

**Electro Purification, LLC:  
Compliance Monitoring Plan**

*for*

**Electro Purification, LLC**

4605 Post Oak Place

Houston, TX 77027

Hays County, Texas

March 2018

WRGS Project No. 100-001-15



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TBPG Firm No: 50038

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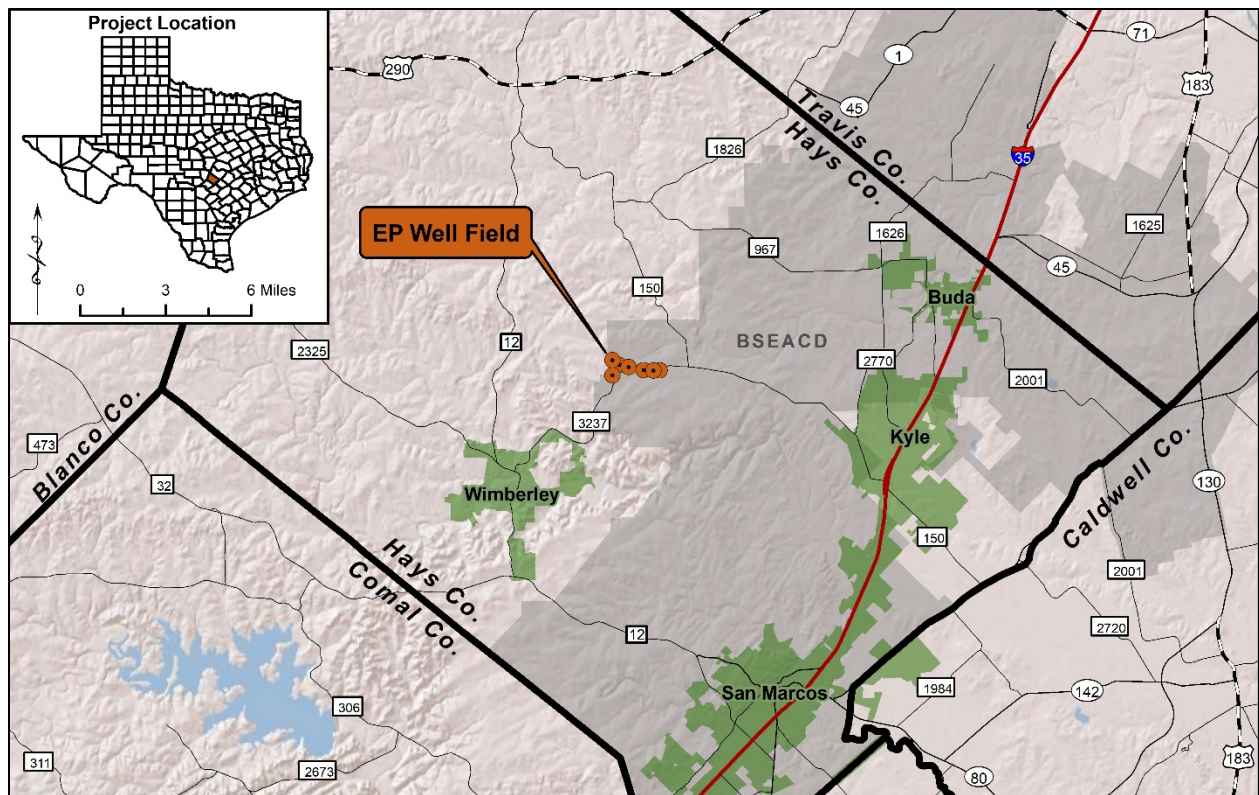
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## **I. General Information**

### **I.1. Introduction**

Pursuant to the Barton Springs Edwards Aquifer Conservation District (the District) Rule 3-1.4.G., Electro Purification, LLC (EP), submits this Compliance Monitoring Plan (the “Plan”), in support of EP’s application for a production permit from the District for a total annual volume of 912,967,200 gallons (~ 2.5 million gallons per day; MGD) from seven wells designated as Bridges Wells No. 1, 2, 3 & 4 and Odell Wells No. 1, 2, & 3. Bridges Wells No. 1 and 2 and Odell Well No. 2 served as the pumping wells for recently completed aquifer testing to meet the requirements of this application and hydrogeologic report (Wet Rock Groundwater Services, 2017). The EP Well Field is located on two properties (Bridges Tract and Odell Tract) containing approximately 1300 acres in Hays County, Texas, located along Ranch to Market (RM) Road 3237 approximately 9 miles northwest of the City of Kyle and 5.5 miles northeast of Wimberley (Figure 1).



**Figure 1: Location Map of EP Well Field**

### **I.2. Hydrogeology and Conceptual Model**

The EP Well Field sits atop a relatively thin portion of the recharge zone of the Edwards Aquifer (Figure 2). The Middle Trinity Aquifer, comprised of the Lower Glen Rose, Hensel (Bexar Shale), and Cow Creek member formations, is under confined conditions in the area of the EP Well Field. Confined groundwater is isolated from the atmosphere at the point of discharge by impermeable geologic formations, and the confined aquifer is generally subject to pressures higher than atmospheric pressure (Driscoll, 1986).



Typically, the highest yielding aquifer of the Trinity Aquifers is the Middle Trinity, specifically the Cow Creek Member of the Travis Peak Formation. This formation is, in some localities, a heavily fractured limestone/dolomite, making it more productive because of its enhanced ability to transmit groundwater.

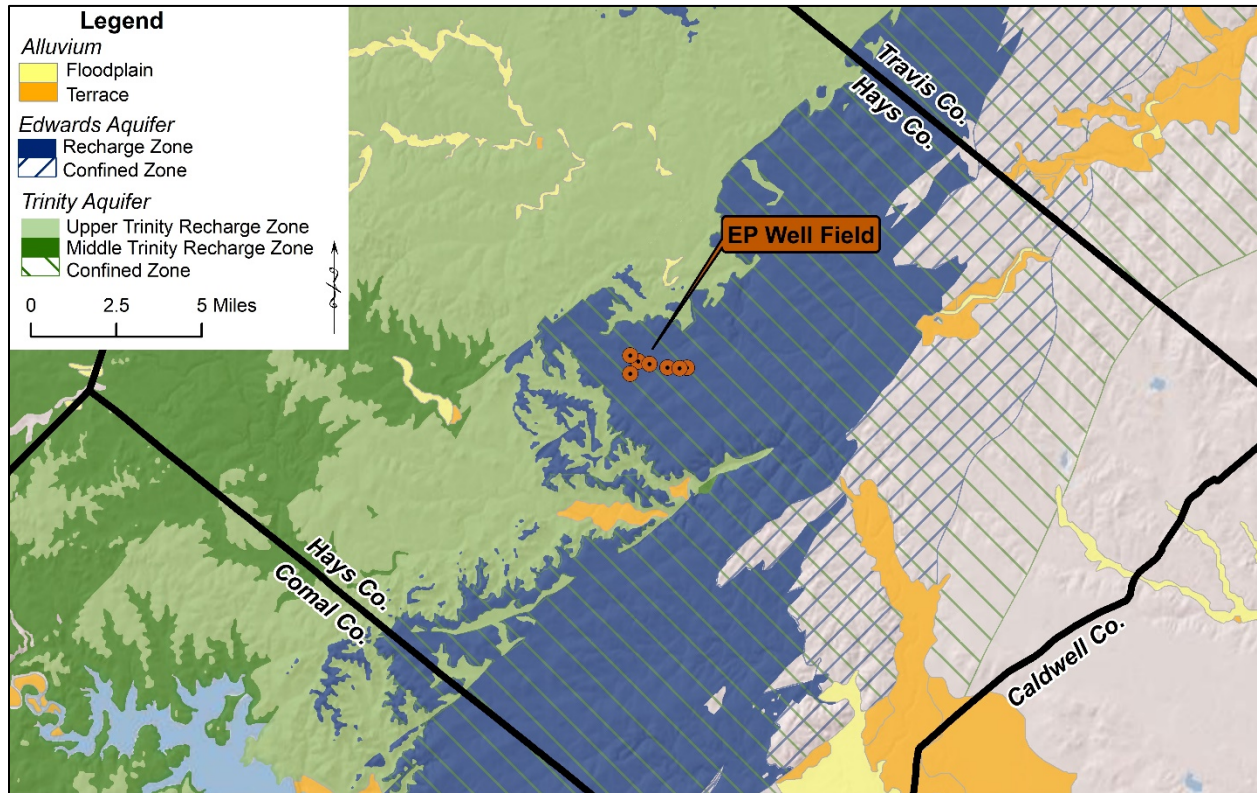


Figure 2: Aquifer Map

Regionally, the Cow Creek Member is hydraulically connected to the Middle Trinity Aquifer especially where the Hensell Sands are present. The Middle Trinity aquifer receives recharge in areas where streams cross the recharge zone and, to a lesser degree, from precipitation infiltration. Regional water level studies (Watson et. al, 2014) indicate that flow is generally from the recharge zone in a southeast direction. Wierman and others (2008) have indicated that faults across the Balcones Fault Zone (BFZ) may be acting as partial barriers to flow. Indications of flow and connection across the aquifer regionally have been shown by Hunt and others (2015), which suggest that flow from the recharge zone moves towards the BFZ and across some faults via relay ramps. Flow across faults occurs where faults have small displacement, or where permeable units are juxtaposed with other permeable units (Hunt et. al, 2015).

Recent aquifer testing utilizing a packer indicated some isolation of the Cow Creek Member to overlying aquifer units (Upper Trinity and Lower Glen Rose formations) over the localized area of the EP Well Field (Wet Rock Groundwater Services, 2017). After reviewing the data collected during the aquifer testing, the Cow Creek Member appears to have little to no direct connection to or communication with the Upper Trinity Aquifer. This can be seen in the lack of drawdown associated with the EP well production during testing in multiple monitor wells completed within the Upper Trinity Aquifer. Based upon the data from the hydrogeologic report documenting the aquifer testing, there also appears to be little connection or

communication between the Cow Creek Member and the Lower Glen Rose Formation (Wet Rock Groundwater Services, 2017). Upon review of the data collected during the aquifer testing, the argument can be made that there is a muted response between the two formations as seen by some delayed response in the monitor wells to pumping at the EP wells.

The source of water for the proposed EP wells over the short term (years) and long-term (decades) is from the Middle Trinity Aquifer. Locally, the data from the EP aquifer testing suggests some compartmentalization of the Cow Creek Member. Initially, water to the EP wells will come from storage in the Cow Creek until a source of recharge is intersected, the timeline of that occurrence is not known based upon the data; that may be on the order of months or years. In the area of the EP Well Field, we do not have enough information to determine the length of time for that intersection to occur. Over the long term, the source of water will come regionally from the aquifer as recharge occurs and moves downgradient.

### **I.3. Project Purpose and Goals**

The EP Wells will produce solely from the Cow Creek Member of the Middle Trinity Aquifer and serve as an additional public water supply source within Hays County for the Goforth Special Utility District (Goforth SUD). A contract is currently in place between EP and the Goforth Special Utility District (Goforth SUD) for EP to deliver water produced from the EP Well Field to Goforth SUD. The overall goal of the EP Project is to provide a sustainable, relatively inexpensive water resource within Hays County, Texas that has experienced unpredicted rapid population growth and development.

According to the General Manager’s preliminary findings , long-term production from the EP Well Field may have “the potential to cause unreasonable impacts,” to surrounding wells. Pursuant to District Rule 3-1.4.G., based upon those preliminary findings, EP has exercised the option to submit and implement a compliance monitoring plan (the “Plan”)(BSEACD, 2017). EP’s Plan includes the following:

1. A compliance monitoring well network that utilizes specified index and monitor wells to measure drawdown and water quality around the EP Well Field; and,
2. A set avoidance measures and actions, including trigger curtailments and/or reductions, that will facilitate the ability to prevent potential unreasonable impacts from occurring.

The purpose of the Plan and monitoring network is to provide (i) the District real-time data needed to assess the impacts of the pumping from the EP Well Field on the Middle Trinity aquifer over time, and (ii) assure compliance with EP’s permit conditions in place to avoid unreasonable impacts.

## **II. Compliance Monitoring Well Network**

In an effort to avoid unreasonable impacts to surrounding well owners, the District will continually monitor water levels and water quality to base production volumes on potentially dynamic aquifer conditions. The water levels will be measured in an Index Well that is currently utilized by the District



(Driftwood Westbay Multiport Well) and multiple monitor wells completed within the Cow Creek, Lower Glen Rose, and Upper Glen Rose formations. Appendix A provides a map of the index and monitor wells in the area of the EP Well Field that will be relied upon to implement the Plan. Appendix B provides a cross-section of the Index Well with proposed Trigger Levels to implement approved avoidance measures.

## II.1. Index Well (Driftwood Westbay Multiport Index Well)

### 1. Cow Creek Port 2 – Avoidance Measures

- a. **Trigger Level 4:** 723 feet below ground surface (ft. bgs) - 100% EP Production cutback. The thought process for Level 4 is that the Cow Creek Member should be saturated at all times. This will allow all Cow Creek wells the ability to produce the volumes of water historically pumped. Pumping levels at the EP Wells will be lower than surrounding wells since most of the production will occur here. The intent for Level 4 is to set a water level at the Index Well which would correlate to a pumping level at the EP Wells near the top of the Cow Creek Member.

We used a level of 25 ft. as the difference in water level from the EP Wells to the Index Well. This means that when the water level at the EP Wells are at the top of the Cow Creek, then the anticipated water level at the Index Well is 25 ft. higher. This was based upon Theis modeling by Wet Rock Groundwater Services, LLC (WRGS) and detailed in our letter to the District dated Dec. 14, 2017. We estimated that combined drawdown would achieve a difference of a) 30 ft. between Bridges Well No. 1 and the Index Well; and b) 20 ft. difference between Bridges Well No. 2 and the Index Well.

The District's estimate of combined drawdown (Figure 5 of Technical Memo 2018-0219; February 2018) estimates a difference of: a) ~40 ft between Odell Well No. 2 and the Index Well; b) ~20 ft difference between Bridges 2 and the Index Well; and c) ~120 ft. difference between Bridges Well No. 1 and the Index Well.

The proposed level of 723 ft. bgs at the Index Well is within the Lower Glen Rose Formation is 25 ft. higher than the top of the Cow Creek Member. At Level 4, 100% cutbacks in pumping by EP will be instituted. This curtailment of production from the EP Well Field will allow ample opportunity for water levels in the aquifer to recover before reaching the Cow Creek Member.

- b. **Trigger Level 3:** 703 ft. bgs - 40% EP Production cutbacks. Level 3 follows the same thought process as Level 4 in its calculation. The intent again is to maintain full saturation of the Cow Creek Member. Level 3 provides for cutbacks of 40% production by EP at a level 20 ft. higher than Level 4. Our intention was to set Level 3 at a level in the Index Well corresponding to a pumping level at the EP Wells at the top of the Hensell/Bexar Shale Formation. The same calculations are used as in Level 4.
- c. **Trigger Level 2:** 672 ft. bgs - 20% EP Production cutbacks. Level 2 is set at the top of the lower reef section of the Lower Glen Rose Formation at the Index Well. Level 2 is 51 ft. higher than Level 4 and its intent is to be set at a hydrogeologic layer; in this case the lower reef section of the Lower Glen Rose Formation.
- d. **Trigger Level 1:** 600 ft. bgs





Level 1 is an observational stage and requires no cutbacks in EP's Well Field production. We set this level 72 ft higher than Level 2 corresponding to an approximate mid-point of the Lower Glen Rose Formation.

The objective of the trigger levels for the Cow Creek Member is to protect the full saturation of the Cow Creek Member and to prevent dewatering. The proposed levels will allow all Cow Creek wells to continue to produce the volumes of water historically utilized, thereby protecting all well owners in the area of the EP Well Field. One concern the District has is protection of Lower Glen Rose wells and if an impact to these wells was seen by pumping the Cow Creek Member. If there is a stronger connection from pumping the Cow Creek Member to the Lower Glen Rose Formation, then Compliance Monitoring Levels set within the Lower Glen Rose Formation will provide protection for these wells. This will allow all Lower Glen Rose well owners to continue to produce what they have historically pumped.

## 2. Lower Glen Rose Port 8 – Avoidance Measures

- a. **Level 4:** 510 ft. bgs - 100% EP Production cutback.  
Level 4 represents the top of the upper reef section of the Lower Glen Rose Formation at the Index Well. The thought process behind Level 4 was to maintain full saturation of the top of the producing section in the Lower Glen Rose Formation. A 100 % cutback in production from the EP Well Field at this level will allow for all Lower Glen Rose wells to produce the volumes of water they have historically pumped.
- b. **Level 3:** 500 ft. bgs - 40% EP Production cutback.  
Level 3 represents a 10 ft. higher water level than Level 4 to allow for sufficient reduction in pumpage from the EP Well Field to maintain saturation of the top of the upper reef section of the Lower Glen Rose Formation.
- c. **Level 2:** 490 ft. bgs - 20% EP Production cutback.  
Level 2 represents a 20 ft. higher water level than Level 4 to allow for sufficient reduction in pumpage from the EP Well Field to maintain saturation of the top of the upper reef section of the Lower Glen Rose Formation.
- d. **Level 1:** 480 ft. bgs  
Level 1 is an observational stage and has no cutbacks in EP Well Field production. We set this level 30 ft. higher than Level 4.

The trigger levels for the Lower Glen Rose Formation are set to protect the full saturation of the production area of the upper reef section. This will allow Lower Glen Rose wells to continue to produce the volumes of water historically utilized and protects well owners in the area. One concern the District has is protection of Lower Glen Rose wells and if an impact to these wells was seen by pumping the Cow Creek Member. These compliance levels will provide protection for these wells.



## II.2. Cow Creek Member Monitor Wells

In addition to the Index Well (Cow Creek Port 2), the following five (5) wells completed in the Cow Creek Member, and a sixth well to be constructed by EP and completed in the Cow Creek Member, will be utilized as Monitoring Wells:

- 1) Bowman Well;
- 2) Ochoa Well;
- 3) Lowe Well;
- 4) Wood 01 Well;
- 5) Escondida Well; and
- 6) EP Western Monitoring Well.

## II.3. Lower Glen Rose Monitor Wells

In addition to the Index Well (Lower Glen Rose Port 8), the following well completed in the Lower Glen Rose Formation will be utilized as a Monitoring Well:

- 1) Odell Well No. 1.

## II.4. Upper Glen Rose Monitor Wells

Based upon the results of the EP aquifer testing reported in Wet Rock Groundwater Services, 2017, we do not see any evidence that production from the Cow Creek Member is hydraulically connected to the Upper Trinity Aquifer. There are many domestic wells completed in the Upper Trinity Aquifer which account, in large part, for the large water level variations that can be observed over short time periods in the Upper Trinity Aquifer. For these reasons, EP has not set any compliance monitoring levels within the Upper Trinity Aquifer. However, EP will pay for or construct an Upper Trinity monitoring well to be located between Bridges Well 1 and Bridges Well 2 to monitor conditions in the aquifer:

- 1) EP UGR Monitoring Well.

## II.5. Well Design and Construction

The designated hydrogeologist is Wet Rock Groundwater Services, LLC and the designated drilling contractor is expected to be Hydro Resources – Midcontinent. Each of the wells are identified on in the map in Appendix A. Table 1 provides a summary of the well construction for each monitoring well; Appendix C provides the available construction datasheets for each of the existing wells. The EP Western and EP UGR wells will be constructed or paid for by EP. EP will also equip the Cow Creek Port 2 & Lower Glen Rose Port 8 in the Driftwood Westbay Multiport Index Well, the new EP Western Monitoring Well, and EP UGR Monitoring Well with transducers capable of measuring water level & temperature and telemetry so that more robust datasets can be collected. Appendix D shows the design schematics for the proposed EP Western and EP UGR monitoring wells.

One concern EP has regarding the Lower Glen Rose is that water levels are not as stable as the Cow Creek Member. Water levels in the Lower Glen Rose rise and fall a larger amount based upon



precipitation. Additionally, there are a number of known illegal dual completed wells in the Lower Glen Rose and Upper Trinity Aquifer. Pumping from these improperly completed wells could affect the readings in the Index Well. Language regarding drawdown caused by third-party groundwater production needs to be included in the compliance monitoring levels established for EP.



**Table 1: EP Well Field Monitoring Well Construction Summary**

Well	Construction Date	Elevation (ft msl)	Aquifer	Borehole Dia. (in)	From (ft bgs)	To (ft bgs)	Casing Type	Casing Size (in)	From (ft bgs)	To (ft bgs)	Pump Set (ft bgs)	Well# (TDLR/TWDB)
Bowman	12-20-2013	1118	MT (CC)	9 6 1/4	0 50	50 850	PVC Screen	5 5	+3 810	810 850	*	353577
Proposed EP Western	9-3-2018**	1162**	MT(CC)	9** 6 1/4**	0	800** 860**	PVC** Open**	5** 6 1/4**	+2** 800**	800** 860**	*	*
Proposed EP UGR	9-3-2018**	1018**	UGR	9** 6 1/4**	0	50** 450**	PVC** Open**	5** 6 1/4**	+2** 50**	50** 450**	*	*
Escondida 1	9-12-2016	1104	MT (CC)	10	0	930	PVC Open	5	+3 877	877 930	*	435981
Lowe	4-15-2015	1070	MT (CC)	7 7/8	0	860	PVC Open	4 1/2	0 840	840 860	760	394760
Ochoa	3-27-2002	1073	MT(CC)	8 3/4 6	0 50	50 810	PVC Screen	5 5	0 ?	810 ?	660	5764605
Odell 1	1-12-2015	1102	LGR	14 3/4 9 7/8	0 565	565 742	PVC Open	10	+2 565	565 742		388355
Wood 01	10-8-2010	1067	MT(CC)	9 6 1/2	0 50	50 790	PVC Screen	5 5	+2 710	710 790	500	233129
Notes: ft. = feet; in. = inches; msl = Mean Seal Level; bgs = Below Ground Surface; * = no data; ** = estimated; LGR = Lower Glen Rose; CC = Cow Creek; UT = Upper Trinity; MT = Middle Trinity												



## II.6. Schedule for Completion of Work

Upon acquiring its production permit from the District, EP proposes a) to complete Bridges Wells No. 1 and 2 and Odell Well No. 2 to public water supply standards, b) drill and complete Bridges Well 3 and 4 and Odell Well 1 and 2 to domestic well standards, c) construct the two new monitoring wells, and d) order/install transducers in the Index Well and identified monitor wells by September 3, 2018.

## II.7. Monitoring Well Access

EP agrees to ensure twenty-four hour access to each monitoring well within the EP Well Field, and will work with the District to secure twenty-four hour access to each monitoring well by third party landowner(s), designated hydrogeologist, drilling contractor, District personnel, and anyone authorized, and acceptable to the District, for data collection and water quality sampling.

## II.8 Maintenance and Repair Commitments

EP designates the hydrogeologist and drilling contractor as the parties responsible for maintaining, repairing, and equipping the monitoring well network and equipment.

## II.9. Water Quality Sampling

In addition to the other monitoring, compliance and avoidance measures outlined in this Plan, EP proposes to contribute \$1,500 per year to the District for water quality sampling of wells in the immediate area of the EP Well Field. Water quality sampling results will be used by the District to monitor changes, if any, over time with production. In addition, if the proper permitting is complete and production ensues, EP will continually monitor water quality per TCEQ public water supply regulations from wells located within the EP Well Field, and report the testing analysis to the District.

## II.10. Jacobs Well

Based upon extensive testing and research of the area, EP does not believe any impacts from production of this permit will affect Jacobs Well. However, in an effort to provide more information on studying the connection or lack thereof to Jacobs Well, EP is offering to drill a monitoring well in the Cow Creek Member (EP Western Monitoring Well) west of the production area towards Jacobs Well. EP will equip this well with a transducer and telemetry to monitor aquifer levels and confirm the non-impacts of production on water levels in the vicinity of Jacobs Well.



### **III. Other Relevant Information**

#### **III.1. Additional Avoidance Measures**

In connection with its request for a permit authorizing the production of up to 2.5 mgd (to be phased-in over time) from the Trinity Aquifer, consistent with District Rule E3-1.4A.10., EP proposes to incorporate the additional “avoidance measures” into its Compliance Monitoring Plan:

1. Based upon the premise of setting its Compliance Monitor Level 2 “trigger” at 672 feet bgs, to be measured at the BSEACD Driftwood Multiport Index Well, EP can identify wells whose pumps appear to have been set at or shallower than the top of the reef section of the Lower Glen Rose Formation – 672 feet bgs. To avoid the potential impact of the Trinity Aquifer level dropping to Compliance Monitor Level 2 trigger, EP proposes to make documented contact with those identified well owners with an “offer” at EP’s expense to lower the well owner’s pump below the Compliance Monitor Level 2 trigger *prior* to EP’s commencement of pumping under the production permit contemporaneously EP’s publication of the required notice of the General Manager’s Preliminary Determination and Recommendation with respect to the EP Permit. Voluntary lowering of pumps below the Level 2 trigger in advance of production from the EP Well Field would avoid the potential for any unreasonable impacts from EP production to the existing wells completed shallower than the Level 2 trigger.
2. EP would provide copies of its correspondence with the respective well owners to the District for its files, as well as provide a summary of any other contacts and communications with those well owners to keep the District apprised of EP’s proactive advance avoidance measure efforts. Assuming the well owner is agreeable to the proposed avoidance measure, EP would coordinate with a qualified licensed contractor to lower the well owner’s pump below the Compliance Monitor Level 2 trigger and, thereafter, provide documentation of that measure to both the well owner and the District.
3. In the event the well owner was not agreeable to the EP proactive avoidance measure proposal EP would document that fact to the District and, thereafter, EP would be allowed to move forward with the development of the EP Well Field consistent with the Plan, including production under its Permit at levels otherwise in compliance with the Plan agreed to with the District and incorporated into the EP Permit.

At such time as EP begins pumping under the Permit, in the event that levels in the Trinity Aquifer begin to approach EP’s agreed upon Compliance Monitor Level 2 trigger, then at such time as the aquifer level is within ( ) feet of the agreed Level 2 trigger, EP again will reach out to any well owners whose pumps were set at or above the 672-foot trigger level prior to the issuance of the EP Permit and who were previously contacted, but were not agreeable to having their wells lowered, *prior* to EP’s commencement of production. EP would provide them with documented notice of the then current aquifer level and include with that notice an offer to lower the well owner’s pump below the Level 2 trigger, using a duly licensed and qualified contractor, to avoid any potential for an unreasonable impact to the well owner’s ability to pump. EP will document its efforts, and the respective well owner’s responses, and provide copies to the District for its files.



### III.2. Mitigation Plan Available

Pursuant to District Rule 3-1.4.G EP is amenable to discussing with the District the development of a mitigation plan to address unanticipated or unavoidable unreasonable impacts to existing wells that were unknown, but in compliance with District rules as a result of production from the EP Well Field. Based upon the substantial hydrogeologic testing and analysis performed by EP to date, coupled with the implementation of its proposed Compliance Monitoring Plan, proactive avoidance measures and proposal to phase levels of production in a stair-step fashion overtime, EP is optimistic that there will be no unanticipated unreasonable impacts from its permitted project. Alternatively, based upon the multiple safeguards incorporated into the EP proposals, the development of any potential for an unanticipated or unavoidable unreasonable impact should be identifiable at an early enough stage that the same can be corrected or avoided by implementation of one or more of the District sanctioned EP safeguards or some form of adaptive management adjustment in production of groundwater from the EP Well Field. If these mechanisms prove unworkable, EP will work with the District to address alternative measures.



**IV. References**

- BSEACD. 2017. Hydrogeologic Setting and Data Evaluation: 2016 Electro Purification Aquifer Test, Cow Creek Well Field: Hays County, Texas. Technical Memo 2017-1010, 73p.
- Driscoll, F.G., 1986. Groundwater and Wells (2<sup>nd</sup>. Ed.): Johnson Division, St. Paul, Minnesota, p. 1021.
- Hunt, B.B., Smith, B.A., Andrews, A.A., Wierman, D.A, Broun, A.S and Gary, M.O. 2015. Influence of Faulting and Relay Ramp Structures on Groundwater Flow in the Karstic Edwards and Trinity Aquifers, Central Texas, USA. International Conference on Groundwater Karst (June 2016) University of Birmingham Programme & Abstracts.
- Watson, J. A., Hunt, B.B., Gary, M.O., Wierman, D.A. and Smith, B.A. 2014. Potentiometric Surface Investigation of the Middle Trinity Aquifer in Western Hays County, Texas. BSEACD Report of Investigation 2014-1002, 25p.
- Wet Rock Groundwater Services, LLC. 2017. Report of Findings – Hydrogeologic Report of the Electro Purification, LLC Cow Creek Well Field. WRGS 17-001, 94 p.
- Wierman, D.A., Broun, A.S., Backus, A.H. and Llano, L. 2008. Cypress Creek/Jacob’s Well Hydrogeologic Report, Hays Trinity Groundwater Conservation District, December 2008, 43p.





# Appendix A: EP Compliance Monitoring Plan Well Network Map

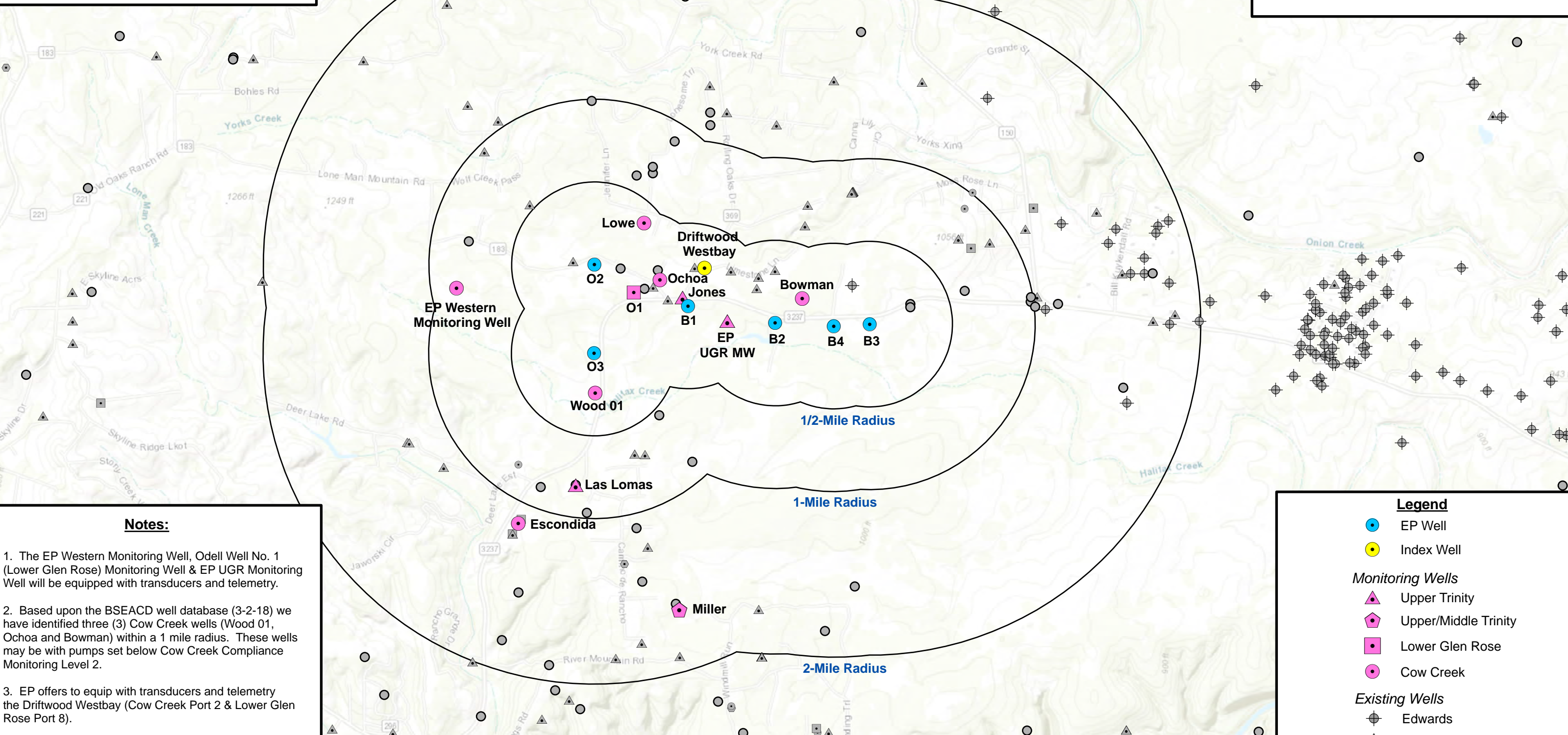


**Westbay Index Well  
(Lower Glen Rose Port 8 W.L. - in feet bgs)**

- Level 1: 480 ft.
- Level 2: 490 ft. (20 % cutbacks)
- Level 3: 500 ft. (40% cutbacks)
- Level 4: 510 ft. (100 % cutbacks)

**Westbay Index Well  
(Cow Creek Port 2 W.L. - in feet bgs)**

- Level 1: 600 ft.
- Level 2: 672 ft. (20 % cutbacks)
- Level 3: 703 ft. (40% cutbacks)
- Level 4: 723 ft. (100 % cutbacks)



**Notes:**

1. The EP Western Monitoring Well, Odell Well No. 1 (Lower Glen Rose) Monitoring Well & EP UGR Monitoring Well will be equipped with transducers and telemetry.
2. Based upon the BSEACD well database (3-2-18) we have identified three (3) Cow Creek wells (Wood 01, Ochoa and Bowman) within a 1 mile radius. These wells may be with pumps set below Cow Creek Compliance Monitoring Level 2.
3. EP offers to equip with transducers and telemetry the Driftwood Westbay (Cow Creek Port 2 & Lower Glen Rose Port 8).

**Legend**

- EP Well
- Index Well
- Monitoring Wells**
- ▲ Upper Trinity
- ◆ Upper/Middle Trinity
- Lower Glen Rose
- Cow Creek
- Existing Wells**
- ⊕ Edwards
- ▲ Upper Trinity
- Lower Glen Rose
- Cow Creek
- Unknown

Note: Aquifer completion estimated based on total depth and may not reflect actual completion due to unknown well construction information.

Scale: 0 1,500 3,000 Feet

Drawn By: KK Date: 3-16-18

Quad Name and No:  
Manvel, TX 29095-D3

Projection: UTM NAD 83 Z 14

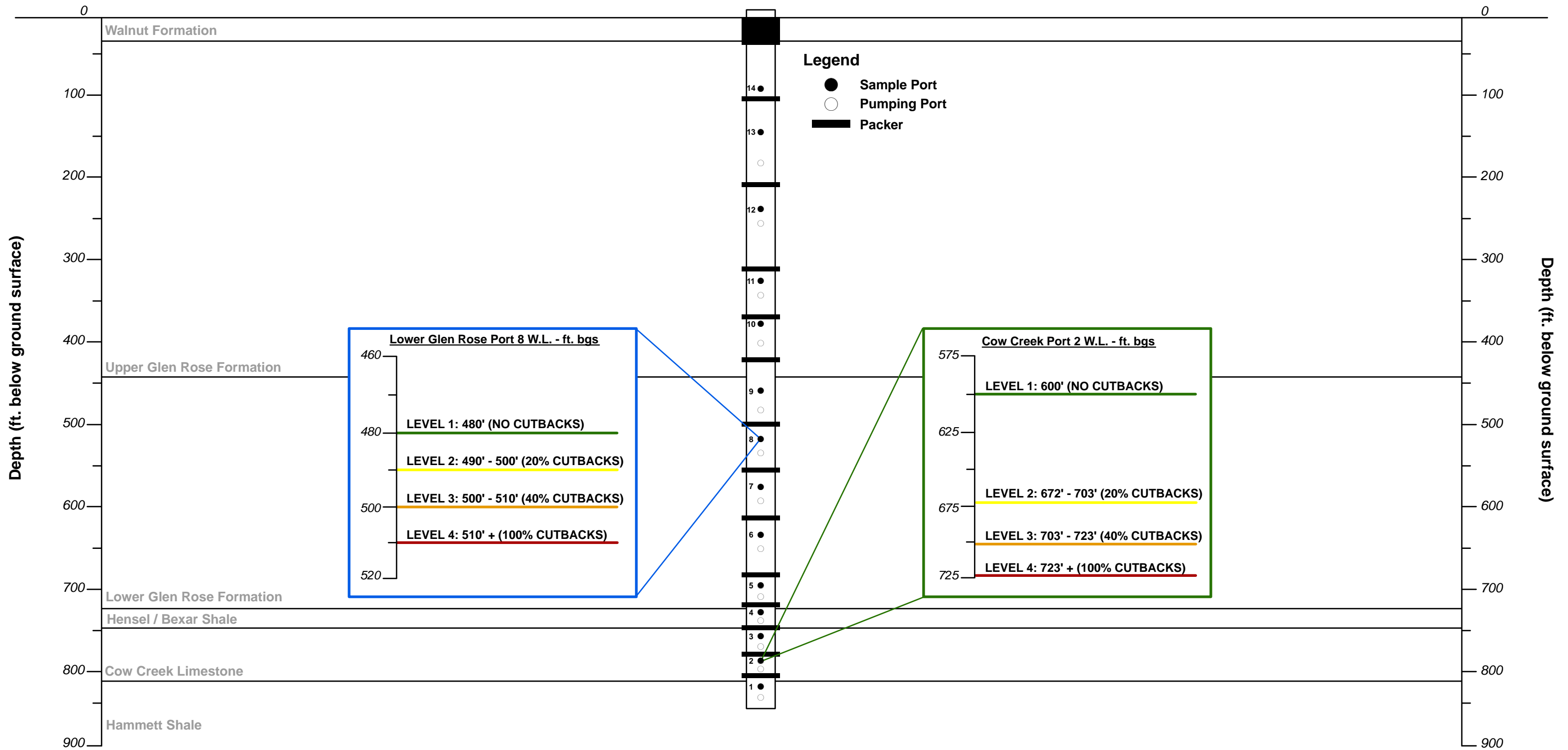
**EP Compliance Monitoring Plan Well Network (Rule 3.1.11.B)**

<p><b>Electro Purification, LLC</b></p> <p align="center">Hays County, Texas</p>	 <p><b>Wet Rock Groundwater Services, L.L.C.</b> Groundwater Specialists</p> <p>TBPG Firm No: 50038 317 Ranch Road 620 South, Ste. 203 Austin, Texas 78734 Ph: 512.773.3226 www.wetrockgs.com</p>
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## Appendix B: Index Well Cross-Section and Avoidance Measures



# Index Well (BSEACD Driftwood Westbay Well)



## EP Compliance Plan - Index Well & Proposed Avoidance Measures

<p><b>Electro Purification, LLC</b></p> <p><b>Hays County, Texas</b></p>	<p><b>Notes:</b></p> <p>1. Figure not to scale</p> <p>2. Well diagram based upon EAA geophysical log provided by BSEACD (2-17-2017)</p>		<p><b>Wet Rock Groundwater Services, L.L.C.</b>  <b>Groundwater Specialists</b></p> <p>TBPG Firm No: 50038</p> <p>317 Ranch Road 620 South, Ste. 203          Austin, Texas 78734 Ph: 512.773.3226  <a href="http://www.wetrockgs.com">www.wetrockgs.com</a></p>
<p>Drawn By: AW Date: 3-15-18</p>			

## Appendix C: Well Construction Datasheets



OCHOA WELL

Bob Ochoa well  
512.934.4771

5/03/02  
SUBMITTED

Send original copy by certified mail to: TNRCC, P.O. Box 12157, Austin, TX 78711

Please use black ink.

ATTENTION OWNER: Confidentiality  
Privilege Notice on Reverse Side

State of Texas  
WELL REPORT

Texas Water Well Drillers Advisory Council  
P.O. Box 12157  
Austin, TX 78711  
512-463-7860

1) OWNER IRWIN, GORDON ADDRESS 128 BUMBLE BEE LANE DRIFTWOOD, TX, 78619  
(Name) (Street or RFD) (City) (State) (Zip)

2) ADDRESS OF WELL:  
County HAYS 128 BUMBLE BEE LANE DRIFTWOOD, TX, 78619 GRID # 57-64-9  
(Street or RFD) (City) (State) (Zip)

3) TYPE OF WORK (Check):  
 New Well  Deepening  
 Reconditioning  Plugging

4) PROPOSED USE (Check):  Monitor  Environmental Soil Boring  Domestic  
 Industrial  Irrigation  Injection  Public Supply  De-watering  Testwell  
If Public Supply well, were plans submitted to the TNRCC?  Yes  No

5) N 30° 02.99  
W 098° 01.59

6) WELL LOG:  
Date Drilling: \_\_\_\_\_  
Started 03-27-20 02  
Completed 03-27-20 02

DIAMETER OF HOLE		
Dia. (In)	From (ft.)	To (ft.)
	Surface	
8 1/2"	0	50'
8"	50'	810'

7) DRILLING METHOD (Check):  Driven  
 Air Rotary  Mud Rotary  Bored  
 Air Hammer  Cable Tool  Jetted  
 Other \_\_\_\_\_

From (ft.)	To (ft.)	Description and color of formation material
0	1	TOP SOIL
1	30	CALICHE
30	34	BLUE LIME
34	45	TAN
45	610	GRAY
610	730	GRAY/TAN
730	770	GRAY
770	790	BROWN
790	810	GRAY

8) Borehole Completion (Check):  Open Hole  Straight Well  
 Underreamed  Gravel Packed  Other \_\_\_\_\_  
If Gravel Packed give interval ... from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

CASING, BLANK PIPE, AND WELL SCREEN DATA:

Dia (in)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft.)		Gage Casting Screen
			From	To	
8 OD	N	PVC PLASTIC	+2	810	SCH. 40

9) CEMENTING DATA [Rule 338.44(1)]  
Cemented from 0 ft. to 50 ft. No. of sacks used 6 CEMENT  
\_\_\_\_\_ ft. to \_\_\_\_\_ ft. No. of sacks used 7 VOLCLAY  
Method used PRESSURE TRIMMY CEMENTING  
Cemented by C. T. D.

Distance to septic system field lines or other concentrated contamination N/A ft.  
Method of verification of above distance WELL DRILLED FIRST

13) TYPE PUMP:  
 Turbine  Jet  Submersible  Cylinder  
 Other \_\_\_\_\_  
Depth to pump bowls, cylinder, jet, etc. \_\_\_\_\_ ft.

14) WELL TESTS:  
Type Test:  Pump  Bailor  Jetted  Estimated  
Yield: 80-60 gpm with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

15) WATER QUALITY:  
Did you knowingly penetrate any strata which contained undesirable constituents?  
 Yes  No If yes, submit "REPORT OF UNDESIRABLE WATER"  
Type of water? GLENROSE Depth of strata 40  
Was a chemical analysis made?  Yes  No

10) SURFACE COMPLETION  
 Specified Surface Slab Installed [Rule 338.44(2)(A)]  
 Specified Steel Sleeve Installed [Rule 338.44(3)(A)]  
 Pile Adapter Used [Rule 338.44(3)(b)]  
 Approved Alternative Procedure Used [Rule 338.71]

11) WATER LEVEL  
Static Level \_\_\_\_\_ ft. below land surface Date \_\_\_\_\_  
Artesian flow \_\_\_\_\_ gpm Date \_\_\_\_\_

12) PACKERS:  
Type Depth  
4 BURLAP & PLASTIC 50', 60', 690', 710'

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief. I understand that failure to complete items 1 thru 15 will result in the log(s) being returned for completion and resubmittal.

COMPANY NAME CENTRAL TEXAS DRILLING, INC. WELL DRILLER'S LICENSE NO. #4227  
(Type or print)

ADDRESS 2620 HWY. 280 WEST DRIPPING SPRINGS, TX, 78620  
(Street or RFD) (City) (State) (Zip)

(Signed) Arson Glass (Signed) \_\_\_\_\_  
(Licensed Well Driller) (Registered Driller Trainee)

Please attach electric log, chemical analysis, and other pertinent information, if available.

TNRCC-0199 (Rev. 11-1-94)  
WELL OWNER'S COPY

DRILLER'S COPY

TNRCC COPY

57-64-605



# OCHOA WELL

## TWDB Water Quality Field Data Sheet

SWN: 5764.605

Site Name: Ochoa

Project: TWDB

County: Hays

Address or Location: 126 Bubble Bee Ln.

Newly Invented Well: yes

County Code: \_\_\_\_\_

Aquifer Code: \_\_\_\_\_

ID Number: 1007

Date: 4/8/15

Aquifer Id: \_\_\_\_\_

Sampler(s): IC HR BH

BSEACD

Standard TWDB suite		Isotopes					Other
1	2	3	4	5	6	7	10
500 ml filtered	1 L unfiltered	250 ml filtered	1 L unfiltered	250 ml unfiltered	250 ml unfiltered	1 L unfiltered	
Cation	Anion	Nitrate	C:14/C:13 corr	O-18	Sr-87/Sr-86	Tritium	
HNO3 by lab	Total Alk.	Ice	NaOH by lab	Deuterium	None	2nd Enrichment	

Calibration Verification Readings	
Pre Sample	Post Sample
PH	
4 =	
7 =	
10 =	
Cond	
0 (air)	
500 =	
1,000 =	

Time In: 11:20

Time Out: \_\_\_\_\_

Water Level: 298.5

ft W.L. remark: 1.7

Pumping time: 11:33

Sampling Point: Spigot / right of pressure washer

Well Use: Dom

FIELD G.P.S. readings

Lift: 5.0

Latitude: 30° 02' 57" N

Power: elec.

Longitude: 98° 01' 36" W

Casing Type: PVC

Casing Size: 4" 5"

Sample Time: 11:52

Filtered: Yes / No (No)

Water Quality Stabilization Parameters Table (At least 3 readings @ 5 min. intervals)

Filter pressure: hand pump / line / spring (NA)

Time	11:34	11:39	11:44	11:49	11:54	11:59
Stand. pH	7.41	7.20	7.17	7.17	7.19	7.18
Celsius Temp.	22.52	26.25	26.74	26.77	26.74	26.82
mg/l D.O.	2.93	1.67	1.16	1.02	0.94	0.87
ms/cm Conductivity	1.60	1.61	1.60	1.53	1.46	1.41

Comments

Sulfur odor  
TDS: 1.04 .902  
1.04

Bob Ochoa (well owner)

Field Alkalinity Titration:		
Start pH	Sample Size	End pH
50	mL Sample Size	
	mL Acid Total (NaOH 4.5)	
	mL acid added x 20 = Alkalinity	

Total Alkalinity (38086): \_\_\_\_\_ mg/L

Items Below Calculated Later From Results:	
Dissolved Solids (mg/L):	_____
Hardness (as CaCO3):	_____
Balanced:	_____

Notes: 10 gpm  
800' well

Field Data entered into TWDB GWDB: yes / no





**ANALYTICAL RESULTS**

Workorder: Q1513192

Lab ID: **Q1513192002** Date Received: 4/8/2015 14:31 Matrix: Aqueous  
 Sample ID: **1007 OCHOA** Date Collected: 4/8/2015 12:00 Sample Type: SAMPLE  
 Project ID: **57.64.605**

Parameters	Results Units	LOD	PQL	MCL	DF	Prepared	By	Analyzed	By	Qual
<b>INORGANICS</b>										
Analysis Desc: E200.7 Metals, Trace Elements		Preparation Method: E200.7 Prep								
		Analytical Method: E200.7 Metals, Trace Elements								
Boron Dissolved	72.0 ug/L	20.0	50.0		1	04/14/15 16:11	MM	04/15/15 15:55		MV
Calcium Dissolved	158 mg/L	0.0700	0.200		1	04/14/15 16:11	MM	04/15/15 15:55		MV
Strontium Dissolved	9650 ug/L	40.0	100		10	04/14/15 16:11	MM	04/15/15 16:16		MV
Iron Dissolved	<50.0 ug/L	20.0	50.0		1	04/14/15 16:11	MM	04/15/15 15:55		MV
Magnesium Dissolved	94.0 mg/L	0.0700	0.200		1	04/14/15 16:11	MM	04/15/15 15:55		MV
Potassium Dissolved	7.78 mg/L	0.0700	0.200		1	04/14/15 16:11	MM	04/15/15 15:55		MV
Sodium Dissolved	11.1 mg/L	0.200	0.500		1	04/14/15 16:11	MM	04/15/15 15:55		MV
Analysis Desc: E200.8, ICP-MS		Preparation Method: E200.8, ICP-MS Prep								
		Analytical Method: E200.8, ICP-MS								
Aluminum Dissolved	<4.00 ug/L	1.50	4.00		1	04/14/15 16:16	MM	04/16/15 11:16		SLW
Antimony Dissolved	<1.00 ug/L	0.400	1.00		1	04/14/15 16:16	MM	04/16/15 11:16		SLW
Arsenic Dissolved	<2.00 ug/L	0.700	2.00		1	04/14/15 16:16	MM	04/16/15 11:16		SLW
Barium Dissolved	17.8 ug/L	0.400	1.00		1	04/14/15 16:16	MM	04/16/15 11:16		SLW
Beryllium Dissolved	<1.00 ug/L	0.400	1.00		1	04/14/15 16:16	MM	04/16/15 11:16		SLW
Cadmium Dissolved	<1.00 ug/L	0.400	1.00		1	04/14/15 16:16	MM	04/16/15 11:16		SLW
Chromium Dissolved	<1.00 ug/L	0.400	1.00		1	04/14/15 16:16	MM	04/16/15 11:16		SLW
Cobalt Dissolved	<1.00 ug/L	0.400	1.00		1	04/14/15 16:16	MM	04/16/15 11:16		SLW
Copper Dissolved	<1.00 ug/L	0.400	1.00		1	04/14/15 16:16	MM	04/16/15 11:16		SLW
Lithium Dissolved	24.2 ug/L	0.700	2.00		1	04/14/15 16:16	MM	04/16/15 11:16		SLW N
Lead Dissolved	<1.00 ug/L	0.400	1.00		1	04/14/15 16:16	MM	04/16/15 11:16		SLW
Manganese Dissolved	<1.00 ug/L	0.400	1.00		1	04/14/15 16:16	MM	04/16/15 11:16		SLW
Molybdenum Dissolved	1.42 ug/L	0.400	1.00		1	04/14/15 16:16	MM	04/16/15 11:16		SLW
Selenium Dissolved	<4.00 ug/L	1.50	4.00		1	04/14/15 16:16	MM	04/16/15 11:16		SLW
Silver Dissolved	<1.00 ug/L	0.400	1.00		1	04/14/15 16:16	MM	04/16/15 11:16		SLW
Thallium Dissolved	<1.00 ug/L	0.400	1.00		1	04/14/15 16:16	MM	04/16/15 11:16		SLW
Uranium Dissolved	<1.00 ug/L	0.400	1.00		1	04/14/15 16:16	MM	04/16/15 11:16		SLW N
Vanadium Dissolved	<1.00 ug/L	0.400	1.00		1	04/14/15 16:16	MM	04/16/15 11:16		SLW
Zinc Dissolved	<4.00 ug/L	1.50	4.00		1	04/14/15 16:16	MM	04/16/15 11:16		SLW



# OCHOA WELL

LCRA Environmental Laboratory Services  
 3505 Montopolis Drive  
 Austin, TX 78744  
 Phone: (512)356-6022  
 Fax: (512)356-6021

## ANALYTICAL RESULTS

Workorder: Q1513192

Lab ID:	Q1513192002	Date Received:	4/8/2015 14:31	Matrix:	Aqueous
Sample ID:	1007 OCHOA	Date Collected:	4/8/2015 12:00	Sample Type:	SAMPLE
Project ID:	57.64.605				

Parameters	Results Units	LOD	PQL	MCL	DF	Prepared	By	Analyzed	By	Qual
<b>Analysis Desc: E300.0, Anions</b>		<b>Preparation Method: E300.0, Anions</b>								
		<b>Analytical Method: E300.0, Anions</b>								
Chloride Dissolved	11.0 mg/L	2.00	5.00		5	04/14/15 20:06	ML	04/14/15 20:06	ML	
Bromide Dissolved	<0.100 mg/L	0.0400	0.100		5	04/14/15 20:06	ML	04/14/15 20:06	ML	
Fluoride Dissolved	2.50 mg/L	0.0200	0.0500		5	04/14/15 20:06	ML	04/14/15 20:06	ML	
Sulfate Dissolved	596 mg/L	4.00	10.0		10	04/17/15 14:33	ML	04/17/15 14:33	ML	
<b>TOTAL PHOSPHATE AS P</b>										
<b>Analysis Desc: E365.4 Phosphorus, Total</b>		<b>Preparation Method: E365.4 / E351.2 Water Prep</b>								
		<b>Analytical Method: E365.4 Phosphorus, Total</b>								
Phosphorus, Dissolved (As P)	<0.0200 mg/L	0.00800	0.0200		1	04/14/15 10:28	MM	04/16/15	CM	
<b>ALKALINITY</b>										
<b>Analysis Desc: SM2320B, Alkalinity</b>		<b>Preparation Method: SM2320B, Alkalinity</b>								
		<b>Analytical Method: SM2320B, Alkalinity</b>								
Phenolphthalein Alkalinity	<20.0 mg/L	20.0	20.0		1	04/15/15	HP	04/15/15	HP	N
Hydroxide Alkalinity	<20.0 mg/L	20.0	20.0		1	04/15/15	HP	04/15/15	HP	N
Bicarbonate Alkalinity	269 mg/L	20.0	20.0		1	04/15/15	HP	04/15/15	HP	N
Carbonate Alkalinity	<20.0 mg/L	20.0	20.0		1	04/15/15	HP	04/15/15	HP	N
Total Alkalinity	269 mg/L	20.0	20.0		1	04/15/15	HP	04/15/15	HP	
<b>NITRATE AND NITRITE</b>										
<b>Analysis Desc: SM4500-NO3-H, Nitrate/Nitrite</b>		<b>Preparation Method: SM4500-NO3-H, Nitrate/Nitrite</b>								
		<b>Analytical Method: SM4500-NO3-H, Nitrate/Nitrite</b>								
Nitrate/Nitrite	<0.0200 mg/L	0.00800	0.0200		1	04/20/15	ML	04/20/15	ML	
<b>SILICA</b>										
<b>Analysis Desc: SM4500-SiO2-C, Silica</b>		<b>Preparation Method: SM4500-SiO2-C, Silica</b>								
		<b>Analytical Method: SM4500-SiO2-C, Silica</b>								
Silica, Dissolved	13.5 mg/L	0.200	0.500		1	04/17/15	ML	04/17/15	ML	
<b>HEAVY METALS</b>										
<b>Analysis Desc: E245.1 Mercury Water</b>		<b>Preparation Method: E245.1 Mercury Water</b>								
		<b>Analytical Method: E245.1 Mercury Water</b>								
Mercury Dissolved	<0.200 ug/L	0.0700	0.200		1	04/15/15	FM	04/16/15 10:53	FM	

Report ID: 150258 - 1664387

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57.64.605



# OCHOA WELL

LCRA Environmental Laboratory Services  
 3505 Montopolis Drive  
 Austin, TX 78744  
 Phone: (512)356-6022  
 Fax: (512)356-6021

## ANALYTICAL RESULTS

Workorder: Q1513192

Lab ID: **Q1513192002** Date Received: 4/8/2015 14:31 Matrix: Aqueous  
 Sample ID: **1007 OCHOA** Date Collected: 4/8/2015 12:00 Sample Type: SAMPLE  
 Project ID: **57.64.605**

Parameters	Results Units	LOD	PQL	MCL	DF	Prepared	By	Analyzed	By	Qual
<b>INORGANICS</b>										
Analysis Desc: SM1030B Cation/Anion Balance		Preparation Method: SM1030B Cation/Anion Balance								
		Analytical Method: SM1030B Cation/Anion Balance								
Cation/Anion Balance	4.910 %				1	04/21/15 07:26	CW	04/21/15 07:26	CW	

57.64.605



# OCHOA WELL



OldkyleRd

LoneManMountainRd

Bumblebeelen

RollingOaksDr

RollingOaksDr

183

3237

370

374

1996

© 2015 Google

Imagery Date: 1/18/2015

30°02'53.83" N 98°01'52.89" W elev 1129 ft eye alt 3953 ft

# Google earth



# OCHOA WELL



## ANALYSIS REPORT

Lab #: 503972 Job #: 28735 IS-64056 Co. Job#:  
Sample Name: Q1513194002 Co. Lab#:  
Company: LCRA Environmental Lab Services  
API/Well:  
Container: 250ml Plastic Bottle  
Field/Site Name: 45127860 - HBN 28785  
Location:  
Formation/Depth:  
Sampling Point:  
Date Sampled: 4/08/2015 12:00 Date Received: 4/17/2015 Date Reported: 4/24/2015

$\delta D$  of water ----- -26.8 ‰ relative to VSMOW  
 $\delta^{18}O$  of water ----- -4.41 ‰ relative to VSMOW  
Tritium content of water ----- na  
 $\delta^{13}C$  of DIC ----- na  
 $^{14}C$  content of DIC ----- na  
 $\delta^{15}N$  of nitrate ----- na  
 $\delta^{18}O$  of nitrate ----- na  
 $\delta^{34}S$  of sulfate ----- na  
 $\delta^{18}O$  of sulfate ----- na

Remarks:

57.64.605

# OCHOA WELL

Client: LCRA ENVIRONMENTAL LAB SERVICES  
Recvd : 15/04/21  
Job# : 3275  
Final : 15/05/28

Purchase Order#: Q1513196  
Contact: Dale Jurecka 512-356-6022  
3505 Montopolis Dr.  
Austin, TX 78744

Cust	LABEL INFO	JOB.SX	REFDATE	QUANT	ELYS	TU	eTU
LCRA -	Q1513196001	3275.01	150408	1000	275	0.06	0.09
LCRA -	Q1513196002	3275.02	150408	1000	275	0.27*	0.09
LCRA -	Q1513196003	3275.03	150408	1000	275	1.47	0.09
LCRA -	Q1513196004	3275.04	150408	1000	275	0.02	0.09

57.64.605

\* Average of duplicate runs

# WOOD 01 WELL

## STATE OF TEXAS WELL REPORT for Tracking #233129

Owner:	<b>DONALD WOOD/MIKE ENDRES JOB</b>	Owner Well #:	<b>No Data</b>
Address:	<b>500 DEER LAKE RD. WIMBERLEY, TX 78676</b>	Grid #:	<b>57-64-9</b>
Well Location:	<b>BRYARWOOD RANCH WIMBERLEY, TX 78676</b>	Latitude:	<b>30° 02' 24" N</b>
Well County:	<b>Hays</b>	Longitude:	<b>098° 02' 00" W</b>
		Elevation:	<b>No Data</b>
Type of Work:	<b>New Well</b>	Proposed Use:	<b>Domestic</b>

Drilling Start Date: **10/8/2010**      Drilling End Date: **10/8/2010**

	<i>Diameter (in.)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Borehole:	<b>9</b>	<b>0</b>	<b>50</b>
	<b>6.5</b>	<b>50</b>	<b>790</b>

Drilling Method: **Air Rotary**

Borehole Completion: **CASED**

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Description (number of sacks &amp; material)</i>
Annular Seal Data:	<b>0</b>	<b>50</b>	<b>5 VOLCLAY</b>
	<b>0</b>	<b>50</b>	<b>7 CEMENT</b>

Seal Method: **Slurry**

Sealed By: **Driller**

Distance to Property Line (ft.): **N/A**

Distance to Septic Field or other  
concentrated contamination (ft.): **N/A**

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

Method of Verification: **WELL DRILLED  
FIRST**

Surface Completion: **Surface Sleeve Installed**

Water Level: **No Data**

Packers: **4 BURLAP,PVC,RUBBER 50',550',570',670'**

Type of Pump: **Submersible**

Well Tests: **Jetted**      **Yield: 100+ GPM**

# WOOD 01 WELL

Water Quality:	<i>Strata Depth (ft.)</i>	<i>Water Type</i>
	<b>80</b>	<b>MIDDLE TRINITY</b>

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: **CENTEX PUMP & SUPPLY, INC.**  
**2520 HWY. 290 WEST**  
**DRIPPING SPRINGS, TX 78620**

Driller Name: **AARON GLASS** License Number: **4227**

Comments: **No Data**

Lithology:  
DESCRIPTION & COLOR OF FORMATION MATERIAL

Casing:  
BLANK PIPE & WELL SCREEN DATA

<i>Top (ft.)</i>	<i>Bottom (ft.)</i>	<i>Description</i>
<b>0</b>	<b>1</b>	<b>TOP SOIL</b>
<b>1</b>	<b>30</b>	<b>CALICHE</b>
<b>30</b>	<b>32</b>	<b>BLUE LIMESTONE</b>
<b>32</b>	<b>210</b>	<b>GRAY LIMESTONE</b>
<b>210</b>	<b>350</b>	<b>GRAY/TAN LIMESTONE</b>
<b>350</b>	<b>490</b>	<b>TAN/GRAY LIMESTONE</b>
<b>490</b>	<b>500</b>	<b>WHITE/GRAY LIMESTONE</b>
<b>500</b>	<b>540</b>	<b>GRAY LIMESTONE</b>
<b>540</b>	<b>570</b>	<b>GRAY W/TAN LIMESTONE</b>
<b>570</b>	<b>700</b>	<b>TAN LIMESTONE</b>
<b>700</b>	<b>760</b>	<b>GRAY/TAN LIMESTONE</b>
<b>760</b>	<b>790</b>	<b>BROWN LIMESTONE</b>

<i>Dia. (in.)</i>	<i>New/Used</i>	<i>Type</i>	<i>Setting From/To (ft.)</i>
<b>5"</b>	<b>N</b>	<b>SDR17 PVC +3</b>	<b>TO 790</b>
<b>5"</b>	<b>N</b>	<b>SDR17 PVC SLOT</b>	<b>710 TO 790 .032</b>



**IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY**

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

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

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



# BOWMAN WELL

Water Quality:	<i>Strata Depth (ft.)</i>	<i>Water Type</i>
	<b>830-850</b>	<b>glen rose cow creek</b>

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: **Associated Drilling Inc.**  
**PO Box 673**  
**Dripping Springs, TX 78620**

Driller Name: **James Benoit** License Number: **4064**

Comments: **Joelander Well Drilling**  
**Exempt permit**

Lithology:  
DESCRIPTION & COLOR OF FORMATION MATERIAL

Casing:  
BLANK PIPE & WELL SCREEN DATA

<i>Top (ft.)</i>	<i>Bottom (ft.)</i>	<i>Description</i>
<b>0</b>	<b>55</b>	<b>tan and white limestone</b>
<b>55</b>	<b>60</b>	<b>red clay</b>
<b>60</b>	<b>90</b>	<b>tan limestone</b>
<b>90</b>	<b>110</b>	<b>tan lime</b>
<b>110</b>	<b>675</b>	<b>gray lime</b>
<b>675</b>	<b>765</b>	<b>tan limestone</b>
<b>765</b>	<b>830</b>	<b>gray lime</b>
<b>830</b>	<b>850</b>	<b>brown and tan limestone</b>

<i>Dia. (in.)</i>	<i>New/Used</i>	<i>Type</i>	<i>Setting From/To (ft.)</i>
<b>5 od</b>	<b>new</b>	<b>sdr17 pvc</b>	<b>-3 to 810</b>
<b>5 od</b>	<b>new</b>	<b>sdr17 pvc (.032) screen</b>	<b>810 to 850</b>

## 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**

**LOWE WELL**

**STATE OF TEXAS WELL REPORT for Tracking #394760**

Owner: <b>Loyal Lowe</b>	Owner Well #: <b>No Data</b>
Address: <b>132 N. Ocean Dr. Port Lavaca, TX 77979</b>	Grid #: <b>57-64-6</b>
Well Location: <b>891 Jennifer Lane Driftwood, TX 78619</b>	Latitude: <b>30° 03' 17" N</b>
Well County: <b>Hays</b>	Longitude: <b>098° 01' 41" W</b>
	Elevation: <b>1114 ft. above sea level</b>
<hr/>	
Type of Work: <b>New Well</b>	Proposed Use: <b>Domestic</b>

Drilling Start Date: **4/14/2015**      Drilling End Date: **5/6/2015**

	Diameter (in.)	Top Depth (ft.)	Bottom Depth (ft.)
Borehole:	<b>7.875</b>	<b>0</b>	<b>860</b>

Drilling Method: **Air Rotary**

Borehole Completion: **Straight Wall**

	Top Depth (ft.)	Bottom Depth (ft.)	Description (number of sacks & material)
Annular Seal Data:	<b>90</b>	<b>285</b>	<b>12 Bentonite</b>
	<b>285</b>	<b>495</b>	<b>47 Cement</b>
	<b>495</b>	<b>510</b>	<b>1 bentonite</b>

Seal Method: **Pos. Displacement**

Sealed By: **Driller**

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

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

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

Method of Verification: **Measured**

Surface Completion: **Surface Sleeve Installed**

Water Level: **275 ft. below land surface on 2015-04-16**      Measurement Method: **Unknown**

Packers: **Shale/6Mil Poly 510  
Shale/6Mil Poly 515  
Shale/6Mil Poly 520  
Shale/6Mil Poly 720  
Shale/6Mil Poly 730  
Shale/6Mil Poly 740**

Type of Pump: **Submersible**      Pump Depth (ft.): **760**

Well Tests: **Jetted**      Yield: **50 GPM**

# LOWE WELL

Water Quality:

<i>Strata Depth (ft.)</i>	<i>Water Type</i>
<b>740/800</b>	<b>Good</b>

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: **Whisenant & Lyle Water Services**

**PO Box 525  
Dripping Springs, TX 78620**

Driller Name: **Brice Bormann**

License Number: **54855**

Apprentice Name: **Tyler Loman**

Comments: **additional Annular Seal data:  
90' to 0 21 bags cement**

Lithology:  
DESCRIPTION & COLOR OF FORMATION MATERIAL

Casing:  
BLANK PIPE & WELL SCREEN DATA

<i>Top (ft.)</i>	<i>Bottom (ft.)</i>	<i>Description</i>
<b>0</b>	<b>3</b>	<b>Topsoil</b>
<b>3</b>	<b>25</b>	<b>Tan limestone</b>
<b>25</b>	<b>28</b>	<b>Brown limestone</b>
<b>28</b>	<b>32</b>	<b>Caliche</b>
<b>32</b>	<b>82</b>	<b>Tan limestone</b>
<b>82</b>	<b>95</b>	<b>Shale</b>
<b>95</b>	<b>455</b>	<b>Brown tan limestone</b>
<b>455</b>	<b>587</b>	<b>Brown limestone</b>
<b>587</b>	<b>692</b>	<b>Dark brown limestone</b>
<b>692</b>	<b>790</b>	<b>Brown tan limestone</b>
<b>790</b>	<b>838</b>	<b>Dark brown limestone</b>
<b>838</b>	<b>860</b>	<b>Hamett clay</b>

<i>Dia. (in.)</i>	<i>New/Used</i>	<i>Type</i>	<i>Setting From/To (ft.)</i>
<b>4.5</b>	<b>New</b>	<b>PVC SDR 17 Solid</b>	<b>0-760</b>
<b>4.5</b>	<b>New</b>	<b>PVC SDR 17 Slotted</b>	<b>760-820 .032</b>
<b>4.5</b>	<b>New</b>	<b>PVC SDR 17 Solid</b>	<b>820-840</b>

**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**

**ESCONDIDA 01 WELL**

**STATE OF TEXAS WELL REPORT for Tracking #435981**

Owner:	<b>Amy and Michael Gomez</b>	Owner Well #:	<b>1</b>
Address:	<b>PO Box 2531 Wimberley, TX 78676</b>	Grid #:	<b>57-64-9</b>
Well Location:	<b>5000 FM 3237 Wimberley, TX 78676</b>	Latitude:	<b>30° 01' 44.15" N</b>
Well County:	<b>Hays</b>	Longitude:	<b>098° 02' 26.84" W</b>
		Elevation:	<b>1069 ft. above sea level</b>

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Type of Work:	<b>New Well</b>	Proposed Use:	<b>Domestic</b>
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Drilling Start Date: **10/13/2016**      Drilling End Date: **10/19/2016**

	<i>Diameter (in.)</i>	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>
Borehole:	<b>10</b>	<b>0</b>	<b>930</b>

Drilling Method: **Air Rotary**

Borehole Completion: **Open Hole**

	<i>Top Depth (ft.)</i>	<i>Bottom Depth (ft.)</i>	<i>Description (number of sacks &amp; material)</i>
Annular Seal Data:	<b>0</b>	<b>120</b>	<b>Cement &amp; Sand Mix 10 Bags/Sacks</b>
	<b>120</b>	<b>850</b>	<b>Cement 215 Bags/Sacks</b>
	<b>850</b>	<b>870</b>	<b>Cement &amp; Sand Mix 5 Bags/Sacks</b>

Seal Method: **Pressure**

Sealed By: **Driller**

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

Distance to Septic Field or other concentrated contamination (ft.): **150**

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

Method of Verification: **measured**

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

Water Level: **315 ft. below land surface on 2016-10-19**

Packers: **Rubber at 870 ft.  
screen at 870 ft.**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

# ESCONDIDA 01 WELL

Water Quality:	<i>Strata Depth (ft.)</i>	<i>Water Type</i>
	<b>No Data</b>	<b>No Data</b>

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: **Kutscher Drilling**  
**3810 Hunter Road**  
**San Marcos, TX 78666**

Driller Name: **Daniel Kutscher** License Number: **54746**

Comments: **No Data**

**Report Amended on 7/5/2017 by Request #21909**

Lithology:  
DESCRIPTION & COLOR OF FORMATION MATERIAL

Casing:  
BLANK PIPE & WELL SCREEN DATA

<i>Top (ft.)</i>	<i>Bottom (ft.)</i>	<i>Description</i>
<b>0</b>	<b>930</b>	<b>cement and casing</b>

<i>Dia (in.)</i>	<i>Type</i>	<i>Material</i>	<i>Sch./Gage</i>	<i>Top (ft.)</i>	<i>Bottom (ft.)</i>
<b>5</b>	<b>Blank</b>	<b>Plastic (PVC)</b>	<b>SDR-17</b>	<b>-3</b>	<b>877</b>

## 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**



# Odell Well No. 1

## STATE OF TEXAS WELL REPORT for Tracking #388355

Owner:	Electro Purification, LLC	Owner Well #:	Odell TW#1
Address:	4605 Post Oak Place Dr Houston, TX 77027	Grid #:	57-64-6
Well Location:	5801 Old Kyle Rd Wimberley, TX 78676	Latitude:	30° 02' 33" N
Well County:	Hays	Longitude:	098° 01' 21" W
		Elevation:	1063 ft. above sea level

Type of Work: <b>New Well</b>	Proposed Use: <b>Test Well</b>
-------------------------------	--------------------------------

Drilling Start Date: **1/12/2015**      Drilling End Date: **1/20/2015**

	Diameter (in.)	Top Depth (ft.)	Bottom Depth (ft.)
Borehole:	14.75	0	565
	9.875	0	903

Drilling Method: **Air Rotary**

Borehole Completion: **Straight Wall**

	Top Depth (ft.)	Bottom Depth (ft.)	Description (number of sacks & material)
Annular Seal Data:	0	10	2 benseal
	553	565	7 Type H

Seal Method: **Pos Displacement**

Sealed By: **Driller**

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

Distance to Septic Field or other concentrated contamination (ft.): **N/A**

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

Method of Verification: **measured**

Surface Completion: **Alternative Procedure Used**

Water Level: **330 ft. below land surface on 2015-01-13**      Measurement Method: **Unknown**

Packers: **Shale packer 560'**  
**6Mil poly 565'**

Type of Pump: **No Data**

Well Tests: **Jetted**      **Yield: 75 GPM**

	Description (number of sacks & material)	Top Depth (ft.)	Bottom Depth (ft.)
Plug Information:	<b>Cement</b>	<b>742</b>	<b>903</b>

# ODELL NO. 1

Water Quality:	<i>Strata Depth (ft.)</i>	<i>Water Type</i>
	<b>800-860</b>	<b>Good TDS 300</b>

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:** Whisenant & Lyle Water Services  
PO Box 525  
Dripping Springs, TX 78620

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

**Comments:** Other driller  
Martin Lingle  
  
Apprentices  
Walker Dodson  
Justin Nance

**Report Amended on 3/16/2017 by Request #20977**

**Lithology:**  
**DESCRIPTION & COLOR OF FORMATION MATERIAL**

<i>Top (ft.)</i>	<i>Bottom (ft.)</i>	<i>Description</i>
0	10	white limestone
10	17	brown limestone
17	80	gray limestone
80	85	brown limestone
85	280	gray limestone
280	885	gray tan limestone
885	900	shale gray limestone
900	903	shale

**Casing:**  
**BLANK PIPE & WELL SCREEN DATA**

<i>Dia. (in.)</i>	<i>New/Used</i>	<i>Type</i>	<i>Setting From/To (ft.)</i>
<b>10" New PVC-SDR 17IB 0-565</b>			

## ODELL NO. 1

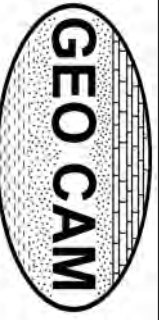
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### **IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY**

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**Texas Department of Licensing and Regulation  
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Austin, TX 78711  
(512) 334-5540**



**Water Well Logging & Video Recording Services**

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

**Borehole: TELEPHONE COMPANY TEST WELL**

**Logs: GAMMA, RESISTIVITY, SPR, CALIPER**

**Project: TELEPHONE COMPANY TEST WELL** Date: 01-13-2014

**Client: WHISENANT & LYLE** County: HAYS

**Location: N 30° 2' 55.55" W 98° 1' 45.43"** State: TX

BOREHOLE DATA

**Drilling Contractor: WHISENANT & LYLE** **Driller T.D. (ft) : 906**

**Elevation: 1102' GPS.** **Logger T.D. (ft) : 906.2**

**Depth Ref: G.L.** **Date Drilled: 01-13-2014**

BIT RECORD			CASING RECORD			
RUN	BIT SIZE (in)	FROM (ft)	TO (ft)	SIZE/WGT/THK	FROM (ft)	TO (ft)
1	9 7/8	0	906	NA		
2						
3						

**Drill Method: AIR ROTARY** **Weight: NA** **Fluid Level (ft) : 329**

**Hole Medium: NA** **Mud Type: NA** **Time Since Circ: NA**

**Viscosity: NA** **Rm: at: Deg C**

GENERAL DATA

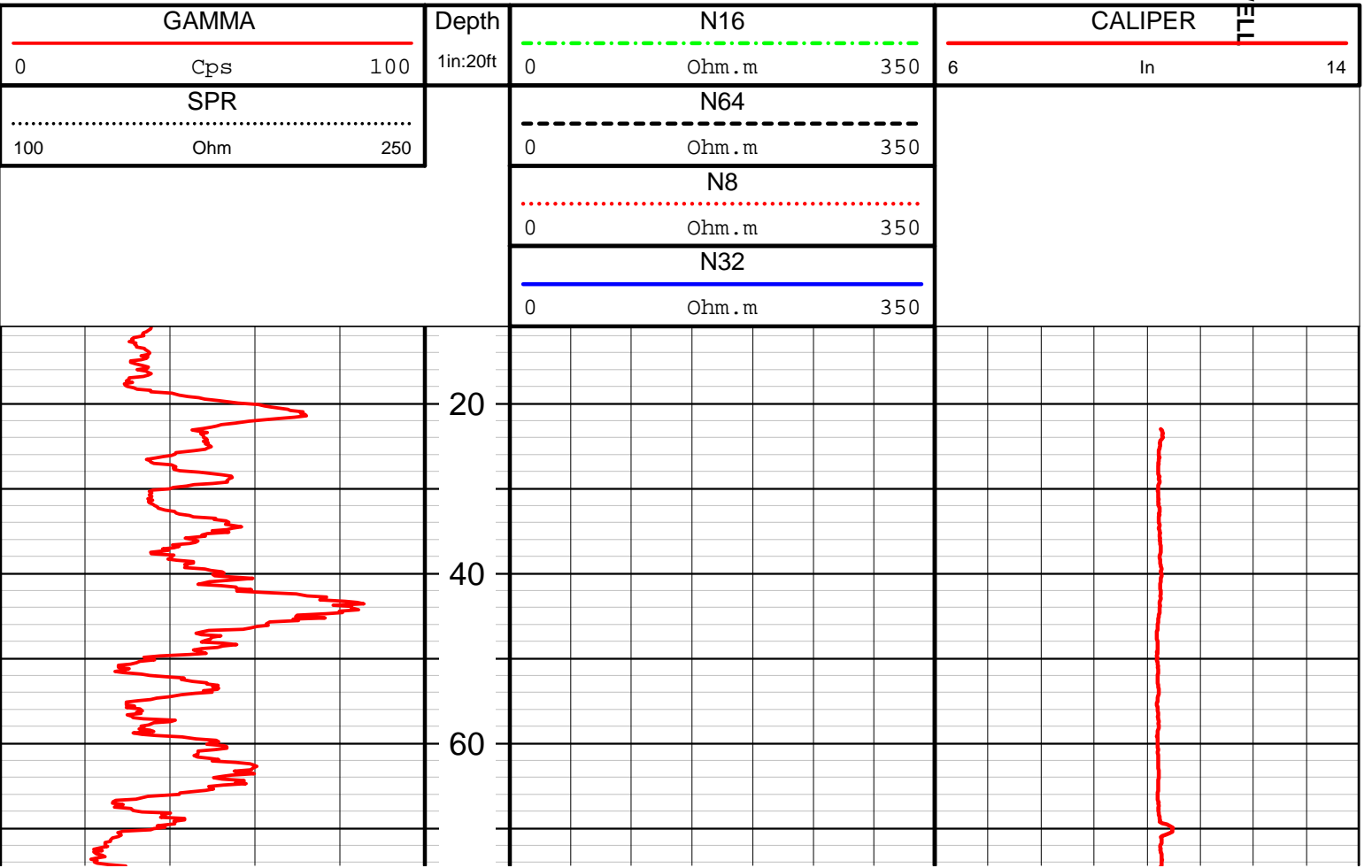
**Logged by: ERASMO DE LA FUENTE** **Unit/Truck: 10**

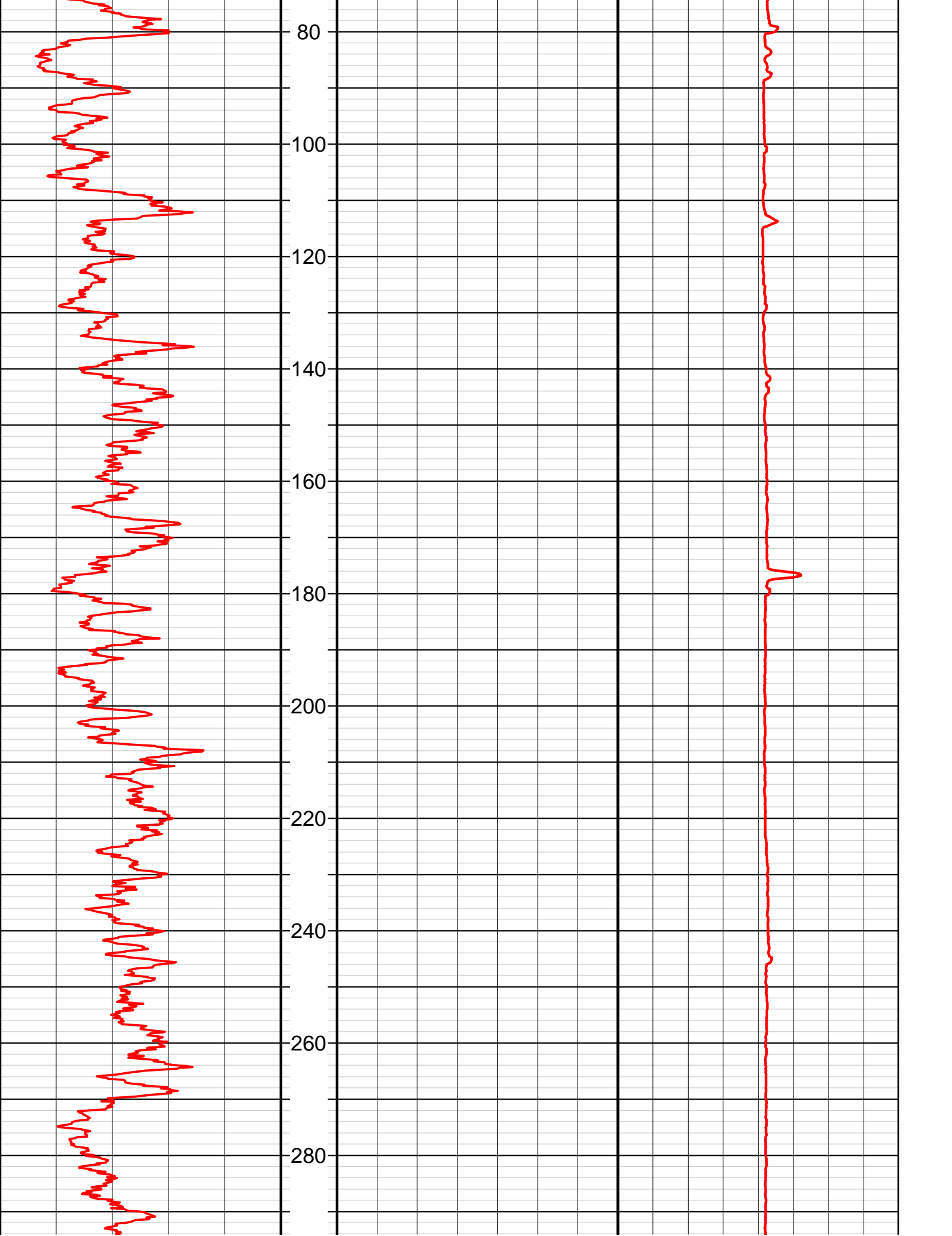
**Witness: MARTIN - ANDREW**

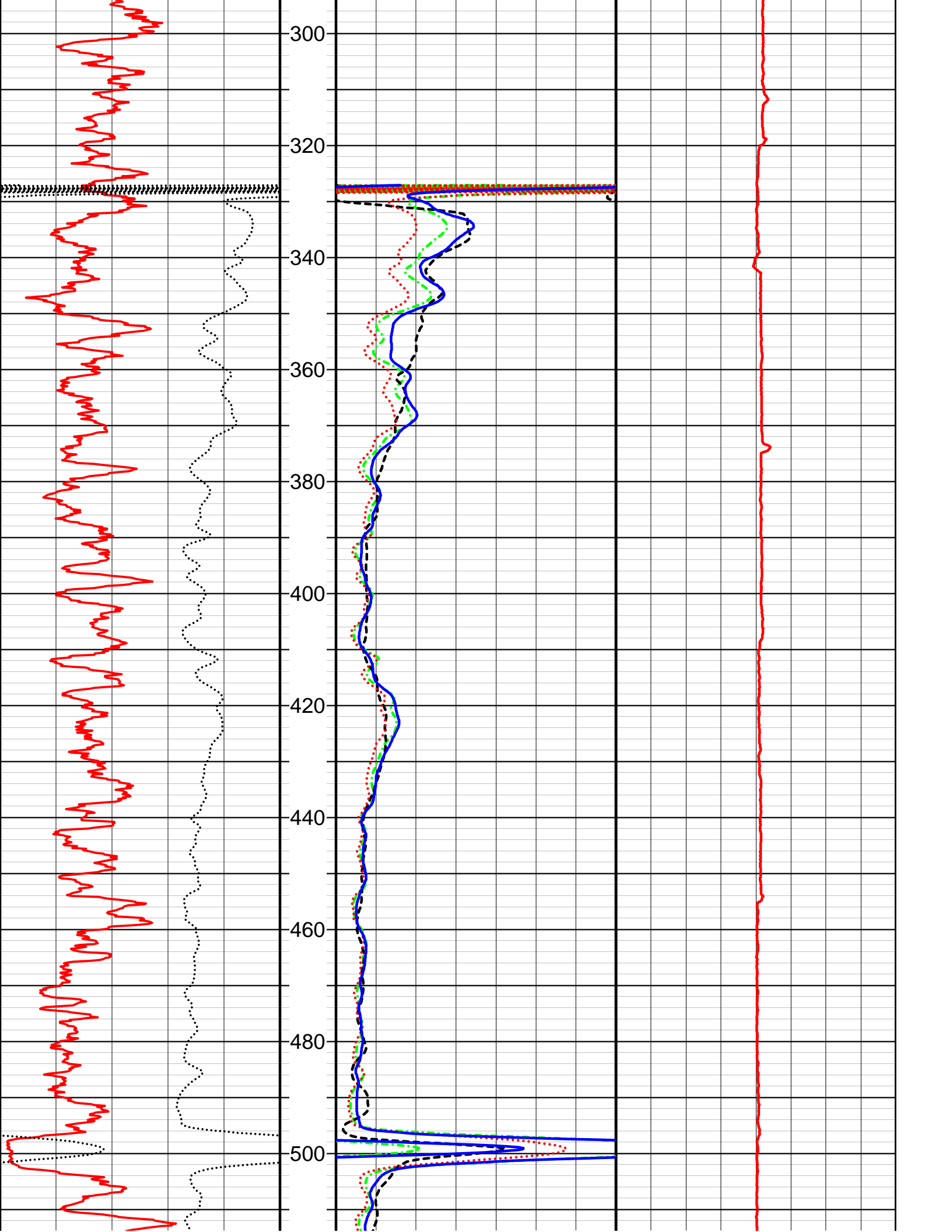
LOG TYPE	RUN NO	SPEED (ft/min)	FROM (ft)	TO (ft)	FT./IN.
GAMMA	2	40	892.4	11	20
RESISTIVITY, SPR.	2	40	899	327.1	20
CALIPER	2	40	904.4	23	20

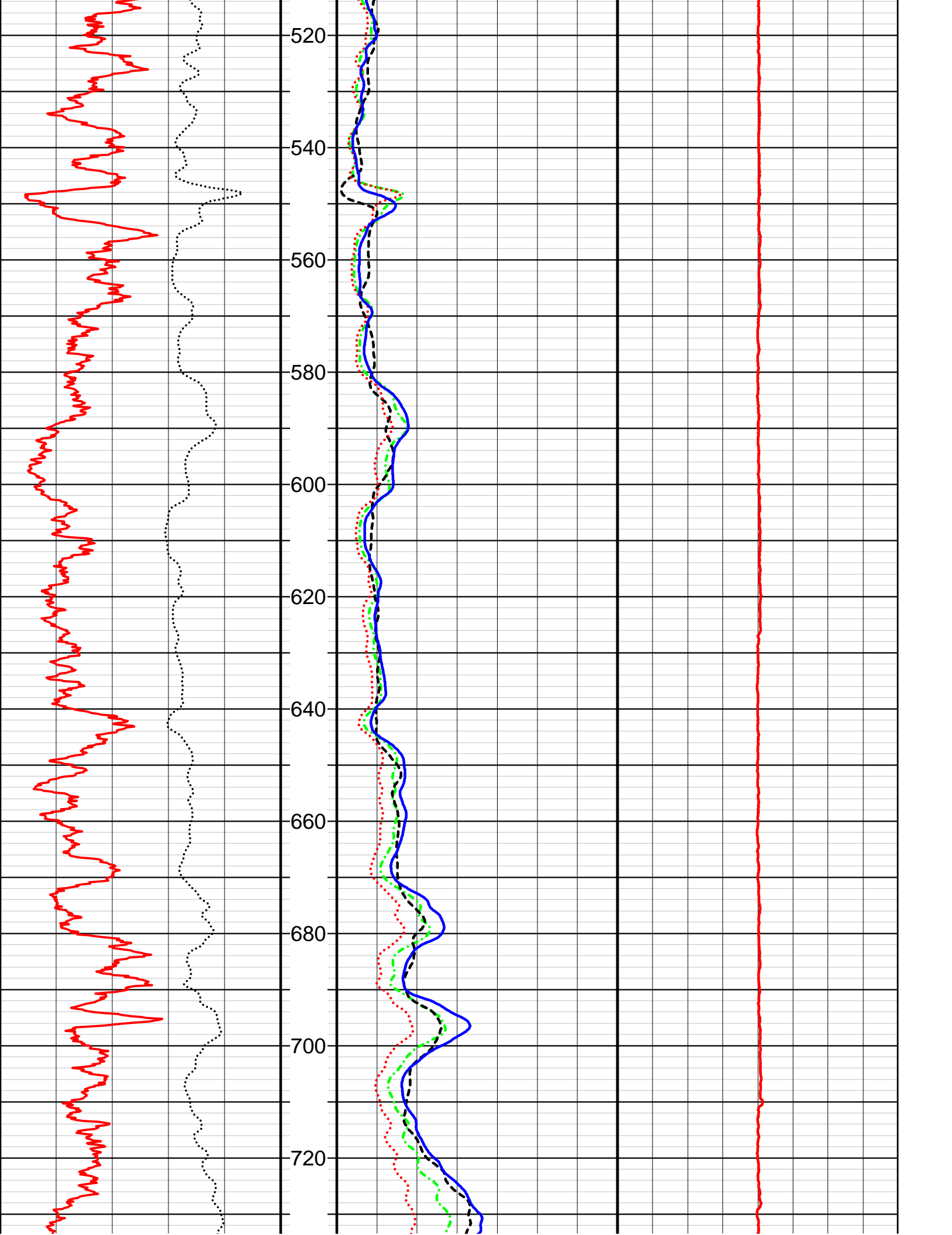
**Comments:**

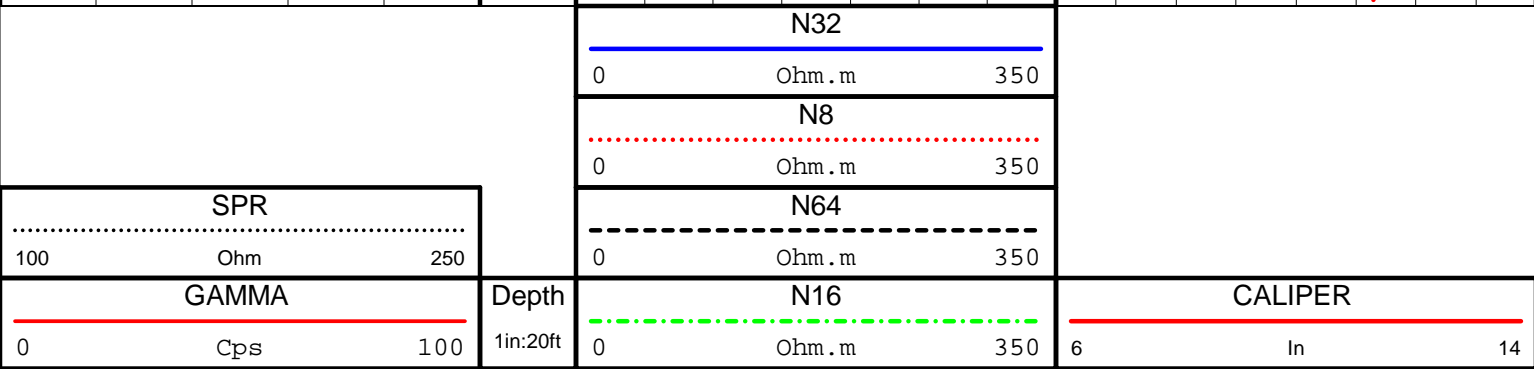
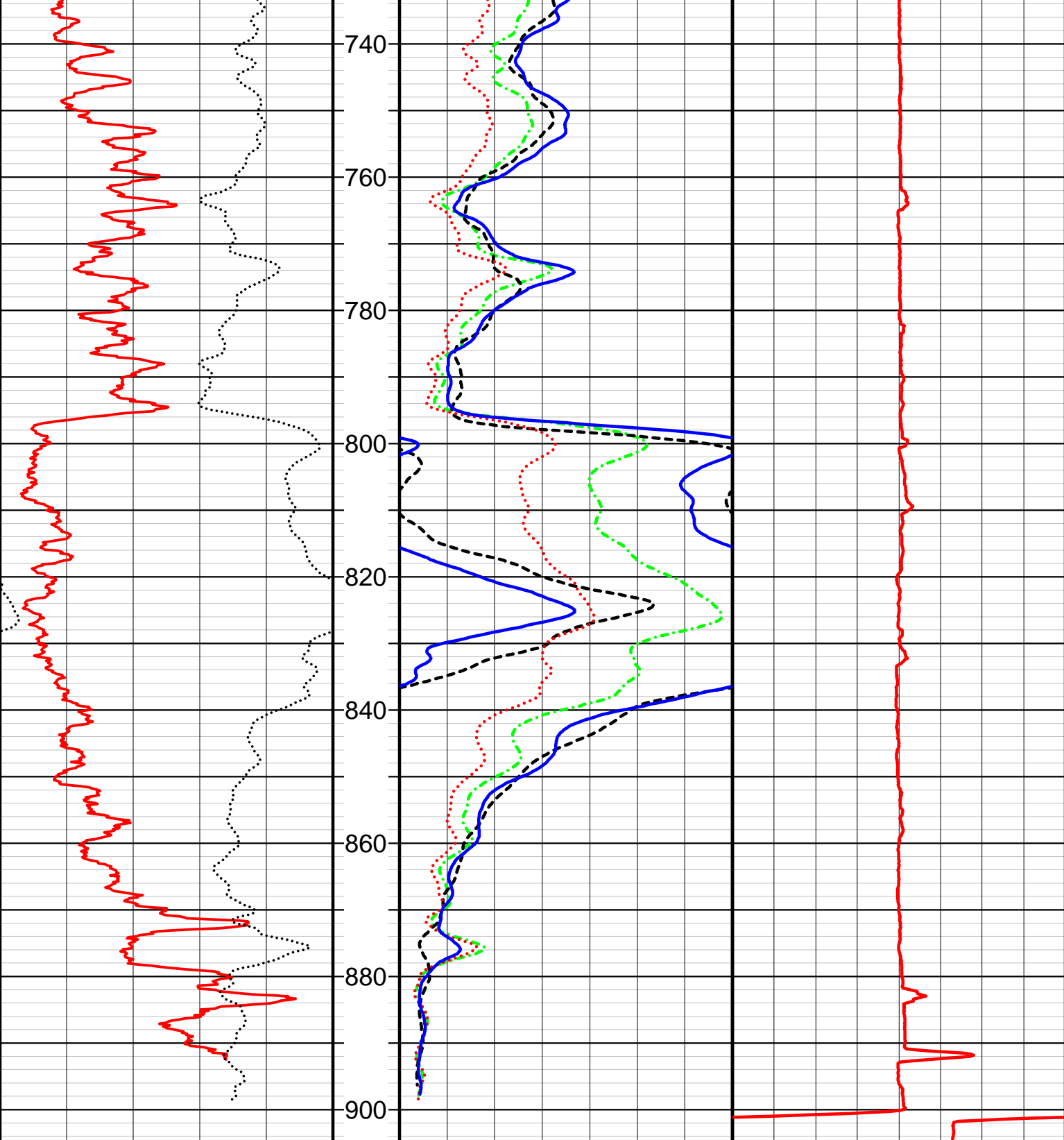
**Odell Test Well No. 1**











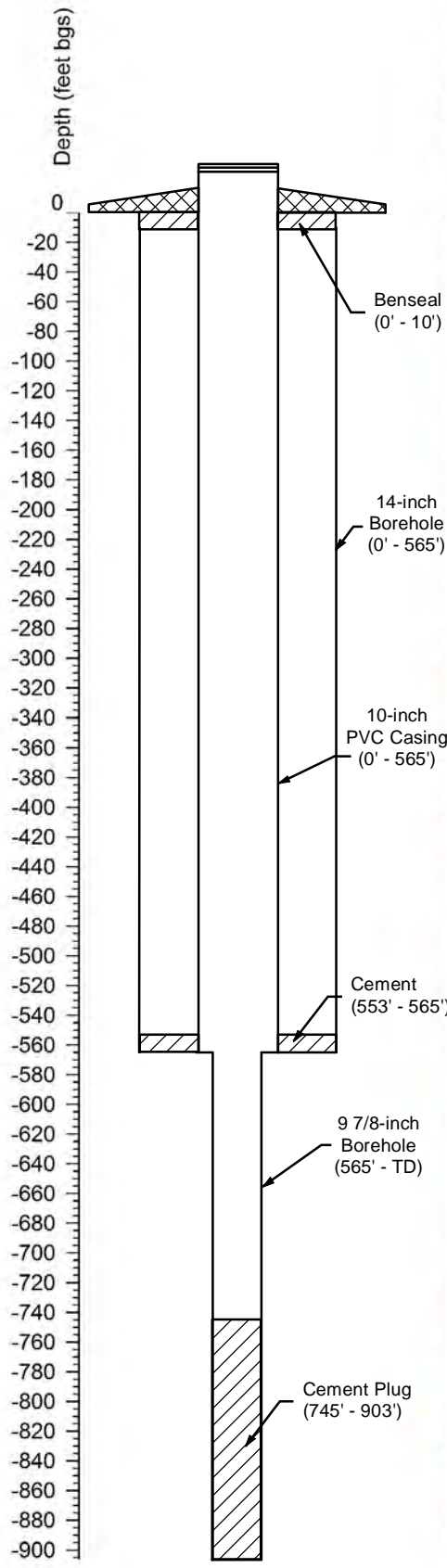


## Appendix D: Monitor Well Profiles

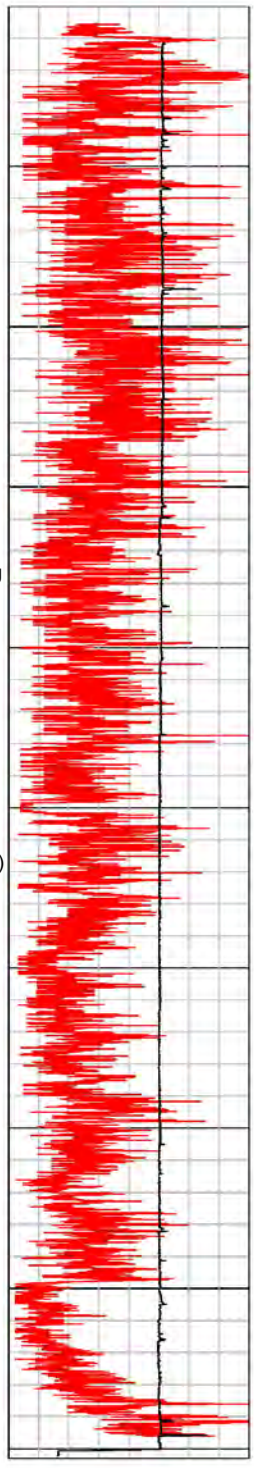


Client: Electro Purification LLC	Location: Hays County, Texas	Drilled by: Whisenant & Lyle Water Services	Construction Date: 1/20/2015
Elevation: 1,102 ft. MSL	Total Depth: 903 ft.	Latitude: 30° 2' 55.55" N	Longitude: 98° 1' 45.43" W

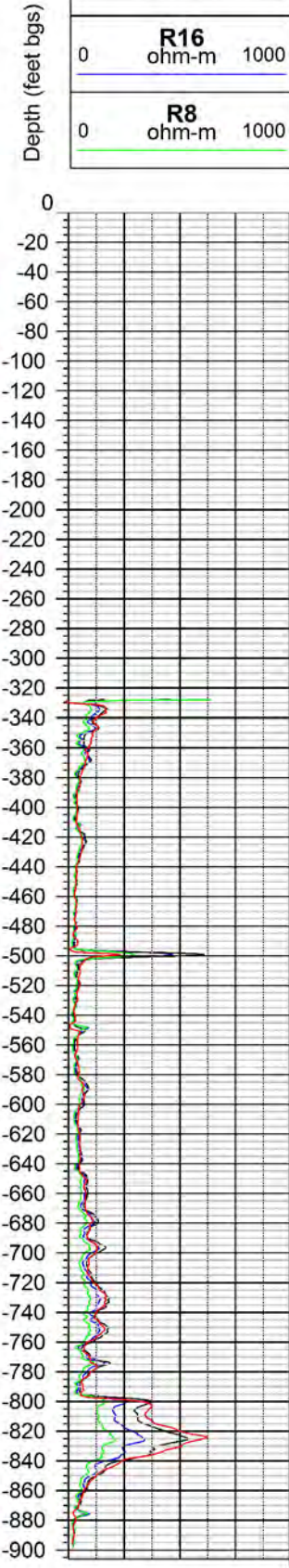
# Well ID: Odell Test Well No. 1



0.0	<b>Caliper</b>	16.0
0	<b>Gamma Ray</b> API	100

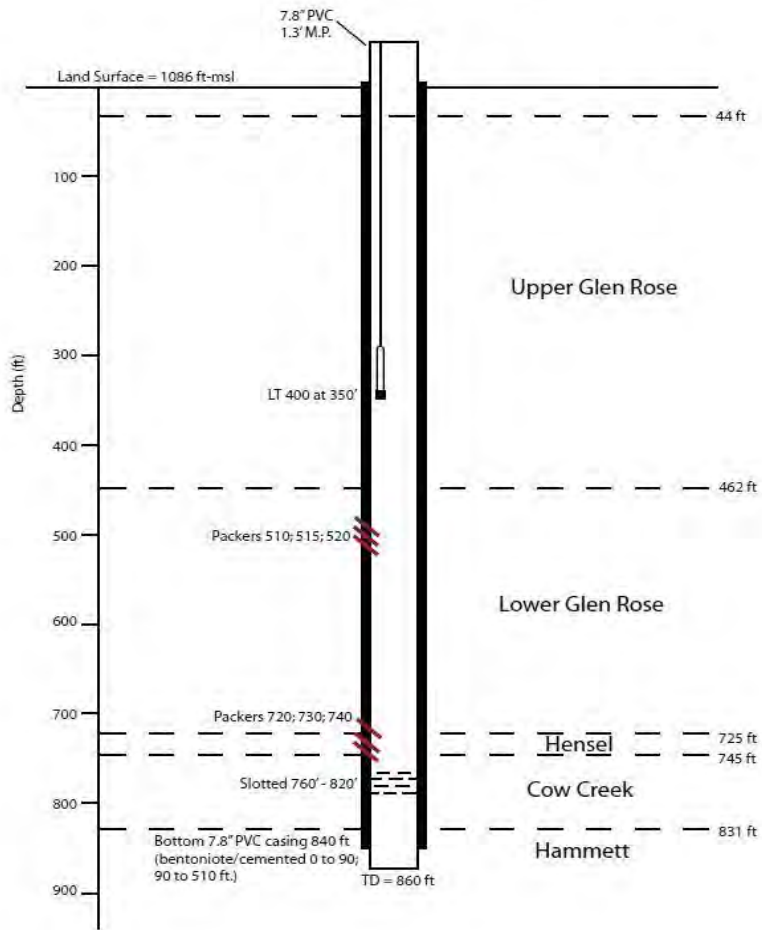


0	<b>R64</b>	1000
0	<b>R32</b>	1000
0	<b>R16</b>	1000
0	<b>R8</b>	1000



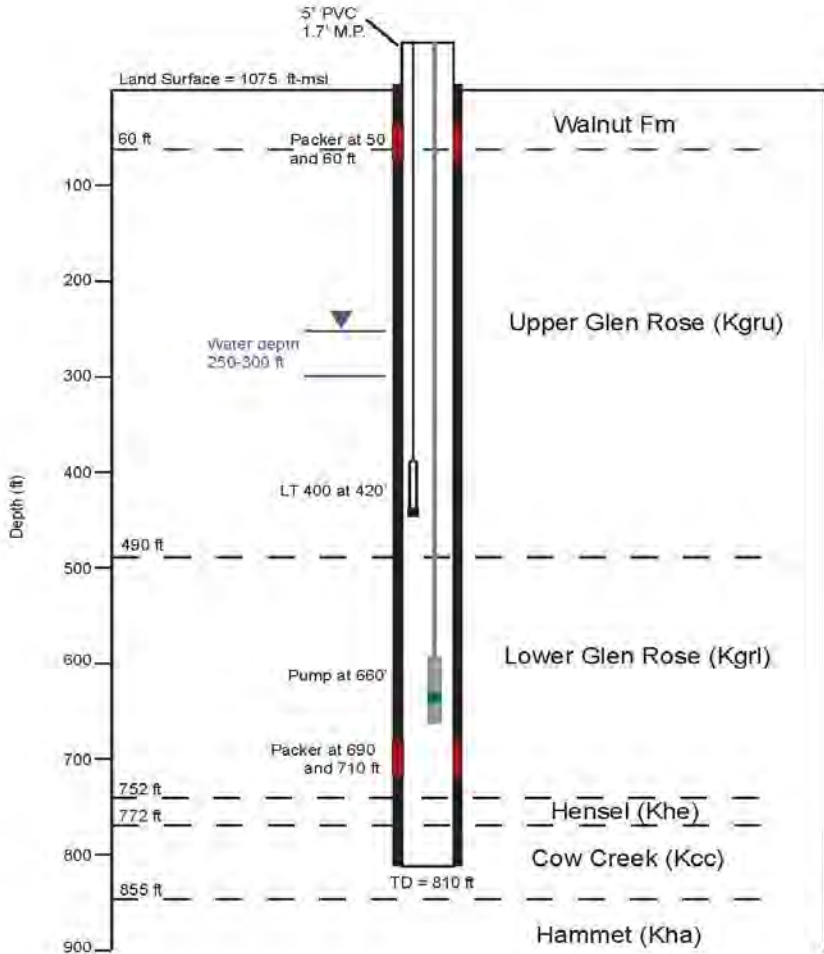
Geology	Aquifer
Edwards Group (0' - 80')	Edwards Aquifer (0' - 80')
Upper Glen Rose Limestone (80' - 516')	Upper Trinity Aquifer (80' - 516')
Lower Glen Rose Limestone (516' - 752')	Middle Trinity Aquifer (554' - 883')
Bexar Shale (752' - 798')	
Cow Creek Limestone (798' - 883')	
Hammett Clay (883' - TD)	

# Low Monitor well



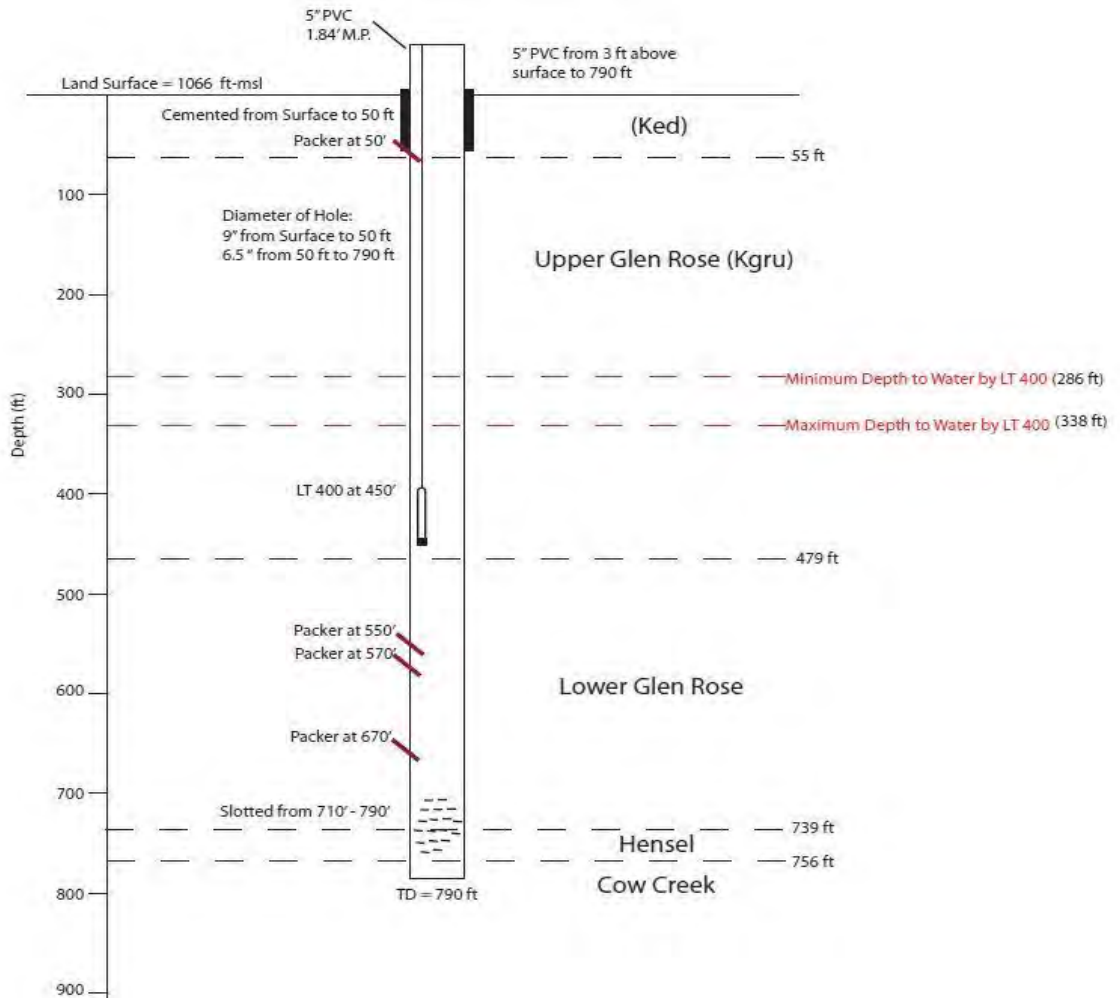
Pump Depth= 760'

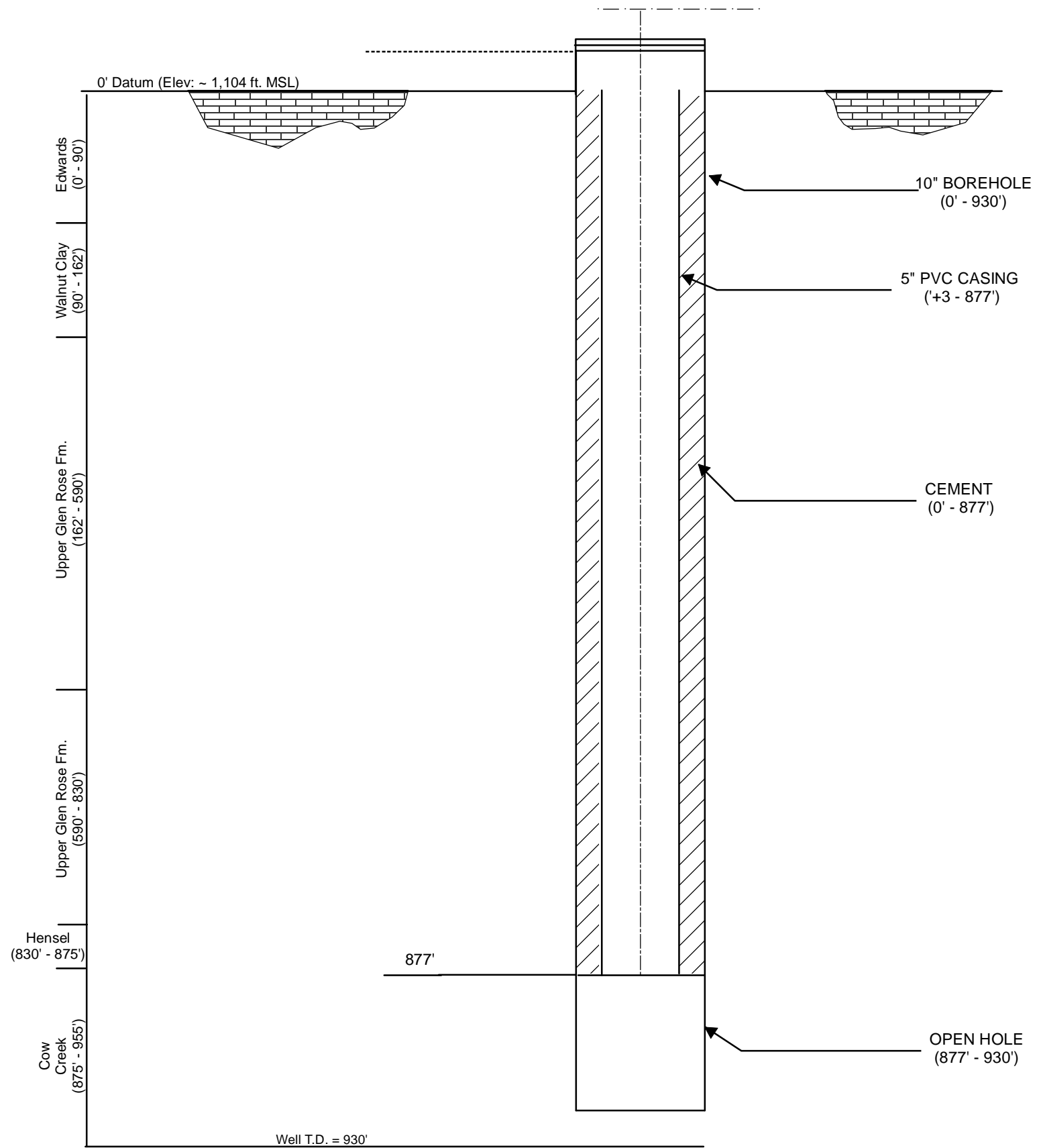
# Ochoa Monitor well



Construction Notes:  
5" PVC from +1.7 to 810 ft;  
Cemented from surface to 50 ft.  
Assume slotted at Kcc.

# Wood 01 Monitor well



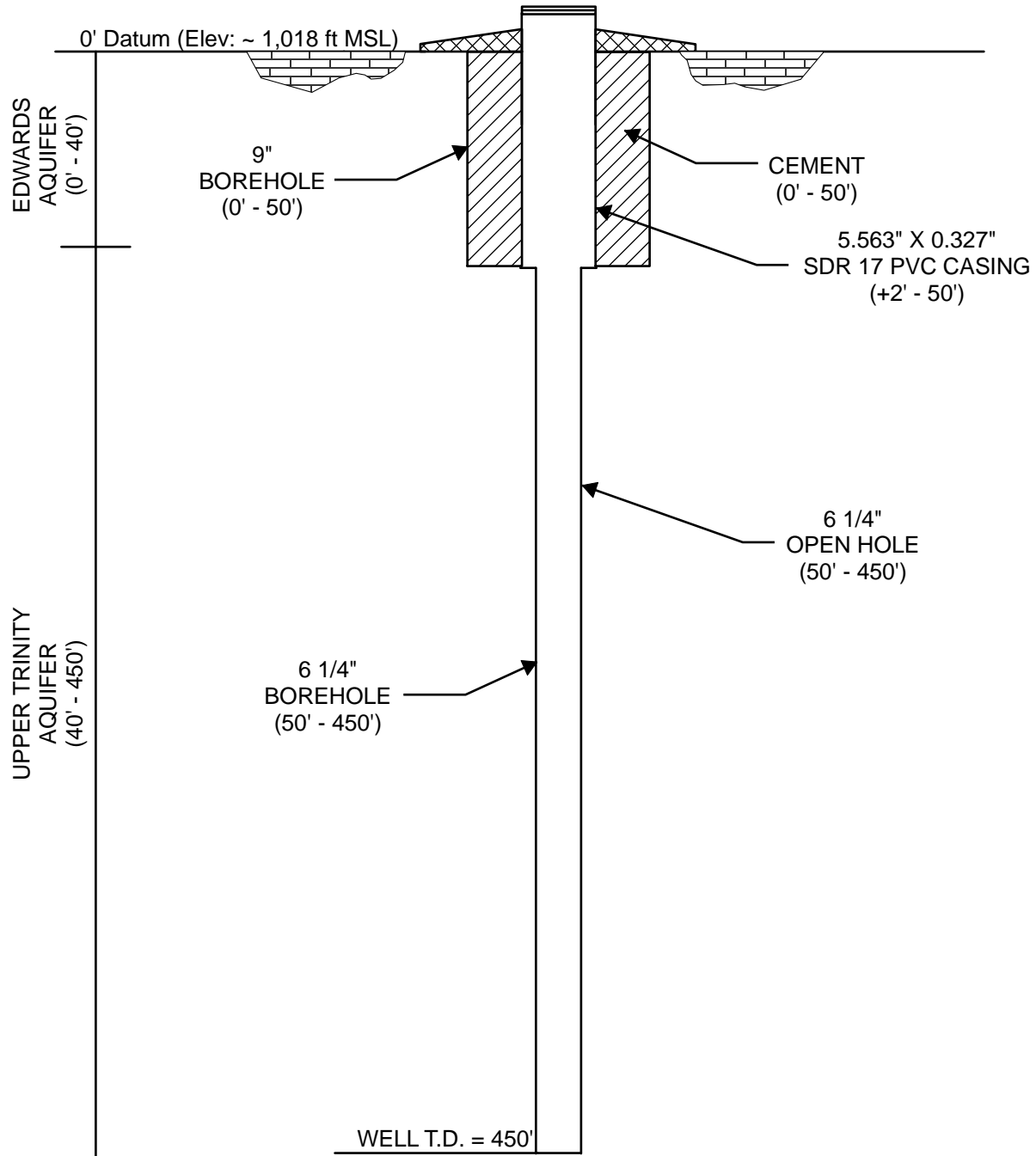


- Notes:**
1. Well profile based upon information provided by the District.
  2. Formational picks estimated based upon information provided by the District.

SCALE: NONE
APPROVED BY: KK DATE: 11-10-17
REVISED BY: DATE:
DRAWING NO: W-1
SHEET:

<b>Well Profile: Escondida 1 Well</b>	
<b>Electro Purification, LLC</b> Hays County, Texas	
	<b>Wet Rock Groundwater Services, LLC</b>
	Groundwater Specialists
	TBPG Firm No: 50038 317 Ranch Road 620 South, Suite 203 Austin, Texas 78734
	Ph: 512.773.3226 www.wetrockgs.com

## Well ID: EP UGR Monitor Well



**Wet Rock Groundwater Services, L.L.C.**  
**Groundwater Specialists**  
TBPG Firm No: 50038  
 317 Ranch Road 620 South, Ste. 203  
 Austin, Texas 78734 Ph: 512.773.3226  
 www.wetrockgs.com

Client: Electro Purification, LLC

Elevation: 1,018 ft. MSL

Location: Hays County, Texas

Total Depth: 450 ft.

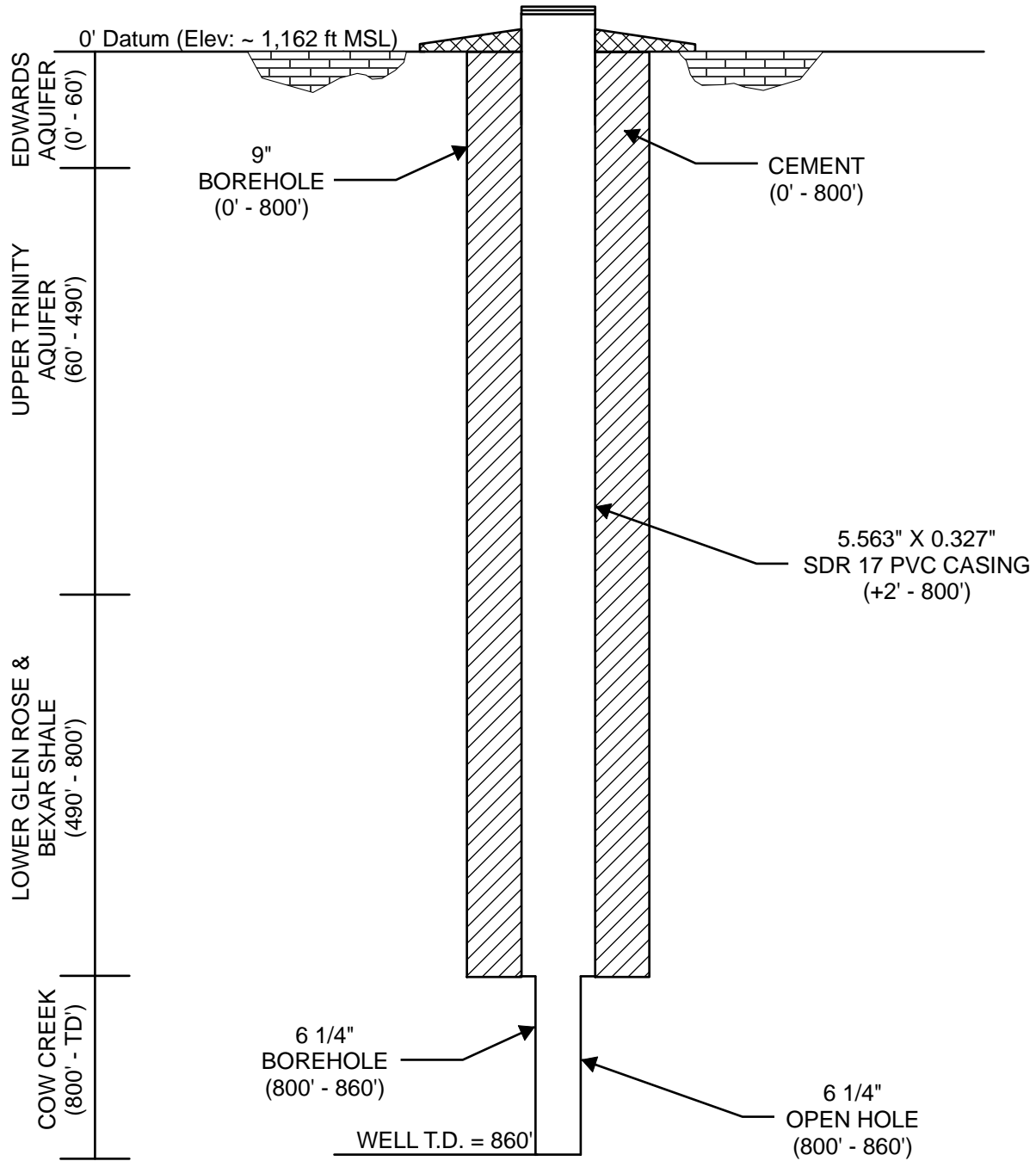
Driller: Hydro Resources Mid-Continent

Lat: 30° 2' 43.93" N

Drill Date: TBD

Long: 98° 1' 12.55" W

# Well ID: EP Western Monitor Well



**Wet Rock Groundwater Services, L.L.C.**  
**Groundwater Specialists**  
TBPG Firm No: 50038  
 317 Ranch Road 620 South, Ste. 203  
 Austin, Texas 78734 Ph: 512.773.3226  
[www.wetrockgs.com](http://www.wetrockgs.com)

Client: Electro Purification, LLC

Elevation: 1,162 ft. MSL

Location: Hays County, Texas

Total Depth: 860 ft.

Driller: Hydro Resources Mid-Continent

Lat: 30° 2' 56.93" N

Drill Date: TBD

Long: 98° 2' 11.00" W