	121332435

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Chloride	10.1	10.0	mg/L	101	90.0 - 110	121332432
Chloride	10.3	10.0	mg/L	103	90.0 - 110	121332448
Sulfate	9.41	10.0	mg/L	94.1	90.0 - 110	121332432
Sulfate	9.52	10.0	mg/L	95.2	90.0 - 110	121332448

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Chloride	904139	5.14	5.17	5.00	85.0 - 110	103	103	mg/L	0.582	20.0
Sulfate	904139	4.83	4.84	5.00	88.0 - 110	96.6	96.8	mg/L	0.207	20.0

MSD

Parameter	Sample	MS	MSD	UNK	Known	Limits	MS%	MSD%	Units	RPD	Limit%
Chloride	1898914	284	284	198	100	80.0 - 120	86.0	86.0	mg/L	0	20.0
Sulfate	1898914	1890	1920	1830	100	80.0 - 120	60.0 *	90.0	mg/L	40.0 *	20.0

Analytical Set 904159 — EPA 300.0 2.1

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Quality Control

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Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Sulfate	904159	0.012	0.0109	0.300	mg/L	121332864

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Sulfate	9.99	10.0	mg/L	99.9	90.0 - 110	121332860
Sulfate	9.96	10.0	mg/L	99.6	90.0 - 110	121332876

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Sulfate	904159	5.00	5.00	5.00	88.0 - 110	100	100	mg/L	0	20.0

MSD

Parameter	Sample	MS	MSD	UNK	Known	Limits	MS%	MSD%	Units	RPD	Limit%
Sulfate	1898915	1480	1480	1350	100	80.0 - 120	130 *	130 *	mg/L	0	20.0

* Out RPD is Relative Percent Difference: abs(r1-r2) / mean(r1,r2) * 100% Recover% is Recovery Percent: result / known * 100%

Blank - Method Blank; CCV - Continuing Calibration Verification

NELAP-accredited #T104704201-20-17

AQUA-TECH LABORATORIES, INC.

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Bryan, TX 77807
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ATL - Austin Facility:
7500 Hwy 71 W, Suite 105
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Chain-of-Custody & Analysis Request

SHIPPED TO:
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C-O-C #

648 - D020305

T104704371

All analyses must be performed by a TNI approved method certified by the TCEQ. Contact ATL's sample custodian via voice and email if your methods do not meet this criteria.

Analysis Request for:	**Sample ID: D020305-01**	Sampled: 06/23/20 10:00	Matrix: Drinking Water	**Laboratory ID >>** 1898914
Chloride - EPA 300.0	SO4 DW - EPA 300.0			
Analysis Request for:	**Sample ID: D020305-02**	Sampled: 06/23/20 12:00	Matrix: Drinking Water	**Laboratory ID >>** 915
Chloride - EPA 300.0	SO4 DW - EPA 300.0			

CONTAINERS SUPPLIED: (ATL indicates cooler number in parentheses for each container - only required if more than one cooler listed below.)

( ) D020305-01 [C] - Cl SO4 0.25LP
( ) D020305-02 [C] - Cl SO4 0.25LP

Relinquished by: (print & sign) [X] ATL-Austin [ ] ATL - Bryan [ ] Sampler			Date	Time	Iced / Custody Sealed / Not Chilled
Kelly Kukowski			6/23/20	15:53	
Carrier & Tracking Number:	Cooler 1: AQU5 - 25844236				Sample Info "X" all that apply
Lone Star					
Received by: (print & sign) [ ] Received in Lab			Date	Time	Received Iced / CTU / Condition Good / Not Rec'd Iced
RayShawn Thompson			6/24/20	0910	

Line below documents condition at receipt in lab (shipped to) listed above.

Cooler Temperature (°C)	Temp. Read (TR)	Corrected Temp. (CT)	Thermometer ID
Cooler 1			
N/A	N/A	N/A	

Please email reports to: reporting@aqua-techlabs.com

Please return cooler(s) to: Austin Facility

Abbreviations: DW - Drinking Water; NP - Non-Potable Water; S - Solid; CTU - Custody Transfer Unbroken; StP - Sterile Plastic; LP - Liter Plastic; LG - Liter Glass

Aqua-Tech Comments and Special Instructions

5 DAY TAT

See Attached for Tracking # and Temp

BRET

925842 CoC Print Group 001 of 001

LSO
It's all in the delivery.

Airbill No. Z5844236

LSO
1-800-800-8984
www.lso.com

SHIP TO:
RECEIVING
ANA LAB CORP
2600 DUDLEY RD
KILGORE, TX 75662
9039840551

From:
KELLY KUKOWSKI
AQUA TECH LABS
7500 HWY 71 W STE 105
AUSTIN, TX 78735
5123019559

GGGG **LSO ECONOMY NEXT DAY**
3:00 IN MOST AREAS
LATER IN REMOTE AREAS

PRINT DATE: 6/23/2020 REF 3:
QUICKCODE: WEIGHT: 25.00LBS
REF 1: 1D00V.0000 REF 2:

6/24 0910 RT
Date Time Tech
Temp: 1.3/1.3 C
Therm#: 6205 Corr Fact: 0.0 C

Fold on above line and place shipping label in pouch on package. Please be sure the barcodes and addresses can be read and scanned. Shipping Instructions

1. Fold this page along the horizontal line above.
2. Place this Airbill in the shipping label pouch on the package you are shipping. Please be sure the barcodes and addresses can be read and scanned.
3. To locate a drop box near you, click on **Find A Drop Box** from the home page main menu.
4. To schedule a pickup, click on **Request Pickup**.

WARNING: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your Lone Star Overnight account number.

This label is valid for use for 3 months from the date printed. Use of expired labels may result in delayed billing and / or additional research charges. LIMIT OF LIABILITY: We are not responsible for claims in excess of $100 for any reason unless you: 1) declare a greater value (not to exceed $25,000); 2) pay an additional fee; 3) and document your actual loss in a timely manner. We will not pay any claim in excess of the actual loss. We are not liable for any special or consequential damages. Additional limitations of liability are contained in our current Service Guide. If you ask us to deliver a package without obtaining a delivery signature, you release us of all liability for claims resulting from such service. NO DELIVERY SIGNATURE WILL BE OBTAINED FOR 8:30 AM DELIVERIES OR RESIDENTIAL DELIVERIES.

Email information for report date:

7/2/20 10:28

D020307

Apex Drilling

Attn: Michael Becker

apexdrilling.becker@yahoo.com

PO Box 867

Marble Falls, TX 78654

COVID-19 UPDATE:

Aqua-Tech understands the concerns our clients have about the impact of COVID-19. Although we cannot predict what government or supply chain restrictions might develop, we have no plans to cease or limit our field and lab services.

We are following CDC recommendations and taking precautions to keep our clients and employees safe. This includes additional sanitation procedures and implementation of enhanced procedures for sample receiving. ATL is asking clients to help by placing samples in designated areas and using provided sanitizer. We also request any client that may be ill or may have been exposed to COVID-19 to contact us before entering our facilities. We will work out an individualized receipt protocol in these cases.

Thank you for your business,
June M. Brien
Executive Technical Director

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AQUA-TECH LABORATORIES, INC.

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Austin, TX 78735
Phone: (512) 301-9559
Fax: (512) 301-9552

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INF	Aqua-Tech Laboratories, Inc. is not accredited for this parameter. It is reported on an informational basis only.

Subcontracted data summarized in this report is indicated by "Sub" in the Lab column.

TCEQ DW Lab ID TX 239

General Definitions:

NR	Not Reported.
RPD	Relative Percent Difference.
% R	Percent Recovery.
dry	Results with the "dry" unit designation are reported on a "dry weight" basis.
SQL	The Sample Quantitation Limit is the value below which the parameter cannot reliably be detected. The SQL includes all sample preparations, dilutions and / or concentrations.
Adj MDL	The Adjusted Method Detection Limit is the MDL value adjusted for any sample dilutions or concentrations .
MDL	The Method Detection Limit is the lowest theoretical value that is statistically different from zero for a specific method, taking into account all preparation steps and instrument settings.

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Samples included in this report were received in acceptable condition according to Aqua-Tech Laboratories, Inc. procedures and 40 CFR, Chapter I, Subchapter D, Part 136.3, TABLE II. - *Required containers, preservation techniques, and holding times*, unless otherwise noted in this report.

Record Retention:

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This report was approved by:

June M. Brien, Technical Director

corp@aqua-techlabs.com www.aqua-techlabs.com

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Analytical Report

Apex Drilling

Report Printed: **7/2/20** **10:28**

D020307

RED OAK NO5

Collected: 06/23/20 10:00 by CLIENT
Received: 06/23/20 15:24 by Suzanne Rudd

Type: Grab
Matrix: Drinking Water
C-O-C #: D020305-7

Lab ID# D020307-01

	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
Microbiological Analyses											
Total Coliforms	**Absent**	N/A		N/A	**N/A**	N/A	*Austin*	06/23/20 17:05 JLL	SM9223 B 2004	M115001	NEL
Escherichia coli (E.coli)	**Absent**	N/A		N/A	**N/A**	N/A	*Austin*	06/23/20 17:05 JLL	SM9223 B 2004	M115001	NEL

Microbiological Analyses - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	Log10 Comparison Range	Log10 Comparison Control Limit	Batch	
Escherichia coli (E.coli) - SM9223 B 2004														*Austin*
Blank	Absent	N/A		N/A	N/A	06/23/20 17:05 JLL							M115001	
Total Coliforms - SM9223 B 2004														*Austin*
Blank	Absent	N/A		N/A	N/A	06/23/20 17:05 JLL							M115001	

Sample Preparation Summary

Sample	Method	Prepared	Lab	Bottle	Initial	Units	Final	Units	External Dilution Factor	Batch
D020307-01										
Escherichia coli (E.coli)	SM9223 B 2004	6/23/20 17:00 JLL	Austin	A	100	mL	100	mL	1	M115001
Total Coliforms	SM9223 B 2004	6/23/20 17:00 JLL	Austin	A	100	mL	100	mL	1	M115001

Chain-of-Custody and Analysis Request

AQUA-TECH LABORATORIES, INC.

Client /Project:

Contact Info

Name: Apex Drilling
Address: 100 Spanish Oak Trail
City: Spicewood State: TX Zip: 78669
Phone / Email: 830-693-6770

Definitions

DW - Drinking Water
NP - Non-Potable Water
S - Solid
CM - Custody Maintained
CTU - Custody Transfer Unbroken
CT - Corrected Temperature
SUB - Subcontracted Analysis
(+) Container Type: P - Plastic; G - Glass; T - Teflon©

T104704371
TX239

Aqua-Tech Laboratories, Inc.

Austin: 7500 Hwy 71 W Suite 105, Austin, TX 78735, 512.301.9559
Bryan: 635 Phil Gramm Blvd., Bryan, TX 77807, 979.778.3707

Test results meet all accreditation/certification requirements unless stated otherwise.

Work Order / C-O-C: D020305-7
Page 1 of 1
V-0023 R03

By relinquishing the samples listed below to Aqua-Tech, the client agrees to the following terms.
Samples will be analyzed by a method that is within Aqua-Tech Laboratories' NELAC fields of accreditation. Analytes requiring a certified method that is not within Aqua-Tech's fields of accreditation will be subcontracted to a NELAC certified lab that is certified for that method. Clients will be notified of the subcontract lab's details. Other analytes not requiring accreditation will be analyzed by a compendial method. If a specific method is required, the client will note the method in the "Analysis Requested" column. The client approves all method modifications documented by Aqua-Tech or the subcontract lab. A current list of Aqua-Tech's NELAC fields of accreditation and other methods are available on request.

Sample Custody

Relinquished by (print & sign)	☐ Sampler ☐ Client ☐ ATL Field	Date 6.23.20 Time 15:20	☐ Iced / Refrig ☐ Custody Sealed
Received by (print & sign)	☐ Client ☐ ATL Field	Date	☐ Iced / Refrig ☐ CM / CTU
Relinquished by (print & sign) NELAC	☑ Client ☐ ATL Field	Date	☐ Iced / Refrig ☐ CM / CTU
Received by (print & sign)	☐ Client ☐ ATL Field	Date	☐ Iced / Refrig ☐ CM / CTU
Relinquished by (print & sign)	☐ Client ☐ ATL Field	Date	☐ Iced / Refrig ☐ CM / CTU / sealed
Received by (print & sign) christie Tonnu CTT	☑ Lab	Date 6/23/20 Time 1520	☑ Cond Good ☑ Iced / Refrig ☑ CM / CTU

Client Comments:

*** Preservatives**

1 < 6 °C (unfrozen)
2 H2SO4
3 HCl
4 HNO3
5 Na2S2O3
6 NaOH
7

Receipt in Lab

Cooler ID: clt
Temperature (°C): read / CT: 9.6/9.6 NELAC
Preservation Correct ? YES NO YES NO
Post Preservatives ? YES NO YES NO
Thermometer ID: 0715570
pH Paper ID: 0744948

Lab Comments: A wrong info <CTT>

Field Sample ID (record field data for each sample in space below)	Start Date	Start Time	End Date	End Time	Composite Type	Sample Matrix	Container(s) Bottle Count	Volume (Size in L)	Type (+)	Preserv-ative(s) *	LAB USE ONLY BELOW (initials CTT) Cooler ID	pH Check	SUB	WORK ORDER NA	Sample
RED OAK # 5	6-23-20	10:40			Grab	DW	1	0.12 L	StP	1, 5	CTT	–	–		D020306-01A
Analysis Requested & Comments: Cl, conductivity, F, NO3, Total Coliform P/A, metals: Fe, Mn, pH, TDS, sulfate, total hardness							1	2L	P	1		–	Aqua Lab	NA	D020305-01A
															NELAC
RED OAK # 8	6-23-20	12:00					1	0.12L	P	4,5	CTT	–	–		Sample D020307-01A
Analysis Requested & Comments: See sample analysis list Above. <SUB>							1	2L	P	1		–	Aqua Lab	NA	D020305-02A
															NELAC
															Sample
Analysis Requested & Comments:															
															Sample
Analysis Requested & Comments:															NELAC
															Sample
Analysis Requested & Comments:															

Water Quality

Well No. 8

Email information for report date:
7/13/20 08:09

D020305

Apex Drilling

Attn: Michael Becker
apexdrilling.becker@yahoo.com

PO Box 867
Marble Falls, TX 78654

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corp@aqua-techlabs.com www.aqua-techlabs.com

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Analytical Report

Apex Drilling

Report Printed: **7/13/20** **8:09**

D020305

Apex Drilling RED OAK WELL 5

Collected: 06/23/20 10:00 by CLIENT
Received: 06/23/20 15:20 by Christie Tonnu

Type: Grab | *Matrix*: Drinking Water | *C-O-C #*: D020305-7

Lab ID# D020305-01	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
General Chemistry											
Total Dissolved Solids	**3480**	mg/L		25.0	100	100	*Bryan*	06/26/20 12:05 MRH	SM2540 C 2011	M115175	NEL
Nitrate as N (NO3N)	**<0.0200**	mg/L			0.0200	0.0200	*Austin*	06/25/20 11:24 JLL	SM4500-NO3-F 2011	[CALC]	NEL
Nitrite as N	**<0.01**	mg/L		0.002	0.002	0.01	*Austin*	06/24/20 10:25 JLL	SM4500 NO2- B 2011	M115043	NEL
Nitrate/Nitrite as N	**<0.02**	mg/L		0.02	0.02	0.02	*Bryan*	06/25/20 11:24 MRB	SM4500-NO3-F 2011	M115113	ANR
Total Hardness (EDTA) as CaCO3	**1700**	mg/L		1.00	10.0	10.0	*Bryan*	06/26/20 06:30 MRH	SM2340 C 2011	M115149	NEL
Fluoride	**2.47**	mg/L		0.04	0.04	0.10	*Bryan*	06/23/20 18:33 MRH	SM4500-F C 2011	M115015	NEL
pH, Lab	**7.7**	S.U.	Hold-03		N/A	N/A	*Austin*	06/24/20 13:30 MSA	SM4500-H+ B 2011	M115059	DWP
Temperature @ pH Analysis	**22.0**	Deg. C			N/A	N/A	*Austin*	06/24/20 13:30 MSA	SM4500-H+ B 2011	M115059	DWP
Specific Conductance (adjusted to 25.0°C)	**3.26**	uS/cm		2.00	2.00	2.00	*Bryan*	06/29/20 11:35 CJO	SM2510 B 2011	M115245	DWP,NEL
Metals (Total)											
Iron	**0.283**	mg/L		0.002	0.002	0.010	*Bryan*	06/29/20 16:59 PNS	EPA 200.7 R4.4	M115074	NEL
Manganese	**6.28**	ug/L		0.108	0.111	0.515	*Bryan*	06/26/20 06:35 AOG	EPA 200.8 R5.4	M115116	NEL

Apex Drilling RED OAK WELL 8

Collected: 06/23/20 12:00 by CLIENT
Received: 06/23/20 15:20 by Christie Tonnu

Type: Grab | *Matrix*: Drinking Water | *C-O-C #*: D020305-7

Lab ID# D020305-02	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
General Chemistry											
Total Dissolved Solids	**2600**	mg/L		25.0	100	100	*Bryan*	06/26/20 12:05 MRH	SM2540 C 2011	M115175	NEL
Nitrate as N (NO3N)	**<0.0200**	mg/L			0.0200	0.0200	*Austin*	06/25/20 11:24 JLL	SM4500-NO3-F 2011	[CALC]	NEL
Nitrite as N	**<0.01**	mg/L	J (0.004)	0.002	0.002	0.01	*Austin*	06/24/20 10:25 JLL	SM4500 NO2- B 2011	M115043	NEL
Nitrate/Nitrite as N	**<0.02**	mg/L		0.02	0.02	0.02	*Bryan*	06/25/20 11:24 MRB	SM4500-NO3-F 2011	M115113	ANR
Fluoride	**2.34**	mg/L		0.04	0.04	0.10	*Bryan*	06/23/20 18:33 MRH	SM4500-F C 2011	M115015	NEL
pH, Lab	**7.5**	S.U.	Hold-03		N/A	N/A	*Austin*	06/24/20 13:30 MSA	SM4500-H+ B 2011	M115059	DWP
Temperature @ pH Analysis	**21.5**	Deg. C			N/A	N/A	*Austin*	06/24/20 13:30 MSA	SM4500-H+ B 2011	M115059	DWP
Specific Conductance (adjusted to 25.0°C)	**3250**	uS/cm		2.00	5.00	5.00	*Bryan*	06/29/20 11:35 CJO	SM2510 B 2011	M115245	DWP,NEL
Metals (Total)											
Iron	**0.307**	mg/L		0.002	0.001	0.005	*Bryan*	07/02/20 21:18 PNS	EPA 200.7 R4.4	M115067	NEL
Manganese	**10.2**	ug/L		0.108	0.135	0.500	*Bryan*	07/09/20 15:43 AOG	EPA 200.8 R5.4	M115202	NEL

D020305-02 - re-analysis	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
General Chemistry											
Total Hardness (EDTA) as CaCO3	**1470**	mg/L		1.00	5.00	5.00	*Bryan*	07/06/20 18:33 MRH	SM2340 C 2011	M115318	NEL

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Explanation of Notes

Hold-03	This parameter was outside of EPA holding at the time the sample was received in the laboratory.
J	Analyte detected below the SQL but above the MDL.

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Analytical Report

Apex Drilling

Report Printed: **7/13/20** **8:09**

D020305

General Chemistry - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Fluoride - SM4500-F C 2011														*Bryan*
Initial Cal Check	0.47	mg/L				06/23/20 18:33 MRH	0.428		110	90 - 110			2006259	
Blank	<0.10	mg/L		0.04	0.10	06/23/20 18:33 MRH							M115015	
LCS	0.83	mg/L		0.04	0.10	06/23/20 18:33 MRH	0.798		104	90 - 110			M115015	
LCS Dup	0.81	mg/L		0.04	0.10	06/23/20 18:33 MRH	0.798		101	90 - 110	3.05	6.23	M115015	
Matrix Spike	3.43	mg/L		0.04	0.10	06/23/20 18:33 MRH	0.798	2.53	113	78.1 - 125			M115015	
Matrix Spike Dup	3.46	mg/L		0.04	0.10	06/23/20 18:33 MRH	0.798	2.53	116	78.1 - 125	3.28	5.72	M115015	
MRL Check	0.10	mg/L		0.04	0.10	06/23/20 18:33 MRH	0.0998		98.0	73.4 - 118			M115015	
Nitrate/Nitrite as N - SM4500-NO3-F 2011														*Bryan*
Initial Cal Check	1.78	mg/L				06/25/20 11:24 MRB	1.69		106	90 - 110			2006295	
Low Cal Check	0.02	mg/L				06/25/20 11:24 MRB	0.0200		100	70 - 130			2006295	
Blank	<0.02	mg/L		0.02	0.02	06/25/20 11:24 MRB							M115113	
LCS	0.50	mg/L		0.02	0.02	06/25/20 11:24 MRB	0.500		99.7	91.3 - 109			M115113	
LCS Dup	0.50	mg/L		0.02	0.02	06/25/20 11:24 MRB	0.500		101	91.3 - 109	0.940	6.8	M115113	
Matrix Spike	0.87	mg/L		0.02	0.02	06/25/20 11:24 MRB	0.500	0.35	104	94.7 - 117			M115113	
Matrix Spike Dup	0.88	mg/L		0.02	0.02	06/25/20 11:24 MRB	0.500	0.35	107	94.7 - 117	2.99	8.65	M115113	
Nitrite as N - SM4500 NO2- B 2011														*Austin*
Blank	<0.01	mg/L		0.002	0.01	06/24/20 10:25 JLL							M115043	
LCS	0.08	mg/L		0.002	0.01	06/24/20 10:25 JLL	0.0800		105	90 - 110			M115043	
LCS Dup	0.08	mg/L		0.002	0.01	06/24/20 10:25 JLL	0.0800		102	90 - 110	2.94	8.12	M115043	
Matrix Spike	0.08	mg/L		0.002	0.01	06/24/20 10:25 JLL	0.0800	<0.01	98.1	70.6 - 117			M115043	
Matrix Spike Dup	0.08	mg/L		0.002	0.01	06/24/20 10:25 JLL	0.0800	<0.01	97.6	70.6 - 117	0.444	8.18	M115043	
MRL Check	<0.01	mg/L	*J (0.009)*	0.002	0.01	06/24/20 10:25 JLL	0.0100		92.3	70 - 130			M115043	
pH, Lab - SM4500-H+ B 2011														*Austin*
Duplicate	7.8	Std Units				06/24/20 13:30 MSA		7.7			0.129	1.18	M115059	
Reference	7.0	Std Units				06/24/20 13:30 MSA	6.86		101	95 - 105			M115059	
Reference	9.2	Std Units				06/24/20 13:30 MSA	9.18		99.9	95 - 105			M115059	
Reference	7.0	Std Units				06/24/20 13:30 MSA	6.86		101	95 - 105			M115059	
Reference	9.2	Std Units				06/24/20 13:30 MSA	9.18		99.8	95 - 105			M115059	
Specific Conductance (adjusted to 25.0°C) - SM2510 B 2011														*Bryan*
Initial Cal Check	447	uS/cm				06/29/20 11:35 CJO	437		102	85 - 115			2006330	
Blank	<2.00	uS/cm		2.00	2.00	06/29/20 11:35 CJO							M115245	
Duplicate	3300	uS/cm		5.00	5.00	06/29/20 11:35 CJO		3360			1.95	2	M115245	
LCS	1460	uS/cm		2.00	2.00	06/29/20 11:35 CJO	1410		103	90 - 110			M115245	

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Analytical Report

Apex Drilling

Report Printed: **7/13/20** **8:09**

D020305

General Chemistry - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Total Dissolved Solids - SM2540 C 2011														*Bryan*
Blank	<25.0	mg/L		25.0	25.0	06/26/20 12:05 MRH							M115175	
Duplicate	280	mg/L		100	100	06/26/20 12:05 MRH		280			0.00	9.13	M115175	
Reference	528	mg/L		100	100	06/26/20 12:05 MRH	500		106	81 - 121			M115175	
Total Hardness (EDTA) as CaCO3 - SM2340 C 2011														*Bryan*
Initial Cal Check	56.0	mg/L				06/26/20 06:30 MRH	54.4		103	85 - 115			2006305	
Blank	<1.00	mg/L		1.00	1.00	06/26/20 06:30 MRH							M115149	
Duplicate	156	mg/L		1.00	1.00	06/26/20 06:30 MRH		156			0.00	9.52	M115149	
LCS	102	mg/L		1.00	1.00	06/26/20 06:30 MRH	100		102	90 - 110			M115149	
LCS Dup	96.0	mg/L		1.00	1.00	06/26/20 06:30 MRH	100		96.0	90 - 110	6.06	6.47	M115149	
Matrix Spike	260	mg/L		1.00	1.00	06/26/20 06:30 MRH	100	156	104	87.6 - 111			M115149	
MRL Check	4.00	mg/L		1.00	1.00	06/26/20 06:30 MRH	4.00		100	70 - 130			M115149	
Initial Cal Check	50.0	mg/L				07/06/20 18:33 MRH	54.4		91.9	85 - 115			2007056	
Blank	<1.00	mg/L		1.00	1.00	07/06/20 18:33 MRH							M115318	
Duplicate	<1.00	mg/L		1.00	1.00	07/06/20 18:33 MRH		<1.00				9.52	M115318	
LCS	79.2	mg/L		1.00	1.00	07/06/20 18:33 MRH	80.0		99.0	90 - 110			M115318	
LCS Dup	79.2	mg/L		1.00	1.00	07/06/20 18:33 MRH	80.0		99.0	90 - 110	0.00	6.47	M115318	
Matrix Spike	89.6	mg/L		1.00	1.00	07/06/20 18:33 MRH	80.0	<1.00	112	85 - 115			M115318	
MRL Check	4.17	mg/L		1.00	1.00	07/06/20 18:33 MRH	4.00		104	70 - 130			M115318	

Metals (Total) - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Iron - EPA 200.7 R4.4														*Bryan*
Blank	<0.010	mg/L		0.002	0.010	06/29/20 16:42 PNS							M115074	
LCS	1.08	mg/L		0.002	0.010	06/29/20 16:45 PNS	1.00		108	84.5 - 115.4			M115074	
LCS Dup	1.05	mg/L		0.002	0.010	06/29/20 16:49 PNS	1.00		105	84.5 - 115.4	3.50	20	M115074	
Duplicate	0.288	mg/L		0.002	0.010	06/29/20 16:52 PNS		0.283			1.76	20	M115074	
Matrix Spike	1.27	mg/L		0.002	0.010	06/29/20 16:56 PNS	1.00	0.283	99.0	69.5 - 130.4			M115074	
Blank	<0.005	mg/L		0.001	0.005	07/02/20 20:58 PNS							M115067	
LCS	0.473	mg/L		0.001	0.005	07/02/20 21:01 PNS	0.500		94.7	84.5 - 115.4			M115067	
LCS Dup	0.465	mg/L		0.001	0.005	07/02/20 21:04 PNS	0.500		93.1	84.5 - 115.4	1.69	20	M115067	
Duplicate	0.271	mg/L		0.001	0.005	07/02/20 21:07 PNS		0.307			12.5	20	M115067	
Matrix Spike	0.809	mg/L		0.001	0.005	07/02/20 21:11 PNS	0.500	0.307	101	69.5 - 130.4			M115067	

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Metals (Total) - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch
Manganese - EPA 200.8 R5.4													*Bryan*
Blank	<0.515	ug/L		0.111	0.515	06/26/20 05:35 AOG							M115116
LCS	10.0	ug/L		0.111	0.515	06/26/20 05:45 AOG	10.0		100	84.5 - 115.4			M115116
LCS Dup	9.21	ug/L		0.111	0.515	06/26/20 05:55 AOG	10.0		92.1	84.5 - 115.4	8.58	20	M115116
Duplicate	3.09	ug/L		0.111	0.515	06/26/20 06:05 AOG		3.04			1.62	20	M115116
Matrix Spike	10.1	ug/L		0.111	0.515	06/26/20 06:15 AOG	10.0	3.04	70.6	69.5 - 130.4			M115116
Blank	<0.500	ug/L		0.135	0.500	07/09/20 14:53 AOG							M115202
LCS	4.90	ug/L		0.135	0.500	07/09/20 15:03 AOG	5.00		98.0	84.5 - 115.4			M115202
LCS Dup	4.71	ug/L		0.135	0.500	07/09/20 15:13 AOG	5.00		94.2	84.5 - 115.4	3.88	20	M115202
Duplicate	<0.500	ug/L		0.135	0.500	07/09/20 15:23 AOG		<0.500				20	M115202
Matrix Spike	4.45	ug/L		0.135	0.500	07/09/20 15:33 AOG	5.00	<0.500	88.9	69.5 - 130.4			M115202

Preparation Procedures - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch
Turbidity - SM2130 B 2011													*Bryan*
Initial Cal Check	4.3	NTU				05/26/20 20:44 MRH	4.65		93.1	90 - 110			2005292

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Analytical Report

Apex Drilling

Report Printed: **7/13/20** **8:09**

D020305

Sample Preparation Summary

Sample	Method	Prepared	Lab	Bottle	Initial	Units	Final	Units	External Dilution Factor	Batch
D020305-01										
Fluoride	SM4500-F C 2011	6/23/20 18:33 MRH	Bryan	D	25.0	mL	25.0	mL	1	M115015
Iron	EPA 200.7 R4.4	6/24/20 14:58 BLC	Bryan	E	10.0	mL	10.2	mL	1	M115074
Manganese	EPA 200.8 R5.4	6/25/20 9:43 AOG	Bryan	E	10.0	mL	10.3	mL	1	M115116
Nitrate/Nitrite as N	SM4500-NO3-F 2011	6/25/20 10:00 MRB	Bryan	B	10.0	mL	10.0	mL	1	M115113
Nitrite as N	SM4500 NO2- B 2011	6/24/20 10:25 JLL	Austin	A	25.0	mL	25.0	mL	1	M115043
pH, Lab	SM4500-H+ B 2011	6/24/20 13:30 MSA	Austin	A	50.0	mL	50.0	mL	1	M115059
Sample Acidified to pH<2 in Lab	N/A	6/23/20 15:45 KK	Bryan	E	100	mL	100	mL	1	M114992
Specific Conductance (adjusted to 25.0°C)	SM2510 B 2011	6/29/20 11:35 CJO	Bryan	D	25.0	mL	25.0	mL	1	M115245
Temperature @ pH Analysis	SM4500-H+ B 2011	6/24/20 13:30 MSA	Austin	A	50.0	mL	50.0	mL	1	M115059
Total Dissolved Solids	SM2540 C 2011	6/26/20 12:05 MRH	Bryan	D	25.0	mL	100	mL	1	M115175
Total Hardness (EDTA) as CaCO3	SM2340 C 2011	6/26/20 6:30 MRH	Bryan	E	5.00	mL	50.0	mL	1	M115149
Turbidity	SM2130 B 2011	6/24/20 14:04 BLC	Bryan	E	10.0	mL	10.0	mL	1	M115062
D020305-01RE1										
Sample Acidified to pH<2 in Lab	N/A	6/23/20 15:45 KK	Bryan	B	100	mL	100	mL	1	M114993
D020305-02										
Fluoride	SM4500-F C 2011	6/23/20 18:33 MRH	Bryan	D	25.0	mL	25.0	mL	1	M115015
Iron	EPA 200.7 R4.4	6/24/20 14:44 BLC	Bryan	E	50.0	mL	25.0	mL	1	M115067
Manganese	EPA 200.8 R5.4	6/26/20 14:29 AOG	Bryan	E	50.0	mL	25.0	mL	2.5	M115202
Nitrate/Nitrite as N	SM4500-NO3-F 2011	6/25/20 10:00 MRB	Bryan	B	10.0	mL	10.0	mL	1	M115113
Nitrite as N	SM4500 NO2- B 2011	6/24/20 10:25 JLL	Austin	A	25.0	mL	25.0	mL	1	M115043
pH, Lab	SM4500-H+ B 2011	6/24/20 13:30 MSA	Austin	A	50.0	mL	50.0	mL	1	M115059
Sample Acidified to pH<2 in Lab	N/A	6/23/20 15:45 KK	Bryan	E	100	mL	100	mL	1	M114992
Specific Conductance (adjusted to 25.0°C)	SM2510 B 2011	6/29/20 11:35 CJO	Bryan	D	20.0	mL	50.0	mL	1	M115245
Temperature @ pH Analysis	SM4500-H+ B 2011	6/24/20 13:30 MSA	Austin	A	50.0	mL	50.0	mL	1	M115059
Total Dissolved Solids	SM2540 C 2011	6/26/20 12:05 MRH	Bryan	D	25.0	mL	100	mL	1	M115175
Turbidity	SM2130 B 2011	6/24/20 14:04 BLC	Bryan	E	10.0	mL	10.0	mL	1	M115062
D020305-02RE1										
Sample Acidified to pH<2 in Lab	N/A	6/23/20 15:45 KK	Bryan	B	100	mL	100	mL	1	M114993
Total Hardness (EDTA) as CaCO3	SM2340 C 2011	6/30/20 15:25 BLC	Bryan	E	10.0	mL	50.0	mL	1	M115318

Chain-of-Custody and Analysis Request

AQUA-TECH LABORATORIES, INC.

Client /Project:

Contact Info

Name: Apex Drilling
Address: 100 Spanish Oak Trail
City: Spicewood State: TX Zip: 78669
Phone / Email: 830-693-6770

Definitions

DW - Drinking Water
NP - Non-Potable Water
S - Solid
CM - Custody Maintained
CTU - Custody Transfer Unbroken
CT - Corrected Temperature
SUB - Subcontracted Analysis
(+) Container Type: P - Plastic, G - Glass, T - Teflon©

T104704371
TX239

Aqua-Tech Laboratories, Inc.

Austin: 7500 Hwy 71 W Suite 105, Austin, TX 78735, 512.301.9559
Bryan: 635 Phil Gramm Blvd., Bryan, TX 77807, 979.778.3707

Test results meet all accreditation/certification requirements unless stated otherwise.

Work Order / C-O-C: D020305-7
Page 1 of 1
V-0023 R03

By relinquishing the samples listed below to Aqua-Tech, the client agrees to the following terms.
Samples will be analyzed by a method that is within Aqua-Tech Laboratories' NELAC fields of accreditation. Analytes requiring a certified method that is not within Aqua-Tech's fields of accreditation will be subcontracted to a NELAC certified lab that is certified for that method. Clients will be notified of the subcontract lab's details. Other analytes not requiring accreditation will be analyzed by a compendial method. If a specific method is required, the client will note the method in the "Analysis Requested" column. The client approves all method modifications documented by Aqua-Tech or the subcontract lab. A current list of Aqua-Tech's NELAC fields of accreditation and other methods are available on request.

Sample Custody

Relinquished by (print & sign)	☐ Sampler ☐ Client ☐ ATL Field	Date 6.23.20 Time 15:20	☐ Iced / Refrig ☐ Custody Sealed
Received by (print & sign)	☐ Client ☐ ATL Field	Date	☐ Iced / Refrig ☐ CM / CTU
Relinquished by (print & sign) NELAC	☑ Client ☐ ATL Field	Date	☐ Iced / Refrig ☐ CM / CTU
Received by (print & sign)	☐ Client ☐ ATL Field	Date	☐ Iced / Refrig ☐ CM / CTU
Relinquished by (print & sign)	☐ Client ☐ ATL Field	Date	☐ Iced / Refrig ☐ CM / CTU / sealed
Received by (print & sign) christie Tonnu CTT	☑ Lab	Date 6/23/20 Time 1520	☑ Cond Good ☑ Iced / Refrig ☑ CM / CTU

Client Comments:

*** Preservatives**

1 < 6 °C (unfrozen)
2 H2SO4
3 HCl
4 HNO3
5 Na2S2O3
6 NaOH
7

Receipt in Lab

Cooler ID: clt
Temperature (°C): read / CT: 9.6/9.6 NELAC
Preservation Correct ? YES NO YES NO
Post Preservatives ? YES NO YES NO
Thermometer ID: 0715570
pH Paper ID: 0744948

Lab Comments: A wrong info <CTT>

Field Sample ID (record field data for each sample in space below)	Start Date	Start Time	End Date	End Time	Composite Type	Sample Matrix	Container(s) Bottle Count	Volume (Size in L)	Type (+)	Preserv-ative(s) *	LAB USE ONLY BELOW (initials CTT) Cooler ID	pH Check	SUB	WORK ORDER NA
RED OAK #5	6-23-20	10:40			Grab	DW	1	0.12 L	StP	1, 5	clt	–	–	Sample D020306-01A
Analysis Requested & Comments: Cl, conductivity, F, NO3, Total Coliform P/A, metals: Fe, Mn, pH, TDS, sulfate, total hardness							1	2L	P	1		–	Aqua Lab	NA D020305-01A
														MFE(S)
RED OAK #8	6-23-20	12:00					1	0.12L	P	4,5	clt	–	–	Sample D020307-01A
Analysis Requested & Comments: See sample analysis list Above. <SW>							1	2L	P	1		–	Aqua Lab	NA D020305-02A
														MFE(S)
														Sample
Analysis Requested & Comments:														
														Sample
Analysis Requested & Comments:										MFE(S)				
														Sample
Analysis Requested & Comments:														

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ANA LAB
Testing the Limits of Science and Service

Project
925842

AQU5-C

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Printed 07/01/2020 16:20

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NELAP-accredited #T104704201-20-17

Ana-Lab Corp.
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AQU5-C

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Project
925842

Printed: 07/01/2020

Results

Sample Results

1898914 **D020305-01** Received: 06/24/2020

Drinking Water | Collected by: Client | Aqua-Tech Laboratori | PO:
Taken: 06/23/2020 10:00:00

EPA 300.0 2.1 Prepared: 904139 06/26/2020 21:11:00 Analyzed 904139 06/26/2020 21:11:00 ATN

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	**Chloride**	**198**	**mg/L**	30.0			01
NELAC	**Sulfate**	**1830**	**mg/L**	30.0	PD		01

1898915 **D020305-02** Received: 06/24/2020

Drinking Water | Collected by: Client | Aqua-Tech Laboratori | PO:
Taken: 06/23/2020 12:00:00

EPA 300.0 2.1 Prepared: 903766 06/24/2020 17:57:00 Analyzed 903766 06/24/2020 17:57:00 ATN

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	**Chloride**	**85.3**	**mg/L**	3.00			01

EPA 300.0 2.1 Prepared: 904159 06/27/2020 16:04:00 Analyzed 904159 06/27/2020 16:04:00 ATN

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	**Sulfate**	**1350**	**mg/L**	30.0	P		01

NELAP-accredited #T104704201-20-17

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Project
925842

Printed: 07/01/2020

Qualifiers:

D - Duplicate RPD was higher than expected

P - Spike recovery outside control limits due to matrix effects.

We report results on an As Received or wet basis unless marked Dry Weight. Unless otherwise noted, testing was performed at Ana-labs corporate laboratory that holds the following Federal and State certificates: EPA Lab Number TX00063, US Department of Agriculture Soil Import Permit P330-17-00117, Texas Commission on Environmental Quality Commercial Drinking Water Lab Approval (Lab ID: TX219), Texas Commission on Environmental Quality NELAP T104704201-20-17, Louisiana Department of Environmental Quality Laboratory Certification (NELAP, LELAP) #02008, Louisiana Department of Health and Hospitals Drinking Water (NELAP) Certificate No LA026, Oklahoma Department of Environmental Quality TNI Laboratory Accreditation Program Certificate No. 2018-126, Arkansas Department of Environmental Quality Certification #18-068-0. The Accredited column designates accreditation by N -- NELAC, or z -- not covered under NELAC scope of accreditation.
These analytical results relate to the sample tested. This report may NOT be reproduced EXCEPT in FULL without written approval of Ana-Lab Corp. Unless otherwise specified, these test results meet the requirements of NELAC.
RL is the Reporting Limit (sample specific quantitation limit) and is at or above the Method Detection Limit (MDL). CAS is Chemical Abstract Service number. RL is our Reporting Limit, or Minimum Quantitation Level. The RL takes into account the Instrument Detection Limit (IDL), Method Detection Limit (MDL), and Practical Quantitation Limit (PQL), and any dilutions and/or concentrations performed during sample preparation (EQL). Our analytical result must be above this RL before we report a value in the 'Results' column of our report (without a 'J' flag). Otherwise, we report ND (Not Detected above RL), because the result is "<" (less than) the number in the RL column. MAL is Minimum Analytical Level and is typically from regulatory agencies. Unless we report a result in the result column, or interferences prevent it, we work to have our RL at or below the MAL.

Trey Peery, MA, Project Manager

NELAP-accredited #T104704201-20-17

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RESULTS

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Printed 07/01/2020

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John Brien
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Bryan, TX 77807-9104

CAS	Parameter	Results	MDL	SDL	MQL	MQLAdj	Flag	Units	Target	Bottle	Dilute
Drinking Water	**Ion Chromatography**										**EPA 300.0 2.1**
1898914	**D020305-01**										
	Collection: 06/23/2020 10:00:00 Client								*Received:* 06/24/2020		
	Prepared: ***904139***										
				Analyzed:		***904139***		6/26/20	21:11:00		
	Chloride	**198**	0.0053	0.530	0.300	30.0		**mg/L**	250 Secondary Standard	01	100.00
	Sulfate	**1830**	0.00775	0.775	0.300	30.0	PD	**mg/L**	250 Secondary Standard	01	100.00
1898915	**D020305-02**										
	Collection: 06/23/2020 12:00:00 Client								*Received:* 06/24/2020		
	Prepared: ***903766***										
				Analyzed:		***903766***		6/24/20	17:57:00		
	Chloride	**85.3**	0.0196	0.196	0.300	3.00		**mg/L**	250 Secondary Standard	01	10.00
	Prepared: ***904159***										
				Analyzed:		***904159***		6/27/20	16:04:00		
	Sulfate	**1350**	0.0109	1.09	0.300	30.0	P	**mg/L**	250 Secondary Standard	01	100.00

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RESULTS

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CAS	Parameter	Results	MDL	SDL	MQL	MQLAdj	Flag	Units	Target	Bottle	Dilute
Drinking Water	**Ion Chromatography**									**EPA 300.0 2.1**	

MDL is Method Detection Limit (40 CFR 136 Appendix B)

SDL is Sample Detection Limit and is the adjusted MDL (sample specific dilutions, dry weight)

MQL is the Method Quantitation Limit and corresponds to a low standard

MQLADJ is the Adjusted Method Quantitation Limit (dilutions, dry weight)

Qualifiers:

D - Duplicate RPD was higher than expected

P - Spike recovery outside control limits due to matrix effects.

We report results on an As Received or wet basis unless marked Dry Weight. Unless otherwise noted, testing was performed at Ana-labs corporate laboratory that holds the following Federal and State certificates: EPA Lab Number TX00063, US Department of Agriculture Soil Import Permit P330-17-00117, Texas Commission on Environmental Quality Commercial Drinking Water Lab Approval (Lab ID: TX219), Texas Commission on Environmental Quality NELAP T104704201-20-17, Louisiana Department of Environmental Quality Laboratory Certification (NELAP, LELAP) #02008, Louisiana Department of Health and Hospitals Drinking Water (NELAP) Certificate No LA026, Oklahoma Department of Environmental Quality TNI Laboratory Accreditation Program Certificate No. 2018-126, Arkansas Department of Environmental Quality Certification #18-068-0. The Accredited column designates accreditation by N -- NELAC, or z -- not covered under NELAC scope of accreditation.
These analytical results relate to the sample tested. This report may NOT be reproduced EXCEPT in FULL without written approval of Ana-Lab Corp. Unless otherwise specified, these test results meet the requirements of NELAC.

Trey Peery, MA, Project Manager

NELAP-accredited #T104704201-20-17

Quality Control

ANALAB
Testing the Limits of Science and Service

AQU5-C

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Project
925842

Printed 07/01/2020

Analytical Set 903766 — EPA 300.0 2.1

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Chloride	903766	0.090	0.0196	0.300	mg/L	121323220

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Chloride	10.0	10.0	mg/L	100	90.0 - 110	121323191
Chloride	10.0	10.0	mg/L	100	90.0 - 110	121323213
Chloride	10.1	10.0	mg/L	101	90.0 - 110	121323214
Chloride	10.1	10.0	mg/L	101	90.0 - 110	121323219
Chloride	10.1	10.0	mg/L	101	90.0 - 110	121323221

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Chloride	903766	4.87	4.94	5.00	85.0 - 110	97.4	98.8	mg/L	1.43	20.0

MSD

Parameter	Sample	MS	MSD	UNK	Known	Limits	MS%	MSD%	Units	RPD	Limit%
Chloride	1898522	325	352	229	100	80.0 - 120	96.0	123 *	mg/L	24.7 *	20.0
Chloride	1898879	14.9	14.7	7.05	10.0	80.0 - 120	78.5 *	76.5 *	mg/L	2.58	20.0

Analytical Set 904139 — EPA 300.0 2.1

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Chloride	904139	0.094	0.0053	0.300	mg/L	121332435
Sulfate	904139	0.048	0.00775	0.300	mg/L	121332435

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Chloride	10.1	10.0	mg/L	101	90.0 - 110	121332432
Chloride	10.3	10.0	mg/L	103	90.0 - 110	121332448
Sulfate	9.41	10.0	mg/L	94.1	90.0 - 110	121332432
Sulfate	9.52	10.0	mg/L	95.2	90.0 - 110	121332448

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Chloride	904139	5.14	5.17	5.00	85.0 - 110	103	103	mg/L	0.582	20.0
Sulfate	904139	4.83	4.84	5.00	88.0 - 110	96.6	96.8	mg/L	0.207	20.0

MSD

Parameter	Sample	MS	MSD	UNK	Known	Limits	MS%	MSD%	Units	RPD	Limit%
Chloride	1898914	284	284	198	100	80.0 - 120	86.0	86.0	mg/L	0	20.0
Sulfate	1898914	1890	1920	1830	100	80.0 - 120	60.0 *	90.0	mg/L	40.0 *	20.0

Analytical Set 904159 — EPA 300.0 2.1

NELAP-accredited #T104704201-20-17

Quality Control

ANALAB
Testing the Limits of Science and Service

AQU5-C

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Project
925842

Printed 07/01/2020

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Sulfate	904159	0.012	0.0109	0.300	mg/L	121332864

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Sulfate	9.99	10.0	mg/L	99.9	90.0 - 110	121332860
Sulfate	9.96	10.0	mg/L	99.6	90.0 - 110	121332876

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Sulfate	904159	5.00	5.00	5.00	88.0 - 110	100	100	mg/L	0	20.0

MSD

Parameter	Sample	MS	MSD	UNK	Known	Limits	MS%	MSD%	Units	RPD	Limit%
Sulfate	1898915	1480	1480	1350	100	80.0 - 120	130 *	130 *	mg/L	0	20.0

* Out RPD is Relative Percent Difference: abs(r1-r2) / mean(r1,r2) * 100% Recover% is Recovery Percent: result / known * 100%

Blank - Method Blank; CCV - Continuing Calibration Verification

NELAP-accredited #T104704201-20-17

AQUA-TECH LABORATORIES, INC.

ATL - Bryan Facility:
635 Phil Gramm Blvd.
Bryan, TX 77807
(979) 778-3707
Fax (979) 778-3193

ATL - Austin Facility:
7500 Hwy 71 W, Suite 105
Austin, TX 78735
(512) 301-9559
Fax (512) 301-9552

Chain-of-Custody & Analysis Request

SHIPPED TO:
Ana-Lab Corp. (NELAP Cert. T104704201)
2600 Dudley Road
Kilgore, TX 75662
Phone: (903) 984-0551
Fax: (903) 984-5914

C-O-C #

648 - D020305

T104704371

All analyses must be performed by a TNI approved method certified by the TCEQ. Contact ATL's sample custodian via voice and email if your methods do not meet this criteria.

Analysis Request for:	**Sample ID: D020305-01**	Sampled: 06/23/20 10:00	Matrix: Drinking Water	**Laboratory ID >>** 1898914
Chloride - EPA 300.0	SO4 DW - EPA 300.0			
Analysis Request for:	**Sample ID: D020305-02**	Sampled: 06/23/20 12:00	Matrix: Drinking Water	**Laboratory ID >>** 915
Chloride - EPA 300.0	SO4 DW - EPA 300.0			

CONTAINERS SUPPLIED: (ATL indicates cooler number in parentheses for each container - only required if more than one cooler listed below.)

( ) D020305-01 [C] - Cl SO4 0.25LP
( ) D020305-02 [C] - Cl SO4 0.25LP

Relinquished by: (print & sign) [X] ATL-Austin [ ] ATL - Bryan [ ] Sampler			Date	Time	Iced / Custody Sealed / Not Chilled
Kelly Kukowski			6/23/20	15:53	
Carrier & Tracking Number:	Cooler 1: AQU5 - 25844236				Sample Info "X" all that apply
Lone Star					
Received by: (print & sign) [ ] Received in Lab			Date	Time	Received Iced / CTU / Condition Good / Not Rec'd Iced
RayShawn Thompson			6/24/20	0910	

Line below documents condition at receipt in lab (shipped to) listed above.

Cooler Temperature (°C)	Temp. Read (TR)	Corrected Temp. (CT)	Thermometer ID
Cooler 1			
N/A	N/A	N/A	

Please email reports to: reporting@aqua-techlabs.com

Please return cooler(s) to: Austin Facility

Abbreviations: DW - Drinking Water; NP - Non-Potable Water; S - Solid; CTU - Custody Transfer Unbroken; StP - Sterile Plastic; LP - Liter Plastic; LG - Liter Glass

Aqua-Tech Comments and Special Instructions

5 DAY TAT

See Attached for Tracking # and Temp

BRET

925842 CoC Print Group 001 of 001

LSO
It's all in the delivery.

Airbill No. Z5844236

LSO
1-800-800-8984
www.lso.com

SHIP TO:
RECEIVING
ANA LAB CORP
2600 DUDLEY RD
KILGORE, TX 75662
9039840551

From:
KELLY KUKOWSKI
AQUA TECH LABS
7500 HWY 71 W STE 105
AUSTIN, TX 78735
5123019559

GGGG **LSO ECONOMY NEXT DAY**
3:00 IN MOST AREAS
LATER IN REMOTE AREAS

PRINT DATE: 6/23/2020 REF 3:
QUICKCODE: WEIGHT: 25.00LBS
REF 1: 1D00V.0000 REF 2:

6/24 0910 RT
Date Time Tech
Temp: 1.3/1.3 C
Therm#: 6205 Corr Fact: 0.0 C

Fold on above line and place shipping label in pouch on package. Please be sure the barcodes and addresses can be read and scanned. Shipping Instructions

1. Fold this page along the horizontal line above.
2. Place this Airbill in the shipping label pouch on the package you are shipping. Please be sure the barcodes and addresses can be read and scanned.
3. To locate a drop box near you, click on **Find A Drop Box** from the home page main menu.
4. To schedule a pickup, click on **Request Pickup**.

WARNING: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your Lone Star Overnight account number.

This label is valid for use for 3 months from the date printed. Use of expired labels may result in delayed billing and / or additional research charges. LIMIT OF LIABILITY: We are not responsible for claims in excess of $100 for any reason unless you: 1) declare a greater value (not to exceed $25,000); 2) pay an additional fee; 3) and document your actual loss in a timely manner. We will not pay any claim in excess of the actual loss. We are not liable for any special or consequential damages. Additional limitations of liability are contained in our current Service Guide. If you ask us to deliver a package without obtaining a delivery signature, you release us of all liability for claims resulting from such service. NO DELIVERY SIGNATURE WILL BE OBTAINED FOR 8:30 AM DELIVERIES OR RESIDENTIAL DELIVERIES.

Email information for report date:

7/2/20 10:28

D020306

Apex Drilling

Attn: Michael Becker

apexdrilling.becker@yahoo.com

PO Box 867

Marble Falls, TX 78654

COVID-19 UPDATE:

Aqua-Tech understands the concerns our clients have about the impact of COVID-19. Although we cannot predict what government or supply chain restrictions might develop, we have no plans to cease or limit our field and lab services.

We are following CDC recommendations and taking precautions to keep our clients and employees safe. This includes additional sanitation procedures and implementation of enhanced procedures for sample receiving. ATL is asking clients to help by placing samples in designated areas and using provided sanitizer. We also request any client that may be ill or may have been exposed to COVID-19 to contact us before entering our facilities. We will work out an individualized receipt protocol in these cases.

Thank you for your business,
June M. Brien
Executive Technical Director

CORPORATE OFFICE
635 Phil Gramm Boulevard
Bryan, TX 77807
Phone: (979) 778-3707
Fax: (979) 778-3193

AQUA-TECH LABORATORIES, INC.

AUSTIN OFFICE
7500 Hwy 71 W, Suite 105
Austin, TX 78735
Phone: (512) 301-9559
Fax: (512) 301-9552

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The following abbreviations indicate certification status:

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INF	Aqua-Tech Laboratories, Inc. is not accredited for this parameter. It is reported on an informational basis only.

Subcontracted data summarized in this report is indicated by "Sub" in the Lab column.

TCEQ DW Lab ID TX 239

General Definitions:

NR	Not Reported.
RPD	Relative Percent Difference.
% R	Percent Recovery.
dry	Results with the "dry" unit designation are reported on a "dry weight" basis.
SQL	The Sample Quantitation Limit is the value below which the parameter cannot reliably be detected. The SQL includes all sample preparations, dilutions and / or concentrations.
Adj MDL	The Adjusted Method Detection Limit is the MDL value adjusted for any sample dilutions or concentrations .
MDL	The Method Detection Limit is the lowest theoretical value that is statistically different from zero for a specific method, taking into account all preparation steps and instrument settings.

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Copies of Aqua-Tech Laboratories, Inc. procedures and individual sampling plans are available upon request. Note that samples are collected by Aqua-Tech Laboratories, Inc. personnel unless otherwise noted in the "Sample Collected" field of this report as "Client" or "CLT".

Samples included in this report were received in acceptable condition according to Aqua-Tech Laboratories, Inc. procedures and 40 CFR, Chapter I, Subchapter D, Part 136.3, TABLE II. - *Required containers, preservation techniques, and holding times*, unless otherwise noted in this report.

Record Retention:

All reports, raw data, and associated quality control data are kept on file for 10 years before being destroyed. Any client that would like copies of records must contact Aqua-Tech Laboratories, Inc. no later than six months prior to the scheduled disposal. An administrative fee for retrieval and distribution will apply.

This report was approved by:

June M. Brien, Technical Director

corp@aqua-techlabs.com www.aqua-techlabs.com

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AUSTIN OFFICE
7500 Hwy 71 W, Suite 105
Austin, TX 78735
Phone: (512) 301-9559
Fax: (512) 301-9552

Analytical Report

Apex Drilling

Report Printed: **7/2/20** **10:28**

D020306

RED OAK NO8

Collected: 06/22/20 12:00 by CLIENT
Received: 06/23/20 15:20 by Christie Tonnu

Type: Grab
Matrix: Drinking Water
C-O-C #: D020305-7

Lab ID# D020306-01

	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
Microbiological Analyses											
Total Coliforms	**Absent**	N/A		N/A	**N/A**	N/A	*Austin*	06/23/20 17:05 JLL	SM9223 B 2004	M115001	NEL
Escherichia coli (E.coli)	**Absent**	N/A		N/A	**N/A**	N/A	*Austin*	06/23/20 17:05 JLL	SM9223 B 2004	M115001	NEL

Microbiological Analyses - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	Log10 Comparison Range	Log10 Comparison Control Limit	Batch	
Escherichia coli (E.coli) - SM9223 B 2004														*Austin*
Blank	Absent	N/A		N/A	N/A	06/23/20 17:05 JLL							M115001	
Total Coliforms - SM9223 B 2004														*Austin*
Blank	Absent	N/A		N/A	N/A	06/23/20 17:05 JLL							M115001	

Sample Preparation Summary

Sample	Method	Prepared	Lab	Bottle	Initial	Units	Final	Units	External Dilution Factor	Batch
D020306-01										
Escherichia coli (E.coli)	SM9223 B 2004	6/23/20 17:00 JLL	Austin	A	100	mL	100	mL	1	M115001
Total Coliforms	SM9223 B 2004	6/23/20 17:00 JLL	Austin	A	100	mL	100	mL	1	M115001

Chain-of-Custody and Analysis Request

AQUA-TECH LABORATORIES, INC.

Client /Project:

Contact Info

Name: Apex Drilling
Address: 100 Spanish Oak Trail
City: Spicewood State: TX Zip: 78669
Phone / Email: 830-693-6770

Definitions

DW - Drinking Water
NP - Non-Potable Water
S - Solid
CM - Custody Maintained
CTU - Custody Transfer Unbroken
CT - Corrected Temperature
SUB - Subcontracted Analysis
(+) Container Type: P - Plastic, G - Glass, T - Teflon©

T104704371
TX239

Aqua-Tech Laboratories, Inc.

Austin: 7500 Hwy 71 W Suite 105, Austin, TX 78735, 512.301.9559
Bryan: 635 Phil Gramm Blvd., Bryan, TX 77807, 979.778.3707

Test results meet all accreditation/certification requirements unless stated otherwise.

Work Order / C-O-C: D020305-7
Page 1 of 1
V-0023 R03

By relinquishing the samples listed below to Aqua-Tech, the client agrees to the following terms.
Samples will be analyzed by a method that is within Aqua-Tech Laboratories' NELAC fields of accreditation. Analytes requiring a certified method that is not within Aqua-Tech's fields of accreditation will be subcontracted to a NELAC certified lab that is certified for that method. Clients will be notified of the subcontract lab's details. Other analytes not requiring accreditation will be analyzed by a compendial method. If a specific method is required, the client will note the method in the "Analysis Requested" column. The client approves all method modifications documented by Aqua-Tech or the subcontract lab. A current list of Aqua-Tech's NELAC fields of accreditation and other methods are available on request.

Sample Custody

Relinquished by (print & sign)	Sampler / Client / ATL Field	Date 6.23.20 Time 15:20	Iced / Refrig / Custody Sealed
Received by (print & sign)	Client / ATL Field	Date / Time	Iced / Refrig / CM / CTU
Relinquished by (print & sign)	Client / ATL Field	Date / Time	Iced / Refrig / CM / CTU
Received by (print & sign)	Client / ATL Field	Date / Time	Iced / Refrig / CM / CTU
Relinquished by (print & sign)	Client / ATL Field	Date / Time	Iced / Refrig / CM / CTU / sealed
Received by (print & sign)	christie Tonnu CTT / Lab	Date 6/23/20 Time 1520	Cond Good / Iced / Refrig / CM / CTU

Client Comments:

*** Preservatives**

1 < 6 °C (unfrozen)
2 H2SO4
3 HCl
4 HNO3
5 Na2S2O3
6 NaOH
7

Receipt in Lab

Cooler ID: clt
Temperature (°C): read / CT: 9.6/9.6
Preservation Correct ? YES NO
Post Preservatives ? YES NO
Thermometer ID: 0715570
pH Paper ID: 0744948

Lab Comments: A wrong info <CTT>

Field Sample ID (record field data for each sample in space below)	Start Date	Start Time	End Date	End Time	Composite Type	Sample Matrix	Container(s) Bottle Count	Volume (Size in L)	Type (+)	Preserv-ative(s) *	LAB USE ONLY BELOW (initials CTT) Cooler ID	pH Check	SUB	WORK ORDER NA
RED OAK #5	6-23-20	10:40			Grab	DW	1	0.12 L	StP	1, 5	clt	–	–	Sample DO20306-01A
Analysis Requested & Comments: Cl, conductivity, F, NO3, Total Coliform P/A, metals: Fe, Mn, pH, TDS, sulfate, total hardness							1	2L	P	1		–	Aqua Lab	NA DO20305-01A
														MEC(2)
RED OAK #8	6-23-20	12:00					1	0.12L	P	4,5	clt	–	–	Sample DO20307-01A
Analysis Requested & Comments: See sample analysis list Above. <SW>							1	2L	P	1		–	Aqua Lab	NA DO20305-02A
														MEC(2)
														Sample
Analysis Requested & Comments:														
														Sample
Analysis Requested & Comments:										MEC(2)				
														Sample
Analysis Requested & Comments:														

Water Quality

Well No. 6

Email information for report date:

7/21/20 11:11

D021175

Apex Drilling

Attn: Michael Becker

apexdrilling.becker@yahoo.com

PO Box 867

Marble Falls, TX 78654

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Austin, TX 78735
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TCEQ DW Lab ID TX 239

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corp@aqua-techlabs.com www.aqua-techlabs.com

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Austin, TX 78735
Phone: (512) 301-9559
Fax: (512) 301-9552

Analytical Report

Apex Drilling

Report Printed: **7/21/20** **11:11**

D021175

Apex Drilling RED OAK WELL 6

Collected: 06/30/20 13:00 by CLIENT
Received: 06/30/20 15:00 by Christie Tonnu

Type: Grab
Matrix: Drinking Water
C-O-C #: D021175

Lab ID# D021175-01

	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
General Chemistry											
Total Dissolved Solids	**2900**	mg/L		25.0	100	100	*Bryan*	07/01/20 09:00 MRH	SM2540 C 2011	M115291	NEL
Nitrate as N (NO3N)	**0.0266**	mg/L			0.0200	0.0200	*Austin*	07/02/20 10:34 JLL	SM4500-NO3-F 2011	[CALC]	NEL
Nitrite as N	**<0.01**	mg/L	J (0.004)	0.002	0.002	0.01	*Austin*	07/02/20 10:34 JLL	SM4500 NO2- B 2011	M115421	NEL
Nitrate/Nitrite as N	**0.03**	mg/L		0.02	0.02	0.02	*Bryan*	07/01/20 10:21 MRB	SM4500-NO3-F 2011	M115337	ANR
Total Hardness (EDTA) as CaCO3	**1730**	mg/L	C-02	1.00	10.0	10.0	*Bryan*	07/06/20 18:33 MRH	SM2340 C 2011	M115533	NEL
Fluoride	**2.39**	mg/L		0.04	0.04	0.10	*Bryan*	07/07/20 19:40 MRH	SM4500-F C 2011	M115588	NEL
pH, Lab	**7.6**	S.U.	Hold-03		N/A	N/A	*Austin*	07/01/20 13:00 MSA	SM4500-H+ B 2011	M115369	DWP
Temperature @ pH Analysis	**20.2**	Deg. C			N/A	N/A	*Austin*	07/01/20 13:00 MSA	SM4500-H+ B 2011	M115369	DWP
Specific Conductance (adjusted to 25.0°C)	**4080**	uS/cm		2.00	8.67	8.67	*Bryan*	07/10/20 15:42 MRG	SM2510 B 2011	M115786	NEL
Metals (Total)											
Iron	**0.092**	mg/L		0.002	0.002	0.010	*Bryan*	07/07/20 19:30 PNS	EPA 200.7 R4.4	M115531	NEL
Manganese	**13.7**	ug/L		0.108	0.111	0.412	*Bryan*	07/09/20 20:15 MRG	EPA 200.8 R5.4	M115619	NEL

MEMO COPIED FROM D019479-01:
Please see the attached sub-contract report for sub-contracted analysis.

Explanation of Notes

C-02	Result confirmed by re-analysis.
Hold-03	This parameter was outside of EPA holding at the time the sample was received in the laboratory.
J	Analyte detected below the SQL but above the MDL.

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Bryan, TX 77807
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Analytical Report

Apex Drilling

Report Printed: 7/21/20 11:11

D021175

General Chemistry - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Fluoride - SM4500-F C 2011														*Bryan*
Initial Cal Check	0.43	mg/L				07/07/20 19:40 MRH	0.428		101	90 - 110			2007068	
Blank	<0.10	mg/L		0.04	0.10	07/07/20 19:40 MRH							M115588	
LCS	0.75	mg/L		0.04	0.10	07/07/20 19:40 MRH	0.798		93.9	90 - 110			M115588	
LCS Dup	0.77	mg/L		0.04	0.10	07/07/20 19:40 MRH	0.798		96.4	90 - 110	2.63	6.23	M115588	
Matrix Spike	3.21	mg/L		0.04	0.10	07/07/20 19:40 MRH	0.798	2.39	103	78.1 - 125			M115588	
Matrix Spike Dup	3.21	mg/L		0.04	0.10	07/07/20 19:40 MRH	0.798	2.39	103	78.1 - 125	0.00	5.72	M115588	
MRL Check	0.10	mg/L		0.04	0.10	07/07/20 19:40 MRH	0.0998		97.5	73.4 - 118			M115588	
Nitrate/Nitrite as N - SM4500-NO3-F 2011														*Bryan*
Initial Cal Check	1.62	mg/L				07/01/20 10:21 MRB	1.69		96.1	90 - 110			2007005	
Blank	<0.02	mg/L		0.02	0.02	07/01/20 10:21 MRB							M115337	
LCS	0.50	mg/L		0.02	0.02	07/01/20 10:21 MRB	0.500		99.4	91.3 - 109			M115337	
LCS Dup	0.51	mg/L		0.02	0.02	07/01/20 10:21 MRB	0.500		102	91.3 - 109	2.20	6.8	M115337	
Matrix Spike	1.02	mg/L		0.02	0.02	07/01/20 10:21 MRB	0.500	0.48	108	94.7 - 117			M115337	
Matrix Spike Dup	1.02	mg/L		0.02	0.02	07/01/20 10:21 MRB	0.500	0.48	108	94.7 - 117	0.0579	8.65	M115337	
MRL Check	0.02	mg/L		0.02	0.02	07/01/20 10:21 MRB	0.0200		106	70 - 130			M115337	
Nitrite as N - SM4500 NO2- B 2011														*Austin*
Blank	<0.01	mg/L		0.002	0.01	07/02/20 10:34 JLL							M115421	
LCS	0.08	mg/L		0.002	0.01	07/02/20 10:34 JLL	0.0800		103	90 - 110			M115421	
LCS Dup	0.08	mg/L		0.002	0.01	07/02/20 10:34 JLL	0.0800		106	90 - 110	2.49	8.12	M115421	
Matrix Spike	0.06	mg/L		0.002	0.01	07/02/20 10:34 JLL	0.0800	<0.01	76.3	70.6 - 117			M115421	
Matrix Spike Dup	0.06	mg/L		0.002	0.01	07/02/20 10:34 JLL	0.0800	<0.01	74.1	70.6 - 117	2.89	8.18	M115421	
MRL Check	0.01	mg/L		0.002	0.01	07/02/20 10:34 JLL	0.0100		99.2	70 - 130			M115421	
pH, Lab - SM4500-H+ B 2011														*Austin*
Duplicate	7.6	Std Units				07/01/20 13:00 MSA		7.6			0.00	1.18	M115369	
Reference	7.0	Std Units				07/01/20 13:00 MSA	6.86		101	95 - 105			M115369	
Reference	9.2	Std Units				07/01/20 13:00 MSA	9.18		101	95 - 105			M115369	
Reference	6.9	Std Units				07/01/20 13:00 MSA	6.86		101	95 - 105			M115369	
Reference	9.2	Std Units				07/01/20 13:00 MSA	9.18		99.7	95 - 105			M115369	
Specific Conductance (adjusted to 25.0°C) - SM2510 B 2011														*Bryan*
Initial Cal Check	441	uS/cm				07/10/20 15:42 MRG	437		101	85 - 115			2007127	
Blank	<2.00	uS/cm		2.00	2.00	07/10/20 15:42 MRG							M115786	
Duplicate	4060	uS/cm		8.67	8.67	07/10/20 15:42 MRG		4080			0.319	2	M115786	
LCS	1380	uS/cm		2.00	2.00	07/10/20 15:42 MRG	1410		98.2	90 - 110			M115786	

CORPORATE OFFICE
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Bryan, TX 77807
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AQUA-TECH LABORATORIES, INC.

AUSTIN OFFICE
7500 Hwy 71 W, Suite 105
Austin, TX 78735
Phone: (512) 301-9559
Fax: (512) 301-9552

Analytical Report

Apex Drilling

Report Printed: 7/21/20 11:11

D021175

General Chemistry - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Total Dissolved Solids - SM2540 C 2011														*Bryan*
Blank	<25.0	mg/L		25.0	25.0	07/01/20 09:00 MRH							M115291	
Duplicate	1660	mg/L		100	100	07/01/20 09:00 MRH		1640			1.22	9.13	M115291	
Reference	528	mg/L		100	100	07/01/20 09:00 MRH	500		106	81 - 121			M115291	
Total Hardness (EDTA) as CaCO3 - SM2340 C 2011														*Bryan*
Initial Cal Check	50.0	mg/L				07/06/20 18:33 MRH	54.4		91.9	85 - 115			2007056	
Blank	<1.00	mg/L		1.00	1.00	07/06/20 18:33 MRH							M115533	
Duplicate	1750	mg/L		10.0	10.0	07/06/20 18:33 MRH		1730			1.20	9.52	M115533	
LCS	100	mg/L		1.00	1.00	07/06/20 18:33 MRH	100		100	90 - 110			M115533	
LCS Dup	102	mg/L		1.00	1.00	07/06/20 18:33 MRH	100		102	90 - 110	2.06	6.47	M115533	
Matrix Spike	2810	mg/L		10.0	10.0	07/06/20 18:33 MRH	1000	1730	108	87.6 - 111			M115533	
MRL Check	4.17	mg/L		1.00	1.00	07/06/20 18:33 MRH	4.00		104	70 - 130			M115533	

Metals (Total) - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Iron - EPA 200.7 R4.4														*Bryan*
Blank	<0.010	mg/L		0.002	0.010	07/07/20 18:37 PNS							M115531	
LCS	0.957	mg/L		0.002	0.010	07/07/20 18:40 PNS	1.00		95.7	84.5 - 115.4			M115531	
LCS Dup	0.955	mg/L		0.002	0.010	07/07/20 18:43 PNS	1.00		95.5	84.5 - 115.4	0.221	20	M115531	
Duplicate	0.031	mg/L		0.002	0.010	07/07/20 18:47 PNS		0.031			0.188	20	M115531	
Matrix Spike	0.939	mg/L		0.002	0.010	07/07/20 18:50 PNS	1.00	0.031	90.8	69.5 - 130.4			M115531	
Manganese - EPA 200.8 R5.4														*Bryan*
Blank	<0.412	ug/L		0.111	0.412	07/09/20 17:54 MRG							M115619	
LCS	10.1	ug/L		0.112	0.416	07/09/20 18:04 MRG	10.0		101	84.5 - 115.4			M115619	
LCS Dup	9.74	ug/L		0.112	0.416	07/09/20 18:14 MRG	10.0		97.4	84.5 - 115.4	3.18	20	M115619	
Duplicate	0.451	ug/L		0.111	0.412	07/09/20 18:24 MRG		0.436			3.41	20	M115619	
Matrix Spike	10.1	ug/L		0.112	0.416	07/09/20 18:34 MRG	10.0	0.436	96.6	69.5 - 130.4			M115619	

Preparation Procedures - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Turbidity - SM2130 B 2011														*Bryan*
Initial Cal Check	4.3	NTU				05/26/20 20:44 MRH	4.65		93.1	90 - 110			2005292	

CORPORATE OFFICE
635 Phil Gramm Boulevard
Bryan, TX 77807
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7500 Hwy 71 W, Suite 105
Austin, TX 78735
Phone: (512) 301-9559
Fax: (512) 301-9552

Analytical Report

Apex Drilling

Report Printed: **7/21/20** **11:11**

D021175

Sample Preparation Summary

Sample	Method	Prepared	Lab	Bottle	Initial	Units	Final	Units	External Dilution Factor	Batch
D021175-01										
Fluoride	SM4500-F C 2011	7/7/20 19:40 MRH	Bryan	D	25.0	mL	25.0	mL	1	M115588
Iron	EPA 200.7 R4.4	7/6/20 16:32 BLC	Bryan	E	10.0	mL	10.2	mL	1	M115531
Manganese	EPA 200.8 R5.4	7/8/20 10:09 AOG	Bryan	E	10.0	mL	10.3	mL	1	M115619
Nitrate/Nitrite as N	SM4500-NO3-F 2011	7/1/20 8:21 MRB	Bryan	B	10.0	mL	10.0	mL	1	M115337
Nitrite as N	SM4500 NO2- B 2011	7/2/20 10:34 JLL	Austin	A	25.0	mL	25.0	mL	1	M115421
pH, Lab	SM4500-H+ B 2011	7/1/20 13:00 MSA	Austin	A	50.0	mL	50.0	mL	1	M115369
Sample Acidified to pH<2 in Lab	N/A	6/30/20 15:34 KK	Bryan	E	100	mL	100	mL	1	M115283
Specific Conductance (adjusted to 25.0°C)	SM2510 B 2011	7/10/20 15:42 MRG	Bryan	D	30.0	mL	130	mL	1	M115786
Temperature @ pH Analysis	SM4500-H+ B 2011	7/1/20 13:00 MSA	Austin	A	50.0	mL	50.0	mL	1	M115369
Total Dissolved Solids	SM2540 C 2011	7/1/20 9:00 MRH	Bryan	D	25.0	mL	100	mL	1	M115291
Total Hardness (EDTA) as CaCO3	SM2340 C 2011	7/6/20 18:33 MRH	Bryan	E	5.00	mL	50.0	mL	1	M115533
Turbidity	SM2130 B 2011	7/6/20 10:16 AOG	Bryan	E	10.0	mL	10.0	mL	1	M115510
D021175-01RE1										
Sample Acidified to pH<2 in Lab	N/A	6/30/20 15:34 KK	Bryan	B	100	mL	100	mL	1	M115282

AQUA-TECH LABORATORIES, INC.

Chain-of-Custody and Analysis Request

Aqua-Tech Laboratories, Inc.
Austin: 7500 Hwy 71 W Suite 105, Austin, TX 78735, 512.301.9559
Bryan: 635 Phil Gramm Blvd., Bryan, TX 77807, 979.778.3707

T104704371
TX239

Test results meet all accreditation/certification requirements unless stated otherwise.

Work Order / C-O-C: D021175
Page 1 of 1
V-0023 R03

Client /Project:

Contact Info
- Name: Apex Drilling
- Address: 100 Spanish Oak Trail
- City: Spicewood State: TX Zip: 78669
- Phone / Email: 830-693-6770

Definitions
- DW - Drinking Water
- NP - Non-Potable Water
- S - Solid
- CM - Custody Maintained
- CTU - Custody Transfer Unbroken
- CT - Corrected Temperature
- SUB - Subcontracted Analysis

(+) Container Type
- P - Plastic
- G - Glass
- T - Teflon©

By relinquishing the samples listed below to Aqua-Tech, the client agrees to the following terms.
Samples will be analyzed by a method that is within Aqua-Tech Laboratories' NELAC fields of accreditation. Analytes requiring a certified method that is not within Aqua-Tech's fields of accreditation will be subcontracted to a NELAC certified lab that is certified for that method. Clients will be notified of the subcontract lab's details. Other analytes not requiring accreditation will be analyzed by a compendial method. If a specific method is required, the client will note the method in the "Analysis Requested" column. The client approves all method modifications documented by Aqua-Tech or the subcontract lab. A current list of Aqua-Tech's NELAC fields of accreditation and other methods are available on request.

Sample Custody

	Signature	Checkbox	Date / Time	Condition
Relinquished by (print & sign)	M BECKER	Sampler ☐ Client ☑ ATL Field ☐	Date 6-30-20 Time 15:00	Iced / Refrig ☐ Custody Sealed ☐
Received by (print & sign)		Client ☐ ATL Field ☐	Date Time	Iced / Refrig ☐ CM / CTU ☐
Relinquished by (print & sign)	NFE<CTT>	Client ☐ ATL Field ☐	Date Time	Iced / Refrig ☐ CM / CTU ☐
Received by (print & sign)		Client ☐ ATL Field ☐	Date Time	Iced / Refrig ☐ CM / CTU ☐
Relinquished by (print & sign)		Client ☐ ATL Field ☐	Date Time	Iced / Refrig ☐ CM / CTU / sealed ☐
Received by (print & sign)	Christie Tonnu CTT	Lab ☑	Date 6/30/20 Time 1500	Cond Good ☑ Iced / Refrig ☐ CM / CTU ☑

Client Comments:

* Preservatives	Receipt in Lab		
1 < 6 °C (unfrozen)	Cooler ID :	none	NACTT
2 H2SO4	Temperature (°C) : read / CT	15.2/15.2 *(2) more entry .<kh	
3 HCl			
4 HNO3	Preservation Correct ?	YES NO	YES NO
5 Na2S2O3	Post Preservatives ?	YES NO	YES NO
6 NaOH	Thermometer ID :	0715570	
7	pH Paper ID :	0755987	

Lab Comments

Field Sample ID (record field data for each sample in space below)	Start Date	Start Time	End Date	End Time	Composite Type	Sample Matrix	Bottle Count	Volume (Size in L)	Type (+)	Preserv-ative(s) *	Cooler ID	pH Check	SUB	WORK ORDER (see below <CTT>)
ZED OAK #6	6-30-20	13:00			Grab	DW	1	0.12	StP	1, 5	none	—	—	Sample 01 D021120
Analysis Requested & Comments: Total Coliform P/A														
ZED OAK #6	6-30-20	13:00	—		G	DW	1	2	P	1	none	—	Ana Accutest	Sample 021 D021175
Analysis Requested & Comments: ~~BACT NO2, NO3, As, F, Al, Cu, Fe, Mn, Zn TDS, Zn TDS Pb SO4 Cl pH Alk Ca as CaCO3 Na~~ (*)														
														Sample
Analysis Requested & Comments: Cl Cond F Fe NO3 NO2 Mn pH SO4 Total Hardness TDS														
														Sample
Analysis Requested & Comments: NFE<CTT>														
														Sample
Analysis Requested & Comments: (*)(2) wrong list. See Below. <kh														

LAB USE ONLY BELOW (initials CTT)

Ana-Lab Corp.
2600 Dudley Rd. Kilgore, Texas 75662
P.O. Box 9000 Kilgore, Texas 75663
*Office: 903-984-0551 * Fax: 903-984-5914*

ANA LAB
Testing the Limits of Science and Service

Project
929422

AQU5-C

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Printed 07/27/2020 9:24

TABLE OF CONTENTS

RR

This report consists of this Table of Contents and the following pages:

NELAP-accredited #T104704201-20-17

Ana-Lab Corp.
2600 Dudley Rd. Kilgore, Texas 75662
P.O. Box 9000 Kilgore, Texas 75663
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ANA LAB
Testing the Limits of Science and Service

AQU5-C

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Project
929422

Report Date: 07/24/2020
Printed: 07/27/2020

RR

RESULTS

Sample Results

1906875 D021175-01 Received: 07/01/2020

Drinking Water Collected by: Client Aqua-Tech Laboratori PO: RR
Taken: 06/30/2020 13:00:00

Supplement to Test Report 1900745

EPA 300.0 2.1 Prepared: 908313 07/23/2020 10:35:00 Analyzed 908313 07/23/2020 10:35:00 ATN

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	Chloride	196 **	mg/L	3.00	C		01

EPA 300.0 2.1 Prepared: 908315 07/23/2020 16:17:00 Analyzed 908315 07/23/2020 16:17:00 ATN

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	Sulfate	1570 **	mg/L	30.0	C		01

** Re-run results confirmed on multiple instruments.

Qualifiers:

C - Confirmed value

We report results on an As Received or wet basis unless marked Dry Weight. Unless otherwise noted, testing was performed at Ana-labs corporate laboratory that holds the following Federal and State certificates: EPA Lab Number TX00063, US Department of Agriculture Soil Import Permit P330-17-00117, Texas Commission on Environmental Quality Commercial Drinking Water Lab Approval (Lab ID: TX219), Texas Commission on Environmental Quality NELAP T104704201-20-17, Louisiana Department of Environmental Quality Laboratory Certification (NELAP, LELAP) #02008, Louisiana Department of Health and Hospitals Drinking Water (NELAP) Certificate No LA026, Oklahoma Department of Environmental Quality TNI Laboratory Accreditation Program Certificate No. 2018-126, Arkansas Department of Environmental Quality Certification #18-068-0. The Accredited column designates accreditation by N -- NELAC, or z -- not covered under NELAC scope of accreditation.
These analytical results relate to the sample tested. This report may NOT be reproduced EXCEPT in FULL without written approval of Ana-Lab Corp. Unless otherwise specified, these test results meet the requirements of NELAC.
RL is the Reporting Limit (sample specific quantitation limit) and is at or above the Method Detection Limit (MDL). CAS is Chemical Abstract Service number. RL is our Reporting Limit, or Minimum Quantitation Level. The RL takes into account the Instrument Detection Limit (IDL), Method Detection Limit (MDL), and Practical Quantitation Limit (PQL), and any dilutions and/or concentrations performed during sample preparation (EQL). Our analytical result must be above this RL before we report a value in the 'Results' column of our report (without a 'J' flag). Otherwise, we report ND (Not Detected above RL), because the result is "<" (less than) the number in the RL column. MAL is Minimum Analytical Level and is typically from regulatory agencies. Unless we report a result in the result column, or interferences prevent it, we work to have our RL at or below the MAL.

NELAP-accredited #T104704201-20-17

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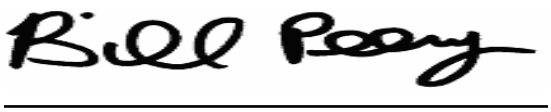
ANA LAB
Testing the Limits of Science and Service

AQU5-C

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Project
929422

Report Date: 07/24/2020
Printed: 07/27/2020



Bill Peery, MS, VP Technical Services

NELAP-accredited #T104704201-20-17

QUALITY CONTROL

ANALAB
Testing the Limits of Science and Service

AQU5-C

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Project
929422

Printed 07/27/2020

Analytical Set 908313 — EPA 300.0 2.1

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Chloride	908313	0.0281	0.0211	0.100	mg/L	121426500

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Chloride	10.2	10.0	mg/L	102	90.0 - 110	121426499
Chloride	10.3	10.0	mg/L	103	90.0 - 110	121426517

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Chloride	908313	5.08	5.07	5.00	85.0 - 110	102	101	mg/L	0.197	20.0

MSD

Parameter	Sample	MS	MSD	UNK	Known	Limits	MS%	MSD%	Units	RPD	Limit%
Chloride	1906725	61.7	61.0	48.7	10.0	80.0 - 120	130 *	123 *	mg/L	5.53	20.0

Analytical Set 908315 — EPA 300.0 2.1

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Sulfate	908315	ND	0.0109	0.300	mg/L	121426541

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Sulfate	10.1	10.0	mg/L	101	90.0 - 110	121426538
Sulfate	10.3	10.0	mg/L	103	90.0 - 110	121426557

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Sulfate	908315	4.91	4.92	5.00	88.0 - 110	98.2	98.4	mg/L	0.203	20.0

MSD

Parameter	Sample	MS	MSD	UNK	Known	Limits	MS%	MSD%	Units	RPD	Limit%
Sulfate	1906726	46.4	47.2	38.7	10.0	80.0 - 120	77.0 *	85.0	mg/L	9.88	20.0
Sulfate	1907090	51.8	51.4	39.9	10.0	80.0 - 120	119	115	mg/L	3.42	20.0

* Out RPD is Relative Percent Difference: abs(r1-r2) / mean(r1,r2) * 100% Recover% is Recovery Percent: result / known * 100%

Blank - Method Blank; CCV - Continuing Calibration Verification

NELAP-accredited #T104704201-20-17

AQUA-TECH LABORATORIES, INC.

ATL - Bryan Facility:
635 Phil Gramm Blvd.
Bryan, TX 77807
(979) 778-3707
Fax (979) 778-3193

ATL - Austin Facility:
7500 Hwy 71 W, Suite 105
Austin, TX 78735
(512) 301-9559
Fax (512) 301-9552

Chain-of-Custody & Analysis Request

SHIPPED TO:
Ana-Lab Corp. (NELAP Cert. T104704201)
2600 Dudley Road
Kilgore, TX 75662
Phone: (903) 984-0551
Fax: (903) 984-5914

C-O-C #
310 - D021175

T104704371

Page 1 of 1

All analyses must be performed by a TNI approved method certified by the TCEQ. Contact ATL's sample custodian via voice and email if your methods do not meet this criteria.

Analysis Request for: **Sample ID: D021175-01** Sampled: 06/30/20 13:00 Matrix: Drinking Water **Laboratory ID >>** 1900745

Chloride - EPA 300.0 SO4 DW - EPA 300.0

CONTAINERS SUPPLIED: (ATL indicates cooler number in parentheses for each container - only required if more than one cooler listed below.)

( ) D021175-01 [C] - Cl SO4 0.25LP
~~[Split from 01A]~~ NA

See Attached for Tracking and Temp

Relinquished by: (print & sign) [X] ATL-Austin [ ] ATL - Bryan [ ] Sampler	Date	Time	Sample Info	Abbreviations
Kelly Kukowski	6/30/20	15:43	[✓] Iced [✓] Custody Sealed [ ] Not Chilled	DW - Drinking Water; NP - Non-Potable Water; S - Solid; CTU - Custody Transfer Unbroken; StP - Sterile Plastic; LP - Liter Plastic; LG - Liter Glass
Carrier & Tracking Number: Lone Star — Cooler 1: AQU5 - Z5846946			Sample Info "X" all that apply	**Aqua-Tech Comments and Special Instructions**
Received by: (print & sign) [✓] Received in Lab — Rayshawn Thompson	7/1/20	0900	[✓] Received Iced [✓] CTU [✓] Condition Good [ ] Not Rec'd Iced	5 DAY TAT

Line below documents condition at receipt in lab (shipped to) listed above.

Cooler Temperature (°C)	Temp. Read (TR)	Corrected Temp. (CT)	Thermometer ID
Cooler 1			
N/A	N/A	N/A	

Please email reports to:
reporting@aqua-techlabs.com

Please return cooler(s) to:
Austin Facility

BRET

929422 CoC Print Group 001 of 001

LSO
It's all in the delivery.

Airbill No. Z5846946

LSO
1-800-800-8984
www.lso.com

SHIP TO:
RECEIVING
ANA LAB CORP
2600 DUDLEY RD
KILGORE, TX 75662
9039840551

From:
KELLY KUKOWSKI
AQUA TECH LABS
7500 HWY 71 W STE 105
AUSTIN, TX 78735
5123019559

GGGG **LSO ECONOMY NEXT DAY**
3:00 IN MOST AREAS
LATER IN REMOTE AREAS

PRINT DATE: 6/25/2020 REF 3:
QUICKCODE: WEIGHT: 25.00LBS
REF 1: 1D00V.0000 REF 2:

7/1 0923 RT
Date Time Tech
Temp: 1.2 / 1.2 C
Therm#: 6205 Corr Fact: 0.0 C

Fold on above line and place shipping label in pouch on package. Please be sure the barcodes and addresses can be read and scanned. Shipping Instructions

1. Fold this page along the horizontal line above.
2. Place this Airbill in the shipping label pouch on the package you are shipping. Please be sure the barcodes and addresses can be read and scanned.
3. To locate a drop box near you, click on **Find A Drop Box** from the home page main menu.
4. To schedule a pickup, click on **Request Pickup**.

WARNING: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your Lone Star Overnight account number.

This label is valid for use for 3 months from the date printed. Use of expired labels may result in delayed billing and / or additional research charges. LIMIT OF LIABILITY: We are not responsible for claims in excess of $100 for any reason unless you: 1) declare a greater value (not to exceed $25,000); 2) pay an additional fee; 3) and document your actual loss in a timely manner. We will not pay any claim in excess of the actual loss. We are not liable for any special or consequential damages. Additional limitations of liability are contained in our current Service Guide. If you ask us to deliver a package without obtaining a delivery signature, you release us of all liability for claims resulting from such service. NO DELIVERY SIGNATURE WILL BE OBTAINED FOR 8:30 AM DELIVERIES OR RESIDENTIAL DELIVERIES.

Email information for report date:

7/2/20 15:12

D021180

Apex Drilling

Attn: Michael Becker

apexdrilling.becker@yahoo.com

PO Box 867

Marble Falls, TX 78654

COVID-19 UPDATE:

Aqua-Tech understands the concerns our clients have about the impact of COVID-19. Although we cannot predict what government or supply chain restrictions might develop, we have no plans to cease or limit our field and lab services.

We are following CDC recommendations and taking precautions to keep our clients and employees safe. This includes additional sanitation procedures and implementation of enhanced procedures for sample receiving. ATL is asking clients to help by placing samples in designated areas and using provided sanitizer. We also request any client that may be ill or may have been exposed to COVID-19 to contact us before entering our facilities. We will work out an individualized receipt protocol in these cases.

Thank you for your business,
June M. Brien
Executive Technical Director

CORPORATE OFFICE
635 Phil Gramm Boulevard
Bryan, TX 77807
Phone: (979) 778-3707
Fax: (979) 778-3193

AQUA-TECH LABORATORIES, INC.

AUSTIN OFFICE
7500 Hwy 71 W, Suite 105
Austin, TX 78735
Phone: (512) 301-9559
Fax: (512) 301-9552

The analyses summarized in this report were performed by Aqua-Tech Laboratories, Inc. unless otherwise noted. Aqua-Tech Laboratories, Inc. holds accreditation from the State of Texas in accordance with TNI and/or through the TCEQ Drinking Water Commercial Laboratory Approval Program.

The following abbreviations indicate certification status:

NEL	TNI accredited parameter.
ANR	Accreditation not required by the State of Texas.
DWP	Accreditation through the TCEQ Drinking Water Commercial Laboratory Approval Program.
INF	Aqua-Tech Laboratories, Inc. is not accredited for this parameter. It is reported on an informational basis only.

Subcontracted data summarized in this report is indicated by "Sub" in the Lab column.

TCEQ DW Lab ID TX 239

General Definitions:

NR	Not Reported.
RPD	Relative Percent Difference.
% R	Percent Recovery.
dry	Results with the "dry" unit designation are reported on a "dry weight" basis.
SQL	The Sample Quantitation Limit is the value below which the parameter cannot reliably be detected. The SQL includes all sample preparations, dilutions and / or concentrations.
Adj MDL	The Adjusted Method Detection Limit is the MDL value adjusted for any sample dilutions or concentrations .
MDL	The Method Detection Limit is the lowest theoretical value that is statistically different from zero for a specific method, taking into account all preparation steps and instrument settings.

All samples are reported on an "as received" basis unless the designation "dry" is added to the reported unit.

Copies of Aqua-Tech Laboratories, Inc. procedures and individual sampling plans are available upon request. Note that samples are collected by Aqua-Tech Laboratories, Inc. personnel unless otherwise noted in the "Sample Collected" field of this report as "Client" or "CLT".

Samples included in this report were received in acceptable condition according to Aqua-Tech Laboratories, Inc. procedures and 40 CFR, Chapter I, Subchapter D, Part 136.3, TABLE II. - *Required containers, preservation techniques, and holding times*, unless otherwise noted in this report.

Record Retention:

All reports, raw data, and associated quality control data are kept on file for 10 years before being destroyed. Any client that would like copies of records must contact Aqua-Tech Laboratories, Inc. no later than six months prior to the scheduled disposal. An administrative fee for retrieval and distribution will apply.

This report was approved by:

June M. Brien, Technical Director

corp@aqua-techlabs.com www.aqua-techlabs.com

CORPORATE OFFICE
635 Phil Gramm Boulevard
Bryan, TX 77807
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AQUA-TECH LABORATORIES, INC.

AUSTIN OFFICE
7500 Hwy 71 W, Suite 105
Austin, TX 78735
Phone: (512) 301-9559
Fax: (512) 301-9552

Analytical Report

Apex Drilling

Report Printed: **7/2/20** **15:12**

D021180

RED OAK NO6

Collected: 06/30/20 13:00 by CLIENT
Received: 06/30/20 15:00 by Christie Tonnu

Type: Grab
Matrix: Drinking Water
C-O-C #: D021175

Lab ID# D021180-01

	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
Microbiological Analyses											
Total Coliforms	**Absent**	N/A		N/A	**N/A**	N/A	*Austin*	06/30/20 17:18 JLL	SM9223 B 2004	M115323	NEL
Escherichia coli (E.coli)	**Absent**	N/A		N/A	**N/A**	N/A	*Austin*	06/30/20 17:18 JLL	SM9223 B 2004	M115323	NEL

Microbiological Analyses - Quality Control

	Result	Units	Notes	MDL	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	Log10 Comparison Range	Log10 Comparison Control Limit	Batch	
Escherichia coli (E.coli) - SM9223 B 2004														*Austin*
Blank	Absent	N/A		N/A	N/A	06/30/20 17:18 JLL							M115323	
Total Coliforms - SM9223 B 2004														*Austin*
Blank	Absent	N/A		N/A	N/A	06/30/20 17:18 JLL							M115323	

Sample Preparation Summary

Sample	Method	Prepared	Lab	Bottle	Initial	Units	Final	Units	External Dilution Factor	Batch
D021180-01										
Escherichia coli (E.coli)	SM9223 B 2004	6/30/20 17:09 JLL	Austin	A	100	mL	100	mL	1	M115323
Total Coliforms	SM9223 B 2004	6/30/20 17:09 JLL	Austin	A	100	mL	100	mL	1	M115323

AQUA-TECH LABORATORIES, INC.

Chain-of-Custody and Analysis Request

Aqua-Tech Laboratories, Inc.
Austin: 7500 Hwy 71 W Suite 105, Austin, TX 78735, 512.301.9559
Bryan: 635 Phil Gramm Blvd., Bryan, TX 77807, 979.778.3707

T104704371
TX239

Test results meet all accreditation/certification requirements unless stated otherwise.

Work Order / C-O-C: D021175
Page 1 of 1
V-0023 R03

Client /Project:

Contact Info
- Name: Apex Drilling
- Address: 100 Spanish Oak Trail
- City: Spicewood State: TX Zip: 78669
- Phone / Email: 830-693-6770

Definitions
- DW - Drinking Water
- NP - Non-Potable Water
- S - Solid
- CM - Custody Maintained
- CTU - Custody Transfer Unbroken
- CT - Corrected Temperature
- SUB - Subcontracted Analysis

(+) Container Type
- P - Plastic
- G - Glass
- T - Teflon©

By relinquishing the samples listed below to Aqua-Tech, the client agrees to the following terms.
Samples will be analyzed by a method that is within Aqua-Tech Laboratories' NELAC fields of accreditation. Analytes requiring a certified method that is not within Aqua-Tech's fields of accreditation will be subcontracted to a NELAC certified lab that is certified for that method. Clients will be notified of the subcontract lab's details. Other analytes not requiring accreditation will be analyzed by a compendial method. If a specific method is required, the client will note the method in the "Analysis Requested" column. The client approves all method modifications documented by Aqua-Tech or the subcontract lab. A current list of Aqua-Tech's NELAC fields of accreditation and other methods are available on request.

Sample Custody

	Signature	Type	Date / Time	Condition
Relinquished by (print & sign)	M BECKER	☐ Sampler ☑ Client ☐ ATL Field	Date 6-30-20 Time 15:00	☐ Iced / Refrig ☐ Custody Sealed
Received by (print & sign)		☐ Client ☐ ATL Field	Date Time	☐ Iced / Refrig ☐ CM / CTU
Relinquished by (print & sign)	NFE<CTT>	☐ Client ☐ ATL Field	Date Time	☐ Iced / Refrig ☐ CM / CTU
Received by (print & sign)		☐ Client ☐ ATL Field	Date Time	☐ Iced / Refrig ☐ CM / CTU
Relinquished by (print & sign)		☐ Client ☐ ATL Field	Date Time	☐ Iced / Refrig ☐ CM / CTU / sealed
Received by (print & sign)	Christie Tonnu CTT	☑ Lab	Date 6/30/20 Time 1500	☑ Cond Good ☐ Iced / Refrig ☑ CM / CTU

Client Comments:

* Preservatives	Receipt in Lab		
1 < 6 °C (unfrozen)	Cooler ID :	none	
2 H2SO4	Temperature (°C) : read / CT	15.2/15.2 *(2) wrong entry <kh	NA<CTT>
3 HCl			
4 HNO3	Preservation Correct ?	YES NO	YES NO
5 Na2S2O3	Post Preservatives ?	YES NO	YES NO
6 NaOH	Thermometer ID :	0715570	
7	pH Paper ID :	0755987	

Lab Comments

LAB USE ONLY BELOW (initials CTT)

Field Sample ID	Start Date	Start Time	End Date	End Time	Composite Type	Sample Matrix	Bottle Count	Volume (Size in L)	Type (+)	Preserv-ative(s) *	Cooler ID	pH Check	SUB	WORK ORDER see below <CTT>
ZED OAK #6	6-30-20	13:00			Grab	DW	1	0.12	StP	1, 5	none	—	—	Sample 01 D021180
Analysis Requested & Comments: Total Coliform P/A														
ZED OAK #6	6-30-20	13:00	—		G	DW	1	2	P	1	none	—	Ann	Sample 02 D021175
Analysis Requested & Comments: ~~BACT NO2, NO3, As, F, Al, Cu, Fe, Mn, Zn, TDS, Zn, TDS, Pb, SO4, Cl, pH, Alk, Ca as CaCO3, Na~~ (*)														
														Sample
Analysis Requested & Comments: Cl Cond F Fe NO3 NO2 Mn pH SO4 Total Hardness TDS														
														Sample
Analysis Requested & Comments: NFE<CTT>														
														Sample
Analysis Requested & Comments: (*)(2) wrong list. See Below. <kh														