



Control Number: 46948



Item Number: 23

Addendum StartPage: 0

PUC DOCKET NO. 46948  
SOAH DOCKET NO. 473-17-5930 WS

RECEIVED

2017 SEP 14 PM 4:40

APPLICATION OF VINEYARD RIDGE, §  
LLC TO OBTAIN A WATER §  
CERTIFICATE OF CONVENIENCE AND §  
NECESSITY IN GILLESPIE COUNTY §

PUBLIC UTILITY COMMISSION

OF TEXAS

**APPLICANT, VINEYARD RIDGE, LLC'S MOTION TO RECONSIDER  
ORDER NO. 6 GRANTING JOHN MCRAE'S MOTION TO INTERVENE  
AND REQUEST FOR A PUBLIC HEARING; AND  
ORDER REFERRING THE DOCKET TO SOAH**

**TO THE HONORABLE ADMINISTRATIVE LAW JUDGE:**

COMES NOW, Vineyard Ridge, LLC ("Applicant") and files this Motion to Reconsider Order No. 6 granting John McRae's Motion to Intervene and Request for a Public Hearing, and the separate Order referring the Docket to the State Office of Administrative Hearings ("SOAH") and in support thereof would show the Commission as follows:

**I.  
Introduction**

On March 15, 2017, Vineyard Ridge LLC (Applicant) filed an application to obtain a new water certificate of convenience and necessity (CCN) in Gillespie County the (Application) with the Public Utility Commission of Texas (the Commission). The Commission deemed the Application administratively complete on June 21, 2017, and the notice sufficient on July 21, 2017.

On August 11, 2017, John McCrae, an individual owning land in Gillespie County *but* outside of the proposed CCN area filed a motion to intervene and requested a public hearing on the Application. On August 29, 2017, the Commission issued an Order granting the motion to intervene. On August 30, 2017, the Commission entered a separate Order referring this Docket No. 46948 to the State Office of Administrative Hearings (SOAH) for assignment of an Administrative Law Judge (ALJ) to conduct a hearing.

The Applicant files this Motion in light of the fact that Mr. McRae, on the face of his Motion, fails to meet the Commission's definition of an "affected person" for purposes of the Commission's consideration of a CCN. PUC Rule 24.3 (5). Accordingly, the Order granting Mr. McRae's Motion to Intervene and Hearing Request should be reconsidered and, thereafter, the separate Orders granting the intervention and referring the matter to SOAH should be withdrawn and a new Order denying the Motion to Intervene and Hearing Request entered. As appropriate the Commission should also enter appropriate Order(s) rescinding the referral of the Docket to SOAH.

## II. Applicant's Response

### A. Mr. McRae is not an "Affected Person."

Mr. McRae is not entitled to intervene – he has no "standing." Accordingly, he is not entitled to a hearing.

To intervene and be granted a hearing, the requestor must meet the mandatory threshold "standing test" set out in Rule 24.3(5) of the Commission's Rules by demonstrating that they are an "affected person." The Rule defines "affected person" as follows:

**Affected person** -- Any landowner within an area for which an application for a new or amended certificate of public convenience and necessity is filed; any retail public utility affected by any action of the regulatory authority; any person or corporation whose utility service or rates are affected by any proceeding before the regulatory authority; or any person or corporation that is a competitor of a retail public utility with respect to any service performed by the retail public utility or that desires to enter into competition.

See PUC Rule 24.3(5). Mr. McRae is not a landowner within the "area" for which the Application for a new Certificate of Public Convenience and Necessity ("CCN") has been filed. His property is located more than a mile outside of the proposed CCN Area.

The “Area” for which Applicant seeks to obtain a CCN for retail water service is a 659.723-acre, more or less, tract of land it acquired in 2016 in Gillespie County, Texas (the “Property”). Attached hereto as Exhibit “1” is a true and correct copy of a map of the Area that is the same as the Property, which map is included as Attachment 4 in the CCN Application (the “Area Map”). The Area Map depicts the Property proposed to be included within the CCN (the “CCN Area”). Attached hereto as Exhibit “2” is a true and correct copy of a map depicting the same CCN Area and the separate land owned by Mr. McRae, which is located a mile or more from the proposed CCN Area.

Also attached hereto as Exhibit “3” is a true and correct copy of the recorded deed dated September 27, 2016, conveying the 659.723 acres, more or less, in Gillespie County, Texas, which is the CCN Area to be included in the proposed CCN conveying the Property to Vineyard Ridge, LLC, the Applicant for the CCN.

After obtaining ownership of the Property, Vineyard Ridge LLC filed an application for a subdivision plat with Gillespie County Commissioners Court in January 2017. That application for subdivision was granted on June 2017, and the plat recorded in Volume 5, pages 122-134 of the Official Public Records of Gillespie County, on or about July 21, 2017. A true and correct copy of the recorded subdivision plat containing the entire 659.723 acres of land defined herein as the Property and coterminous with the boundaries of the proposed CCN Area is attached hereto as Exhibit “4.”

Since securing the subdivision of the CCN Area, the Applicant has sold approximately 10 lots to third parties, none of whom are Mr. McRae. Copies of the recorded deeds for lots within the Vineyard Ridge Subdivision can be found in the Official Public Records of Gillespie County using the following information:



<b><u>Lot No.</u></b>	<b><u>Grantee's Name</u></b>	<b><u>Recording ID No.</u></b>	<b><u>Date of Deed</u></b>
12	Clayton H. Stewart and Brenda Stewart	20173912	8-7-17
50	David A. Wolzmuth and Catherine M. Wolzmuth, Co-Trustees of The Wozlmuth Family Trust dated May 17, 2017 and Successor Trustees	20173714	7-28-17
54	Daniel Sartor and Tina Sartor	20173883	8-4-17
74	Teresa B. Ambrose and Mark Ambrose	20173815	7-28-17
86	David Sitka and Deborah Sitka	20173884	8-4-17
90	Harry Ghafoori	20173882	8-4-17
103	Jay D. Smith and Brenda Smith	2017396	8-4-17
104	Tony Candia	20173934	8-8-17
120	Jeffrey S. Friday	20174106	8-14-17

Accordingly, Mr. McRae cannot demonstrate any standing as the “owner of land within the area of the proposed CCN,” as mandated by the Commission’s Rule 24.3 (5).

Furthermore, Mr. McRae neither alleges, nor has he presented any evidence that shows that he meets any of the other criteria in the Commission’s Rule 24.3 (5) for being an “affected person,” including the following:

- 1) that he is a retail public utility affected by any action of the regulatory authority,
- 2) that he is a person or corporation whose utility service or rates will be affected by any proceeding before the PUC or the Applicant, or
- 3) that he is a person or corporation who is in competition with the proposed retail utility that will serve within the certificated area.

Accordingly, Mr. McRae’s intervention should be denied or stricken, as appropriate.

**B. Mr. McRae Lacks a Justiciable Interest.**

Mr. McRae's attempt to bootstrap his position to become an affected person with bald allegations of a lack of groundwater to serve the proposed CCN Area are also disproved by matters of public record, including the following:

1) The entire proposed CCN Area is part of the Property that is now a platted subdivision approved by Gillespie County Commissioners Court acting pursuant to Chapter 232, Tex. Local Gov't Code and the County's Rules and Regulations applicable to subdivision platting – including demonstration of an adequate water supply to serve the subdivision. The Gillespie County Commissioners Court's approval was subject to compliance with the requirements of Section 35.019, Texas Water Code, and the County's subdivision and platting regulations, effective August 25, 2003, including Section H ("Water Availability Requirements"). True and correct copies of Section 35.019, Texas Water Code, and Section H of the Gillespie County subdivision platting rules are attached hereto as Exhibits "5" and "6," respectively.

2) Mr. McRae's intervention in these proceedings is nothing more than an inappropriate and untimely collateral attack on the decision of the Gillespie County Commissioners' Court to grant subdivision approval to Vineyard Ridge, LLC. The adequacy of available groundwater, in addition to being a criterion reviewed by the Gillespie County Commissioners Court as a condition to subdivision platting, is within the jurisdiction of the Hill Country Underground Water Conservation District (the "Hill Country District"), the statutorily created groundwater district constituting the preferred form of management of groundwater by the State of Texas for Gillespie County where the proposed CCN is located. *See* Tex. Water Code § 35.019; *cf. Id.* § 36.0015, *EAA v. Day*, 369 S.W.3d 814, 835 (Tex. 2012) (*citing Sipriano v. Great Spring Waters of Am., Inc.*, 1 S.W.3d 75, 81 (Tex. 1999) (Hecht, J., concurring); *see generally*

Tex. Special Dist. Local Laws Code Ch. 8844 (codifying Hill Country UWCD's enabling legislation). As evidenced by the true and correct copy of the letter dated October 6, 2016, attached hereto as Exhibit "7," the Hill Country District verified to the Gillespie County Commissioners Court, as required by Section 35.019 and Section H of Gillespie County Subdivision Platting Rules, that adequate groundwater was available to serve the lots proposed to be included within the platted subdivision, which is coterminous with the boundaries of the proposed CCN. The Hill Country District's determination was based, in part, upon an on-the-ground hydrogeologic study conducted by Wet Rock Groundwater Services, LLC, for the Applicant. The study, including a pump test, is documented in the report entitled "Report of Findings: Vineyard Ridge Subdivision Groundwater Availability Certification for Platting: Gillespie County, Texas (September 2016)," and a true and correct copy of which is attached hereto as Exhibit "8."

Moreover, the Applicant has taken the appropriate and necessary steps to have the water supply system to be operated within the CCN Area, declared to be a public water supply system by the TCEQ. Attached hereto as Exhibit "9," is a true and correct copy of a letter dated May 30, 2017, from the TCEQ, confirming the approval of the public water supply system, as proposed by the Applicant Vineyard Ridge LLC, and assigning the same Public Water Supply ID No. 0860144. Additionally, the Applicant has taken steps to secure the necessary permits from the Hill Country District to develop additional wells within the subdivision to provide service to the platted lots within the proposed CCN area. Attached hereto as Exhibit "10" is a true and correct copy of the transmittal letter and application for permits for two municipal supply groundwater wells submitted on April 4, 2017, to the Hill Country Underground Water District on behalf of the Applicant by its hydrogeologic consultant, Wet Rock Groundwater Services, LLC.

**C. Mr. McRae Lacks a Justiciable Interest With the PUC's Jurisdiction.**

In addition to not being an “affected person,” Mr. McRae also lacks a “justiciable interest.” In *City of Waco v. Tex. Comm’n on Environmental Quality*,<sup>1</sup> the Austin Court of Appeals determined that “an affected person” must have “justiciable interest” and meet the following requirements to have standing to request a contested case hearing before Texas Commission on Environmental Quality (“TCEQ”):

1. an “injury in fact” from the issuance of the permit as proposed - an invasion of a “legally protected interest” that is “concrete and particularized”, and
2. “actual or imminent, not conjectural or hypothetical”, and
3. the injury must be “fairly traceable” to the issuance of the permit as proposed, as opposed to the independent actions of third parties or other alternative causes unrelated to the permit; and
4. it must be likely, and not merely speculative, that the injury will be redressed by a favorable decision on its complaints regarding the proposed permit (i.e., refusing to grant the permit or imposing additional conditions).<sup>2</sup>

The Court’s test is equally applicable in the context of this Docket No. 46948.

Mr. McRae lacks a justiciable interest that is cognizable or within the jurisdiction of the PUC under the test outlined above. Because Mr. McRae is not an “Affected Person” within the criteria mandated by Rule 24.3 (5), Mr. McRae’s concerns are neither concrete nor particularized, nor constitute an injury in fact. Instead, they are merely concerns that would be common to those of other members of the public for purposes of the CCN Application before the Commission.

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<sup>1</sup> *City of Waco v. Tex. Comm’n on Environmental Quality*, 346 S.W.3d 781, 802 (Tex. App. – Austin 2011) *rev’d on other grounds*, 413 S.W.3d 409 (Tex. 2013). A true and correct copy of the Austin Court of Appeal’s opinion is attached hereto as Appendix “A”.

<sup>2</sup> *Id.* at 802

Moreover, the Petition for Intervention and Request for Hearing provides no evidence of an imminent or actual damage or injury to Mr. McRae's property that would result from the granting of a CCN to the Applicant. Mr. McRae's complaints regarding the availability and adequacy of groundwater to serve the area within the proposed CCN and region generally are not specific to the land within the CCN. Instead, they are concerns common to the public that there may not be enough groundwater in the region for his use, or that the granting of the CCN and the production of groundwater from the Property, which is a constitutionally protected right of the landowner, Vineyard Ridge, LLC, raise issues that might be properly presented to the Hill Country Underground Water Conservation District assuming Mr. McRae can demonstrate that he is an Affected Person and has a justiciable interest that is concrete and particularized to him, rather than merely concerns of members of the general public in a permit proceeding before the District. His claims, however, do not satisfy the criteria for intervention in the PUC, particularly in the context of a CCN application.

Mr. McRae's claims of impact to groundwater within his property is not an injury that is "fairly traceable" to the issuance of a CCN by the PUC. The issuance of a CCN merely grants the holder the right to a monopoly to provide retail water within the area described within the Certificated Area. The holder of the CCN has a statutory duty pursuant to Section 13.250 (a) to provide continuous and adequate water supply service within the Certificated Area. The source(s) of that water is a duty and obligation of the CCN holder to secure and provide. Groundwater from the property within the Certificated Area is one alternative. The CCN holder also has the ability and opportunity to secure alternative and supplemental water supplies, be it groundwater or surface water, from other sources. Accordingly, Mr. McRae's intervention and request for hearing fails to meet the third prong of the test articulated by the Waco Court.

Finally, Mr. McRae's request fails to satisfy the fourth prong of the Waco Court's test for demonstration that he is an Affected Person with a justiciable interest. As noted above, granting the CCN, or in this case denial of the CCN, will not address his concern regarding the adequacy of groundwater within the area. Assuming the Commission were to grant Mr. McRae's request, and, thereafter, deny the Application for a CCN, the Applicant continues to have the right to produce groundwater from his property. Accordingly, denial of the CCN provides no relief to Mr. McRae that would address his alleged injury. Based upon all the information available demonstrating the availability of adequate groundwater supplies, the Applicant could allow individual lot owners to drill their own wells to produce up to 25,000 gallons of water per day each using exempt wells. *See* Tex. Water Code § 36.117. Accordingly, denial of the CCN will not achieve or address the complaint and alleged injury complained of by Mr. McRae regarding the inadequacy of groundwater within the region and the speculative concern that production of groundwater within the CCN area could impact Mr. McRae's ability to pump groundwater, an issue not within the jurisdiction of the PUC. Accordingly, within the test established by the *City of Waco* decision, Mr. McRae is neither an Affected Person nor does he have a justiciable interest.

Mr. McRae is not an "affected person." He has failed to demonstrate that he is an "affected person" or has a "justiciable interest" that could give him standing in this matter. Accordingly, his request for intervention should be dismissed and his request for a contested case hearing denied. PUC Rule 23.4 (5); *see City of Waco v. Tex. Comm'n on Environmental Quality*, 346 S.W.3d 781, 802 (Tex. App. – Austin 2011) *rev'd on other grounds*, 413 S.W.3d 409 (Tex. 2013).

**D. Affidavit of Davy Roberts, Project Manager of Applicant Vineyard Ridge, LLC.**

Attached hereto as Exhibit 11 is a true and correct copy of an Affidavit executed by Mr. Davy Roberts, Project Manager, Vineyard Ridge, LLC, the Applicant in this Docket No. 46948

for a CCN to provide retail water supply service within the Vineyard Ridge Subdivision in Gillespie County, Texas. Mr. Roberts' Affidavit supports and corroborates the information provided herein and provides further evidence based upon his personal knowledge of the fact that Mr. McRae is not an "affected person" within the meaning of Rule 24.3(5). Accordingly, Mr. McRae's intervention should be denied or dismissed as appropriate and his request for a contested case hearing in connection with the Application for a CCN in this Docket should be denied.

## II. Conclusion

Wherefore, premises considered, the intervention and hearing request of Mr. McRae, a person who is not an "Affected Person" under the Commission's Rules, and lacks standing, should be dismissed and denied, and upon final processing, the CCN requested by Vineyard Ridge, LLC should be continued and the CCN granted.

Respectfully submitted,

MCCARTHY & MCCARTHY, L.L.P.

Edmond R. McCarthy, Jr.  
1122 Colorado St., Suite 2399  
Austin, Texas 78701  
(512) 904-2313 phone  
(512) 692-2826 facsimile  
[ed@ermlawfirm.com](mailto:ed@ermlawfirm.com)

/s/ Edmond R. McCarthy, Jr. \_\_\_\_\_  
Edmond R. McCarthy, Jr.  
State Bar No. 13367200

ATTORNEYS FOR VINEYARD RIDGE, LLC

**List of Exhibits & Appendices**

Exhibit “1”	Map included as Attachment 4 in the CCN Application depicting the area proposed to be included within the CCN.
Exhibit “2”	Map depicting the same CCN area and the land owned by Mr. McRae located a mile or more from the proposed CCN area.
Exhibit “3”	Deed dated September 27, 2016, conveying the 659.723 acres, more or less, in Gillespie County, Texas to be included in the proposed CCN into Vineyard Ridge, LLC, the Applicant for the CCN, and recorded as Doc. ID No. 20164806 in the Official Public Records of Gillespie County, Texas
Exhibit “4”	Subdivision plat containing the entire 659.723 acres of land, recorded in Vol. 5, pages 122-137 of the Plat Records of Gillespie County, Texas.
Exhibit “5”	Copy of Section 35.019, Texas Water Code.
Exhibit “6”	Section H of the Gillespie County subdivision platting rules.
Exhibit “7”	Letter dated October 6, 2016, evidencing the Hill Country District verified to the Gillespie County Commissioners Court, as required by Section 35.019 and Section H of the Gillespie County Subdivision Platting Rules, that adequate groundwater was available to serve the lots proposed to be included within the platted subdivision.
Exhibit “8”	Wet Rock Groundwater Services LLC’s Report entitled “Report of Findings: Vineyard Ridge Subdivision Groundwater Availability Certification for Platting: Gillespie County, Texas (September 2016)”
Exhibit “9”	Letter dated May 30, 2017, from the TCEQ, confirming the approval of the public water supply system as proposed by the Applicant Vineyard Ridge LLC
Exhibit “10”	Transmittal letter and application for permits for two municipal supply groundwater wells submitted on April 4, 2017, to the Hill Country Underground Water District on behalf of the Applicant by its hydrogeologic consultant, Wet Rock Groundwater Services, LLC.
Exhibit “11”	Affidavit of Davy Roberts, Project Manager, Vineyard Ridge, LLC, dated September 7, 2017.
Appendix “A”	<i>City of Waco v. Tex. Comm’n on Environmental Quality</i> , 346 S.W.3d 781 (Tex. App. – Austin 2011), <i>rev’d on other grounds</i> , 413 S.W.3d 409 (Tex. 2013).



**CERTIFICATE OF SERVICE**

I hereby certify, by my signature below, that a true and correct copy of the above Response to John McRae's Motion to Intervene and Request for a Public Hearing was electronically filed with the Commission, and with SOAH, and pursuant to Rule 22.74, forwarded via regular first-class mail and e-mail on this 14<sup>th</sup> day of September, 2017, to the Parties or their legal counsel at the locations shown on the service list.

/s/ Edmond R. McCarthy, Jr. \_\_\_\_\_  
Edmond R. McCarthy, Jr.

**SERVICE LIST**

Vineyard Ridge, LLC  
Attn: Davy Roberts  
P.O. Box 1987  
Marble Falls, TX 78654  
Fax: 800-511-2430

Susana E. Canseco  
Branscomb PC  
711 Navarro Street, Ste. 500  
San Antonio, TX 78205  
(210) 598-5416  
(210) 598-5405 (Fax)  
E-mail: [SCanseco@branscombps.com](mailto:SCanseco@branscombps.com)

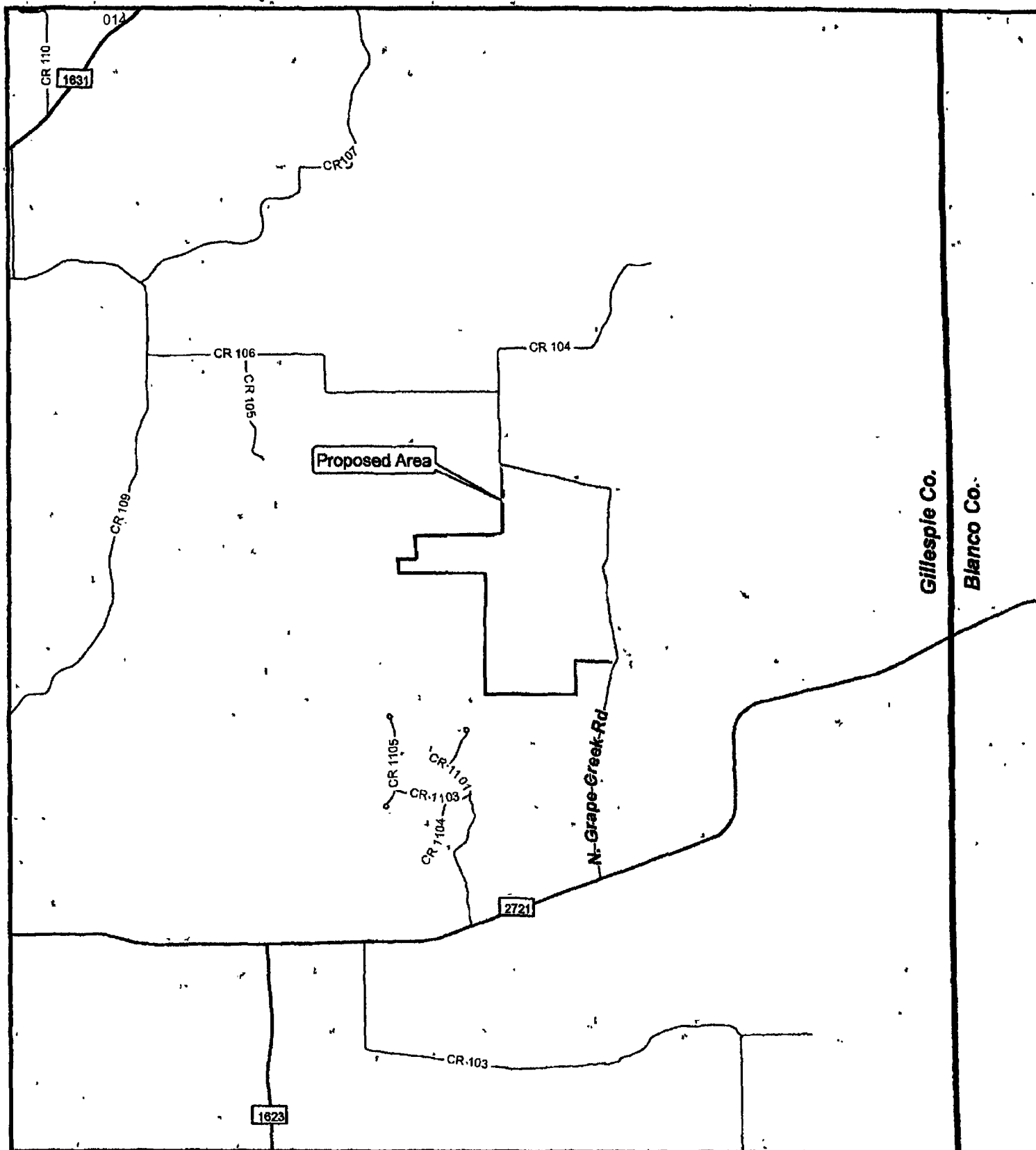
Representing John McRae

TJ Harris  
Attorney – Legal Division  
Public Utility Commission of Texas  
P.O. Box 13326  
Austin, Texas 78711  
(512) 936-7216  
(512) 936-7268 (Fax)  
E-mail: [TJ.Harris@puc.texas.gov](mailto:TJ.Harris@puc.texas.gov)

Representing Public Utility Commission of Texas –  
Legal Division

Bryan Boyd, P.E.  
Wet Rock Groundwater Services, LLC  
317 Ranch Road 620 South, Suite 203  
Austin, TX 78734

# **Exhibit “1”**



Scale: 0 2,000 4,000 Feet

Drawn By: BB Date: 10-3-16

Quad Name and No:  
Cave Creek School, TX 30098-C6

Projection:  
UTM NAD 83 Zone 14



### Proposed Water CCN Area

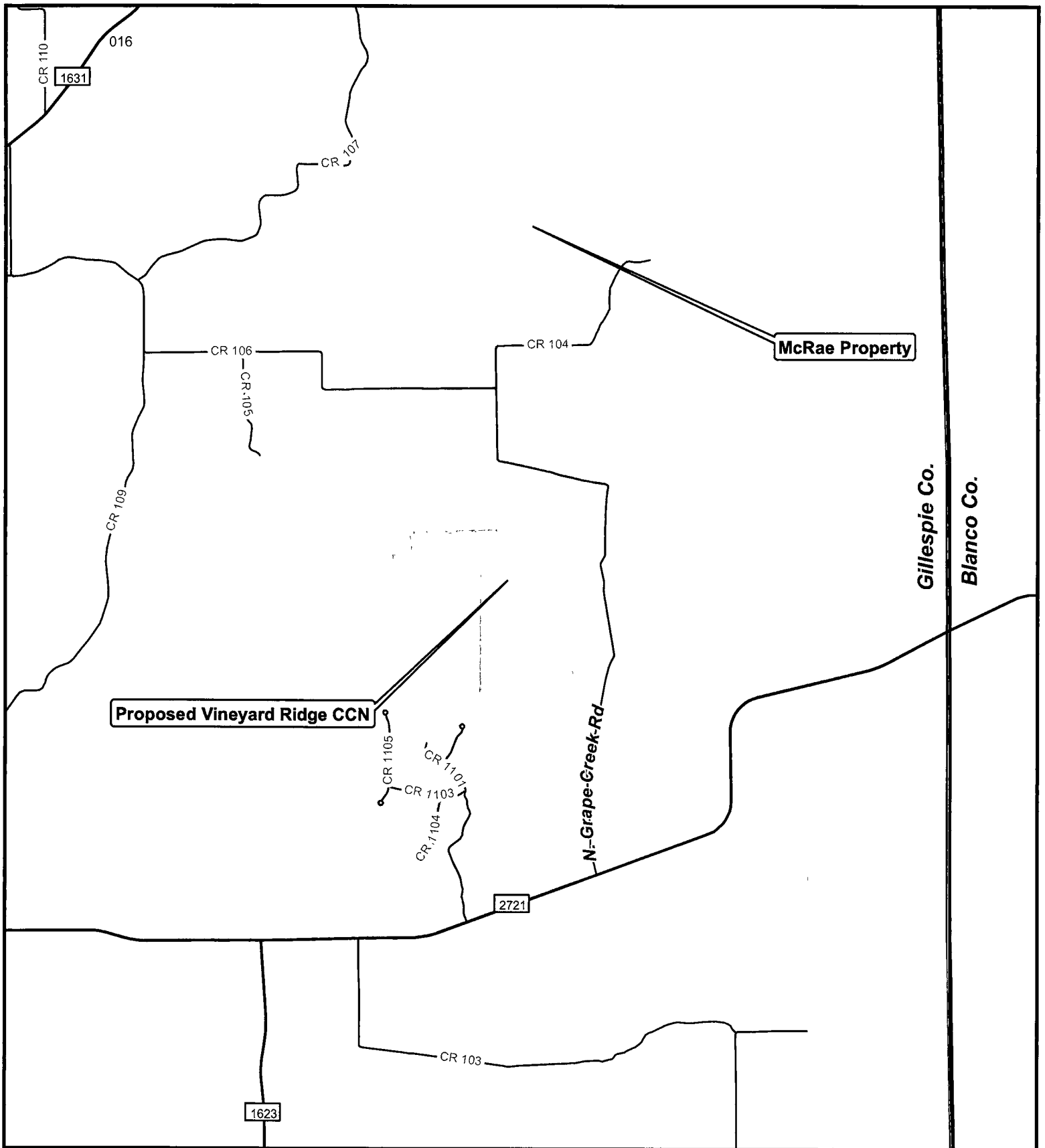
**Vineyard Ridge, LLC**  
Gillespie County, Texas



**Wet Rock Groundwater Services, L.L.C.**  
Groundwater Specialists

TBPG Perm No: 50038  
317 Ranch Road 620 South, Ste. 203  
Austin, Texas 78734 Ph: 512.773.3226  
[www.wetrockgs.com](http://www.wetrockgs.com)

## **Exhibit “2”**



Scale: 0 2,000 4,000 Feet

Drawn By: BB Date: 10-3-16

Quad Name and No:  
Cave Creek School, TX 30098-C6

Projection:  
UTM NAD 83 Zone 14



### Proposed Water CCN Area

**Vineyard Ridge, LLC**  
Gillespie County, Texas



**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)

## **Exhibit “3”**

018

20162016

11 PGS  
LD

20164806

**NOTICE OF CONFIDENTIALITY RIGHTS: IF YOU ARE A NATURAL PERSON, YOU MAY REMOVE OR STRIKE ANY OR ALL OF THE FOLLOWING INFORMATION FROM ANY INSTRUMENT THAT TRANSFERS AN INTEREST IN REAL PROPERTY BEFORE IT IS FILED FOR RECORD IN THE PUBLIC RECORDS: YOUR SOCIAL SECURITY NUMBER OR YOUR DRIVER'S LICENSE NUMBER.**

**Warranty Deed with Vendor's Lien**

**Date:** September 27, 2016

**Grantor:** Lawrence Paul Nebgen, a married person dealing with his sole and separate property; and Elaine E. Harper, a married person dealing with her sole and separate property

**Grantor's Mailing Address:**

Lawrence Paul Nebgen  
685 Klett Ranch Rd.  
Johnson City, Texas 78636  
Blanco County

Elaine E. Harper  
306 Westmoor  
Fredericksburg, Texas 78624  
Gillespie County

**Grantee:** Vineyard Ridge, LLC

**Grantee's Mailing Address:**

Vineyard Ridge, LLC  
665 Simonds Road  
Williamstown, MA 01267

**Consideration:**

Cash, and as part of an I.R.C. §1031 Exchange with respect to the purchase price to be paid to Elaine E. Harper, and a note of even date executed by Grantee and payable to the order of Crockett National Bank in the principal amount of TWO MILLION THREE HUNDRED NINETY ONE THOUSAND NINE HUNDRED AND NO/100 DOLLARS (\$2,391,900.00). The note is secured by a first and superior vendor's lien and superior title retained in this deed in favor of Crockett National Bank and by a first-lien deed of trust of even date from Grantee to TODD HUCKABEE, Trustee.

✓

**Property (including any improvements):**

659.723 acres of land, more or less, situated in the W. Price Survey No. 219, Abstract No. 540, the J. Mackey Survey No. 743, Abstract No. 481, the H. Kammann Survey No. 296, Abstract No. 853, the W. Lindeman Survey No. 295, Abstract No. 872, the E. Klamer Survey No. 808, Abstract No. 1657, the A. Rodriguez Survey No. 8, Abstract No. 570 and the R. Means Survey No. 6, Abstract No. 457, Gillespie County, Texas, being all of a called 659.723 acre tract of land based on a survey conducted by Hambright Land Surveying in September of 2013 and being all of that certain 666.44 acre tract of land in Document No. 20090373, Official Public Records of Gillespie County, Texas, said 659.723 acre tract being more particularly described by metes and bounds in Exhibit "A" attached hereto and made a part hereof for all pertinent purposes.

**Reservations from and Exceptions to Conveyance and Warranty:**

None, except those of record; Liens described as part of the Consideration and any other liens described in this deed as being either assumed or subject to which title is taken; validly existing easements, rights-of-way, and prescriptive rights, whether of record or not; all presently recorded and validly existing instruments, other than conveyances of the surface fee estate, that affect the Property; and taxes for 2016, which Grantee assumes and agrees to pay, but not subsequent assessments for that and prior years due to change in land usage, ownership, or both, the payment of which Grantor assumes.

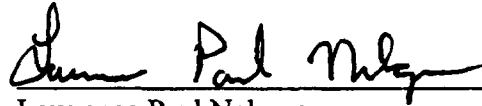
Grantor, for the Consideration and subject to the Reservations from Conveyance and the Exceptions to Conveyance and Warranty, grants, sells, and conveys to Grantee the Property, together with all and singular the rights and appurtenances thereto in any way belonging, to have and to hold it to Grantee and Grantee's heirs, successors, and assigns forever. Grantor binds Grantor and Grantor's heirs and successors to warrant and forever defend all and singular the Property to Grantee and Grantee's heirs, successors, and assigns against every person whomsoever lawfully claiming or to claim the same or any part thereof, except as to the Reservations from Conveyance and the Exceptions to Conveyance and Warranty.

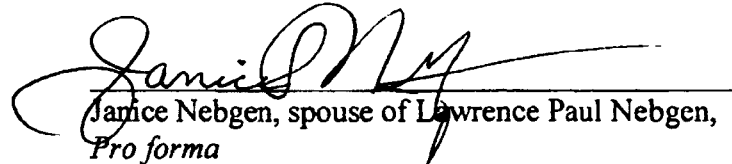
The vendor's lien against and superior title to the Property are retained until each note described is fully paid according to its terms, at which time this deed will become absolute.

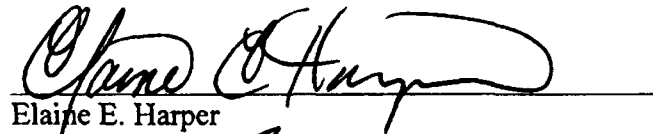
Crockett National Bank, at Grantee's request, has paid in cash to Grantor that portion of the purchase price of the Property that is evidenced by the note. The first and superior vendor's lien against and superior title to the Property are retained for the benefit of Crockett National Bank and are transferred to Crockett National Bank without recourse against Grantor.

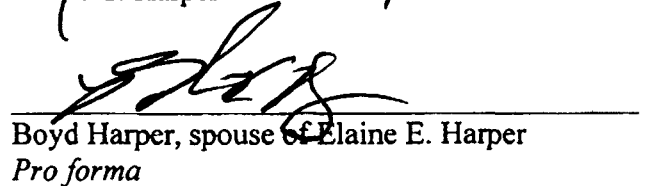


When the context requires, singular nouns and pronouns include the plural.

  
Lawrence Paul Nebgen

  
Janice Nebgen, spouse of Lawrence Paul Nebgen,  
*Pro forma*

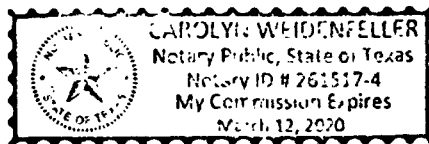
  
Elaine E. Harper

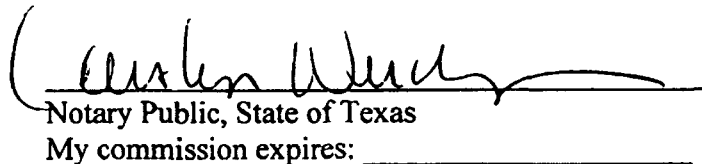
  
Boyd Harper, spouse of Elaine E. Harper  
*Pro forma*

STATE OF TEXAS )

COUNTY OF GILLESPIE )

This instrument was acknowledged before me on September 27, 2016, by  
Lawrence Paul Nebgen.

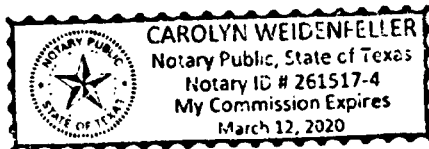


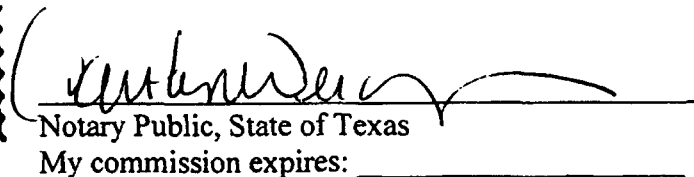
  
Notary Public, State of Texas  
My commission expires: \_\_\_\_\_

STATE OF TEXAS )

COUNTY OF GILLESPIE )

This instrument was acknowledged before me on September 27, 2016, by  
Janice Nebgen, spouse of Lawrence Paul Nebgen, *pro forma*.

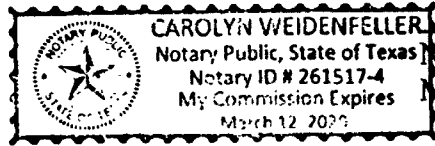


  
Notary Public, State of Texas  
My commission expires: \_\_\_\_\_

STATE OF TEXAS )

COUNTY OF GILLESPIE )

This instrument was acknowledged before me on Sept 27, 2016, by Elaine E. Harper.

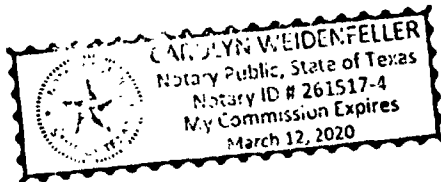


[Signature]  
 Notary Public, State of Texas  
 My commission expires: \_\_\_\_\_

STATE OF TEXAS )

COUNTY OF GILLESPIE )

This instrument was acknowledged before me on Sept 27, 2016, by Boyd Harper, spouse of Elaine E. Harper, *pro forma*



[Signature]  
 Notary Public, State of Texas  
 My commission expires: \_\_\_\_\_

PREPARED IN THE OFFICE OF:

Zachary P. Hudler, P.C.  
 Attorney at Law  
 P.O. Box 1728  
 Johnson City, Texas 78636

AFTER RECORDING RETURN TO:

Fredericksburg Titles, Inc.  
 203 W. Austin Street  
 Fredericksburg, Texas 78624

**EXHIBIT "A"****MATKIN HOOVER  
ENGINEERING & SURVEYING**

8 SPENCER ROAD, SUITE 100, BOERNE, TEXAS 78006  
 PHONE: 830-249-0600 FAX: 830-249-0099  
 TEXAS REGISTERED SURVEYING FIRM F-10024000

**FIELD NOTES FOR A 659.723 ACRE TRACT OF LAND**

BEING A 659.723 ACRE TRACT OF LAND LOCATED IN THE W. PRICE SURVEY NO. 219, ABSTRACT NO. 540, THE J. MACKEY SURVEY NO. 743, ABSTRACT NO. 481, THE H. KAMMANN SURVEY NO. 296, ABSTRACT NO. 853, THE W. LINDEMAN SURVEY NO. 295, ABSTRACT NO. 872, THE E. KLARNER SURVEY NO. 808, ABSTRACT NO. 1657, THE A. RODRIGUEZ SURVEY NO. 8, ABSTRACT NO. 570, AND THE R. MEANS SURVEY NO. 6, ABSTRACT NO. 457, GILLESPIE COUNTY, TEXAS, BEING ALL OF A CALLED 659.90 ACRE TRACT OF LAND BASED ON A SURVEY CONDUCTED BY HAMBRIGHT LAND SURVEYING IN SEPTEMBER OF 2013 AND BEING ALL OF THAT CERTAIN 666.44 ACRE TRACT OF LAND RECORDED IN DOCUMENT NO. 20090373, OFFICIAL PUBLIC RECORDS OF GILLESPIE COUNTY, TEXAS, SAID 659.723 TRACT BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

Beginning at a 3" metal fence post found in the south line of North Grape Creek Road, for a northwest corner of the herein described tract, the northwest corner of said 659.90 acre tract, said point being a northeast corner of the Douglas J. Schmidt called 15.71 acre tract, recorded in Volume 167, Pages 613-624, Deed Records of Gillespie County, Texas;

- (1) Thence, with the south and west lines of North Grape Creek Road, the north and east boundary lines of the herein described tract, and the north and east boundary lines of said 659.90 acre tract, the following courses and distance:
- a. S 78° 25' 45" E, 1081.73' (S 77° 34' 10" E, 1081.94', record) to a ½" iron rod with red "Matkin Hoover Eng. & Survey" plastic cap set for angle;
  - b. S 77° 20' 15" E, 474.28' (S 76° 27' 24" E, 474.41', record) to a 3" metal fence post found for angle;
  - c. S 78° 00' 15" E, 72.18' (S 77° 03' 55" E, 72.12', record) to a 3" wood fence post found for angle;
  - d. S 76° 52' 36" E, 172.64' (S 76° 00' 30" E, 172.63', record) to a 3" metal fence post found for angle;
  - e. S 64° 18' 40" E, 61.62' (S 63° 19' 05" E, 61.51', record) to a 3" metal fence post found for angle;
  - f. S 76° 43' 31" E, 270.64' (S 75° 54' 13" E, 270.76', record) to a 3" metal fence post found for angle;
  - g. S 76° 46' 27" E, 109.28' (S 75° 49' 44" E, 109.49', record) to a 3" metal fence post found for angle;
  - h. S 79° 07' 49" E, 207.54' (S 78° 15' 38" E, 207.20', record) to a 4" wood fence post found for angle;
  - i. S 78° 54' 15" E, 346.82' (S 77° 59' 02" E, 347.11', record) to a 3" metal fence post found for angle;

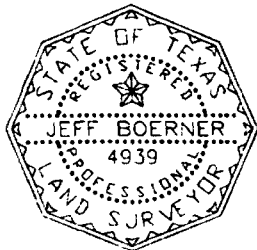
- j. S 79° 29' 44" E, 89.02' (S 78° 38' 40" E, 88.76', record) to a 4" wood fence post found for angle;
  - k. S 79° 48' 26" E, 255.38' (S 78° 57' 42" E, 255.94', record) to a 4" wood fence post found for angle;
  - l. S 82° 17' 48" E, 352.88' (S 81° 27' 34" E, 352.80', record) to a 3" metal fence post found for angle;
  - m. S 51° 52' 29" E, 72.41' (S 50° 51' 05" E, 72.40', record) to a 3" metal fence post found for angle;
  - n. S 05° 22' 43" W, 102.50' (S 06° 18' 00" W, 101.92', record) to a 2" wood fence post found for angle;
  - o. S 05° 43' 12" W, 157.59' (S 06° 34' 55" W, 157.74', record) to a 4" wood fence post found for angle;
  - p. S 06° 09' 47" W, 176.65' (S 07° 02' 16" W, 176.51', record) to a 4" wood fence post found for angle;
  - q. S 02° 00' 31" W, 349.86' (S 02° 53' 13" W, 348.69', record) to a metal "T" post found for angle;
  - r. S 00° 34' 14" W, 526.83' (S 02° 01' 13" W, 514.42', record) to a 3" metal fence post found for angle;
  - s. S 21° 23' 52" W, 40.02' (S 11° 06' 12" W, 50.28', record) to a 3" metal fence post found for angle;
  - t. S 00° 44' 33" E, 846.51' (S 00° 11' 23" E, 848.75', record) to a ½" iron rod found for angle;
  - u. S 27° 32' 14" W, 318.28' (S 28° 23' 06" W, 318.22', record) to a 3" metal fence post found for angle;
  - v. S 12° 38' 43" E, 290.05' (S 11° 47' 04" E, 288.53', record) to a metal "T" post found for angle;
  - w. S 12° 06' 42" E, 354.85' (S 11° 13' 37" E, 356.52', record) to a 3" metal fence post found for angle;
  - x. S 04° 12' 42" W, 204.23' (S 05° 04' 11" W, 204.25', record) to a 3" metal fence post found for angle;
  - y. S 10° 11' 17" E, 710.07' (S 09° 18' 08" E, 710.22', record) to a ½" iron rod with red "Matkin Hoover Eng. & Survey" plastic cap set for angle;
  - z. S 10° 12' 14" E, 436.61' (S 09° 21' 16" E, 436.57', record) to a ½" iron rod with red "Matkin Hoover Eng. & Survey" plastic cap set for angle;
  - aa. S 10° 12' 13" E, 924.85' (S 09° 18' 05" E, 924.90', record) to a ½" iron rod found for angle;
  - bb. S 27° 09' 52" W, 204.64' (S 27° 58' 54" W, 204.47', record) to a 3" metal fence post found for corner in the north boundary line of a called 1096.79 acre tract recorded in Document No. 20110824, Official Public Records of Gillespie County, Texas, a southeast corner of said 659.90 acre tract;
- (2) Thence, departing the west line of North Grape Creek Road, with north and west boundary lines of the called 1096.79 acre tract, the south and east boundary lines of the herein described tract, the south and east boundary lines of said 659.90 acre tract, the following courses and distances:

- a. **N 87° 56' 08" W, 1186.98'** (N 87° 03' 41" W, 1187.29', record) to a ½" iron rod with red "Matkin Hoover Eng. & Survey" plastic cap set for angle;
  - b. **S 02° 05' 40" E, 1079.59'** (S 01° 13' 26" E, 1079.96', record) to a ½" iron rod found for corner at a southeast corner of said 659.90 acre tract, the northeast corner of a called 450.52 acre tract recorded in Volume 50, Pages 774-779, Deed of Trust Records of Gillespie County, Texas;
- (3) **Thence**, departing the west boundary line of the called 1096.79 acre tract, with the north boundary line of the called 450.52 acre tract, a south boundary line of the herein described tract, a south boundary line of said 659.90 acre tract, the following courses and distances:
- a. **S 89° 11' 17" W, 1321.96'** (N 89° 57' 25" W, 1321.10', record) to a ½" iron rod with red "Matkin Hoover Eng. & Survey" plastic cap set for angle;
  - b. **S 89° 08' 59" W, 1666.41'** (N 89° 56' 34" W, 1666.91', record) to a ½" iron rod found for corner at a southwest corner of said 659.90 acre tract, at the northwest corner of the called 450.52 acre tract, said point being in the east boundary line of Tract 11, Seven Falls Ranch Subdivision, recorded in Volume 2, Pages 197-200, Plat Records of Gillespie County, Texas;
- (4) **Thence**, with the east boundary line of Tract 11, a west boundary line of the herein described tract, a west boundary line of said 659.90 acre tract, the following courses and distances:
- a. **N 00° 11' 39" W, 2203.49'** (N 00° 39' 38" E, 2203.31', record) to a 5" metal fence post found for angle;
  - b. **N 00° 08' 25" W, 518.54'** (N 00° 44' 14" E, 518.67', record) to a ½" iron rod with red "Matkin Hoover Eng. & Survey" plastic cap set for angle;
  - c. **N 00° 07' 12" E, 1117.78'** (N 00° 59' 36" E, 1117.84', record) to a 3" metal fence post found for interior corner, at an interior corner of said 659.90 acre tract, said point being the northeast corner of said Tract 11;
- (5) **Thence**, with the north line of said Tract 11, a south boundary line of the herein described tract, a south boundary line of said 659.90 acre tract, the following courses and distances:
- a. **S 88° 30' 37" W, 346.81'** (S 89° 25' 45" W, 345.83', record) to a 2" wood fence post found for angle;
  - b. **S 88° 44' 44" W, 825.47'** (S 89° 35' 37" W, 824.89', record) to a 6" wood fence post found for angle;
  - c. **S 88° 59' 31" W, 822.29'** (S 89° 52' 46" W, 824.10', record) to a ½" iron rod found for angle;
  - d. **S 89° 12' 24" W, 510.83'** (S 89° 58' 01" W, 510.30', record) to a 6" wood fence post found for angle at the northwest corner of said Tract 11, the northeast corner of a called 69 ½ acre tract designated as Tract 3, recorded in Volume 501, Pages 133-140, Official Public Records of Gillespie County, Texas;

- (6) **Thence, N 88° 39' 48" W**, with the north boundary line of the called 69 ½ acre tract, a south boundary line of the herein described tract, a south boundary line of said 659.90 acre tract, a distance of **238.02'** (N 87° 41' 50" W, 238.64', record) to an 8" wood fence post found for corner at a southwest corner of said 659.90 acre tract, at the southeast corner of a called 46.3 acre tract designated as Tract 1, recorded in Volume 501, Pages 133-140, Official Public Records of Gillespie County, Texas;
- (7) **Thence, N 07° 51' 01" W**, departing the north boundary line of the called 69 ½ acre tract, with the east boundary line of the called 46.3 acre tract, a west boundary line of the herein described tract, the west boundary of said 659.90 acre tract, a distance of **533.04'** (N 07° 00' 46" W, 533.26', record) to a 3" metal fence post found for a northwest corner, a northwest corner of said 659.90 acre tract, at a northeast corner of the called 46.3 acre tract, said point being in the south boundary line of a called 21.2 acre tract designated as "Tract 2", recorded in Volume 531, Pages 787-817, Official Public Records of Gillespie County, Texas;
- (8) **Thence**, with the south and east boundary lines of the called 21.2 acre tract, the north and west boundary lines of the herein described tract, the north and west boundary lines of said 659.90 acre tract, the following courses and distances:
- a. **N 89° 03' 48" E, 622.13'** (N 89° 56' 49" E, 622.66', record) to a 3" metal fence post found for interior corner;
  - b. **N 07° 24' 03" W, 729.35'** (N 06° 29' 28" W, 729.41', record) to a 3" metal fence post found for angle;
  - c. **N 31° 47' 18" E, 10.40'** (N 29° 33' 37" E, 10.32', record) to a 3" metal fence post found for a northwest corner, a northwest corner of said 659.90 acre tract, at a northeast corner of the called 21.2 acre tract, said point being in the south boundary line of a called 153.9 acre tract designated as "Tract 4", recorded in Volume 531, Pages 787-817, Official Public Records of Gillespie County, Texas;
- (9) **Thence, N 87° 56' 22" E**, with the south boundary line of the called 153.9 acre tract, a north boundary line of the herein described tract, a north boundary line of said 659.90 acre tract, a distance of **1427.47'** (N 88° 49' 57" E, 1427.30', record) to a ½" iron rod with red "Matkin Hoover Eng. & Survey" plastic cap set for angle;
- (10) **Thence, N 87° 42' 56" E**, continuing with the south boundary line of the called 153.9 acre tract, the south boundary line of the Dennis B. Schmidt called 15.71 acre tract recorded in Volume 167, pages 613-624, Deed Records of Gillespie County, Texas, a north boundary line of the herein described tract, a north boundary line of said 659.90 acre tract, a distance of **1373.03'** (N 88° 35' 07" E, 1373.32', record) to a 3" metal fence post found for interior corner, an interior corner of said 659.90 acre tract, at the southeast corner of the Dennis B. Schmidt called 15.71 acre tract;
- (11) **Thence**, with the east boundary line of the Dennis B. Schmidt called 15.71 acre tract, a west boundary line of the herein described tract, a west boundary line of said 659.90 acre tract, the following courses and distances:

- a. **N 01° 06' 57" W, 334.66'** (N 00° 14' 12" W, 334.66', record) to a ½" iron rod with red "Matkin Hoover Eng. & Survey" plastic cap set for angle;
  - b. **N 01° 04' 53" W, 290.30'** (N 00° 08' 37" W, 290.63', record) to a ½" iron rod with red "Matkin Hoover Eng. & Survey" plastic cap set for angle at the northeast corner of the Dennis B. Schmidt called 15.71 acre tract, the southeast corner of a called 11.79 acre tract recorded in Document No. 20080379, Official Public Records of Gillespie County, Texas;
- (12) **Thence, N 00° 55' 35" W**, with the east boundary line of the called 11.79 acre tract, a west boundary line of the herein described tract, a west boundary line of said 659.90 acre tract, a **distance of 639.32'** (N 00° 25' 28" W, 639.94', record) to a ½" iron rod with red "Matkin Hoover Eng. & Survey" plastic cap set for angle at the northeast corner of the called 11.79 acre tract, the southeast corner of Lester E. Schmidt called 15.71 acre tract recorded in Volume 167, pages 613-624, Deed Records of Gillespie County, Texas;
- (13) **Thence, N 00° 38' 02" W**, with the east boundary line of the Lester E. Schmidt called 15.71 acre tract, a west boundary line of the herein described tract, a west boundary line of said 659.90 acre tract, di a **distance of 524.36'** (N 00° 46' 13" W, 523.31', record) to a ½" iron rod with red "Matkin Hoover Eng. & Survey" plastic cap set for angle;
- (14) **Thence, N 01° 00' 32" W**, continuing with the east boundary line of the Lester E. Schmidt called 15.71 acre tract, the east boundary line of the Douglas J Schmidt called 15.71 acre tract, a west boundary line of the herein described tract, a west boundary line of said 659.90 acre tract, di di a **distance of 397.80'** (N 00° 15' 20" W, 398.20', record) to the **POINT OF BEGINNING** and containing **659.723 acres** of land, more or less.

Note: The basis of bearing was established using the Trimble VRS Network, NAD (83), Texas State Plane Coordinate System, Central Zone, 4203, US Survey Foot, Grid. A survey plat was prepared by a separate document.



Jeff Boerner      Date: 09-21-2016  
 RPLS #4939  
 Job #16-4116 659.723 ACRES

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028

**FILED AND RECORDED**  
**OFFICIAL PUBLIC RECORDS**

*Mary Lynn Rusche*

Mary Lynn Rusche, County Clerk  
Gillespie County, Texas



September 28, 2016 01:29:24 PM

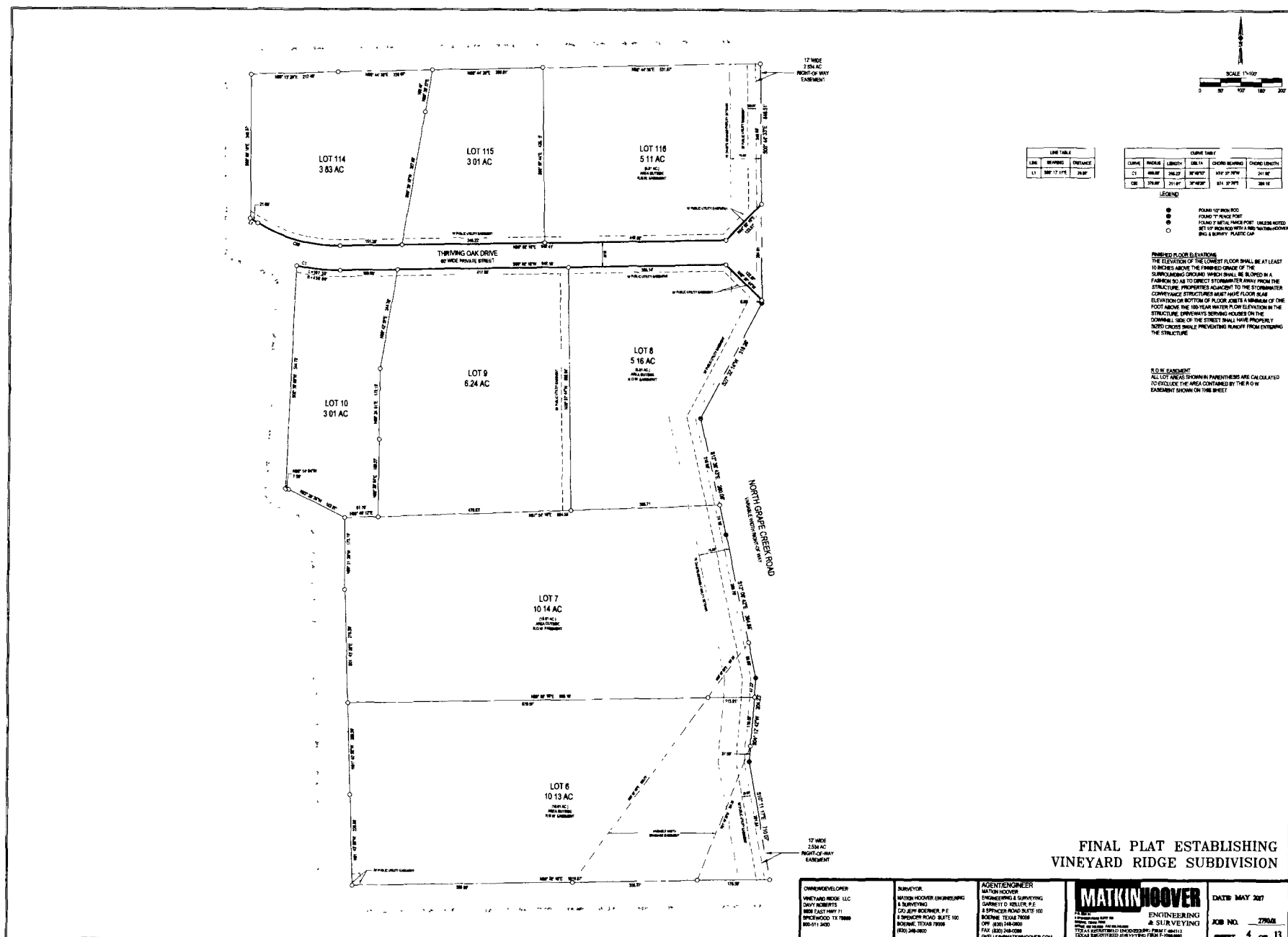
FEE: \$56.00 CCHEESEMAN 20164806  
LD

## **Exhibit “4”**









LINE	BEARING	DISTANCE
11	N 89° 17' 17" E	70.00'

CURVE	ARC LENGTH	CHORD BEARING	CHORD LENGTH
C1	10.00'	N 89° 17' 17" E	20.00'
C2	10.00'	N 89° 17' 17" E	20.00'

# LEGEND

- FOUND 12" IRON ROD
- FOUND 1" IRON POST
- FOUND 1" METAL PAPER POST - UNLESS NOTED
- SET OF IRON ROD WITH A 1/2" DIA. IRON ROD
- SET OF IRON ROD WITH A 1/2" DIA. IRON ROD
- SET OF IRON ROD WITH A 1/2" DIA. IRON ROD

**FINISHED FLOOR ELEVATIONS**  
THE ELEVATION OF THE LOWEST FLOOR SHALL BE AT LEAST 10 INCHES ABOVE THE FINISHED GRADE OF THE SURROUNDING CIRCULAR WHICH SHALL BE BLOWN IN A FAIRWAY SO AS TO DIRECT STORMWATER AWAY FROM THE STRUCTURE. PROPERTIES ADJACENT TO THE STORMWATER CONVEYANCE STRUCTURES MUST HAVE FLOOR SLAB ELEVATION OR BOTTOM OF FLOOR SLAB A MINIMUM OF ONE FOOT ABOVE THE 100-YEAR WATER FLOW ELEVATION IN THE STRUCTURE. DRAINAGE SERVING HOUSES ON THE DOWNHILL SIDE OF THE STREET SHALL HAVE PROPERLY SIZED CHIMNEYS WHILE PREVENTING RUNOFF FROM ENTERING THE STRUCTURE.

**P.O.M. EASEMENT**  
ALL LOT AREAS SHOWN IN PARENTHESES ARE CALCULATED TO EXCLUDE THE AREA CONTAINED BY THE P.O.M. EASEMENT SHOWN ON THIS PLAT.

## FINAL PLAT ESTABLISHING VINEYARD RIDGE SUBDIVISION

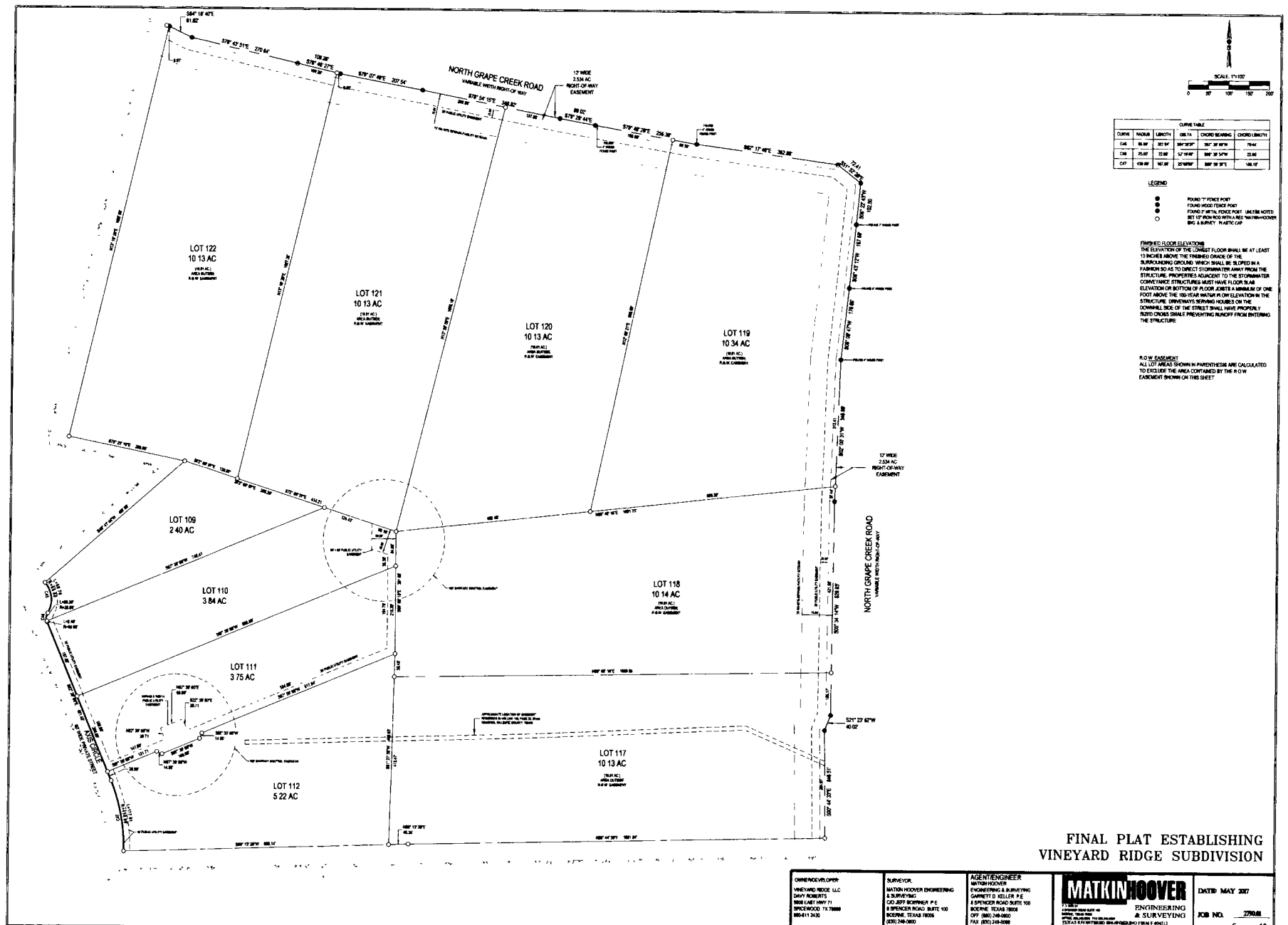
**OWNER/DEVELOPER**  
VINEYARD RIDGE, LLC  
DAVE ROBERTS  
1000 EAST HUNT 71  
BROCKWOOD TX 79808  
800-771-3000

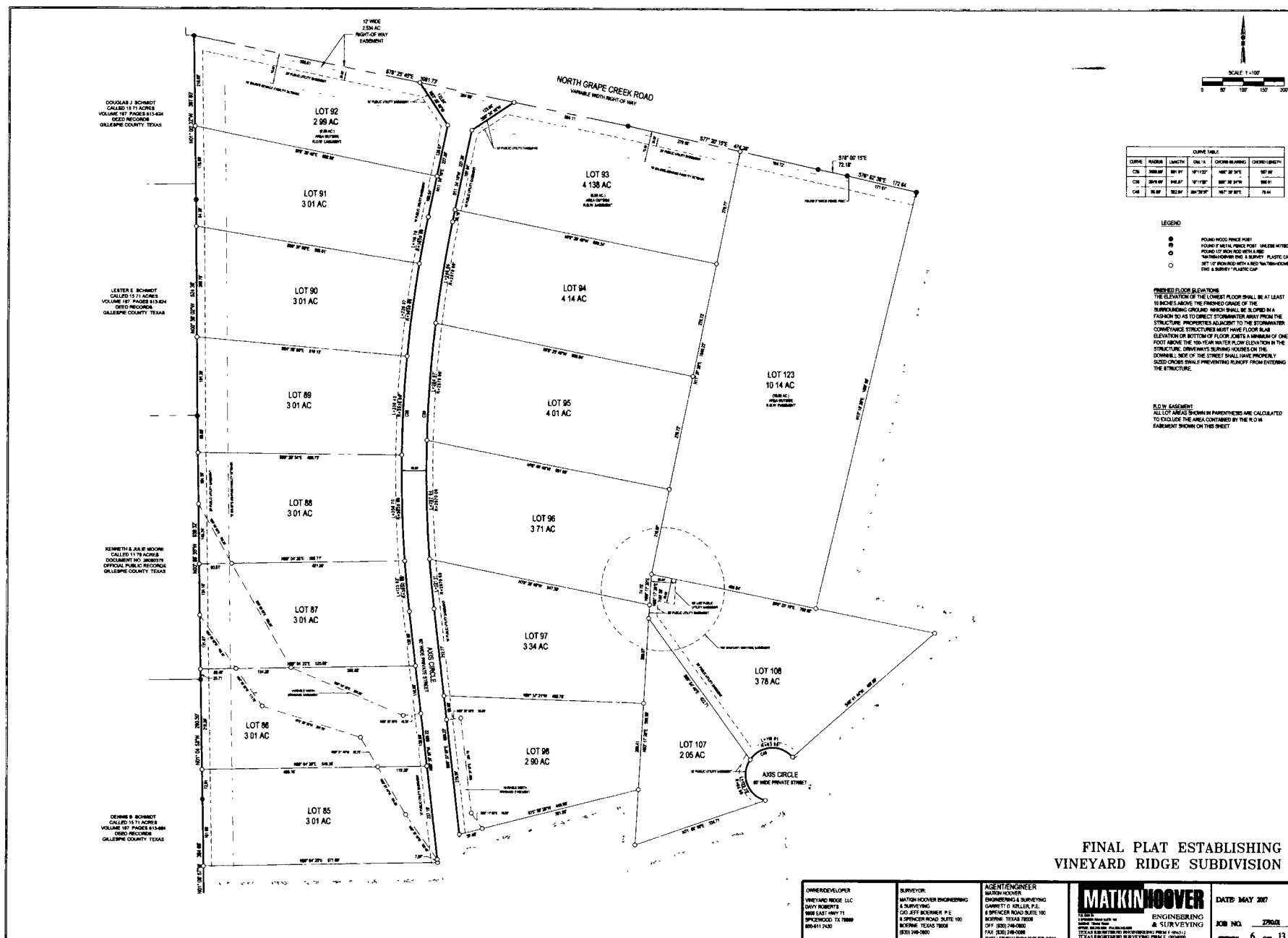
**SURVEYOR**  
MATKIN HOOVER ENGINEERING & SURVEYING  
C/O JEFF ROEMER, P.E.  
8 SPRINGER ROAD SUITE 100  
BOONVILLE TEXAS 79808  
OFF: (820) 248-0800  
FAX: (820) 248-0800  
EMAIL: JHOOVER@MATKINHOOVER.COM

**AGENT/ENGINEER**  
MATKIN HOOVER  
ENGINEERING & SURVEYING  
C/O JEFF ROEMER, P.E.  
8 SPRINGER ROAD SUITE 100  
BOONVILLE TEXAS 79808  
OFF: (820) 248-0800  
FAX: (820) 248-0800  
EMAIL: JHOOVER@MATKINHOOVER.COM

**MATKIN HOOVER**  
ENGINEERING & SURVEYING  
1000 EAST HUNT 71  
BROCKWOOD TX 79808  
OFF: (820) 248-0800  
FAX: (820) 248-0800  
EMAIL: JHOOVER@MATKINHOOVER.COM

**DATE** MAY 2017  
**JOB NO.** 27904  
**SHEET** 4 OF 13





# FINAL PLAT ESTABLISHING VINEYARD RIDGE SUBDIVISION

CURVE DATA			
CURVE	PI	PC	PT
1	1000.00	1000.00	1000.00
2	1000.00	1000.00	1000.00
3	1000.00	1000.00	1000.00
4	1000.00	1000.00	1000.00

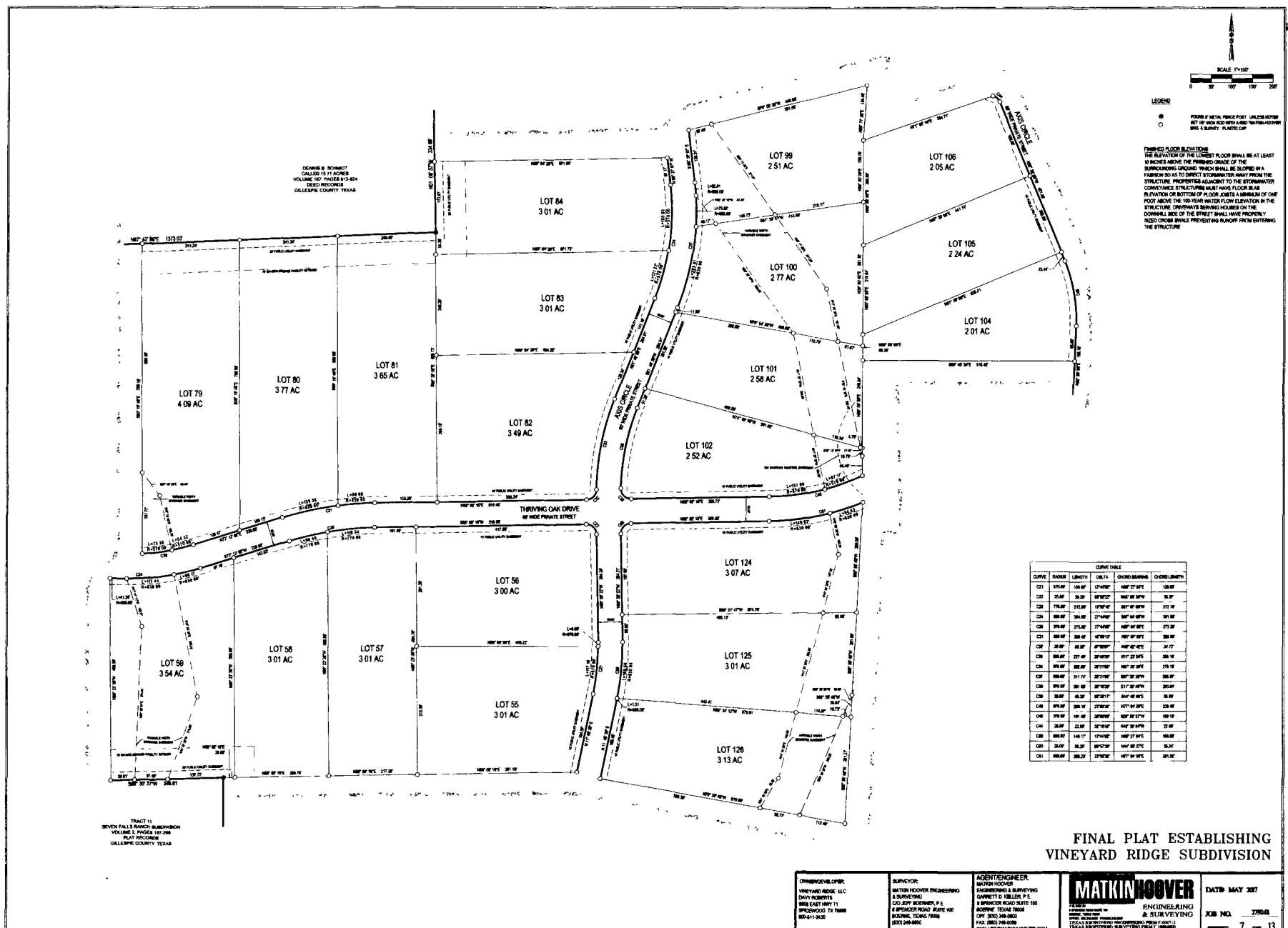
## LEGEND

- POUND WOOD PINE POST
- POUND IRON PINE POST
- POUND IRON ROD WITH A RED THERMOPLASTIC CAP
- SET 1" IRON ROD WITH A RED THERMOPLASTIC CAP
- SET 1" IRON ROD WITH A RED THERMOPLASTIC CAP

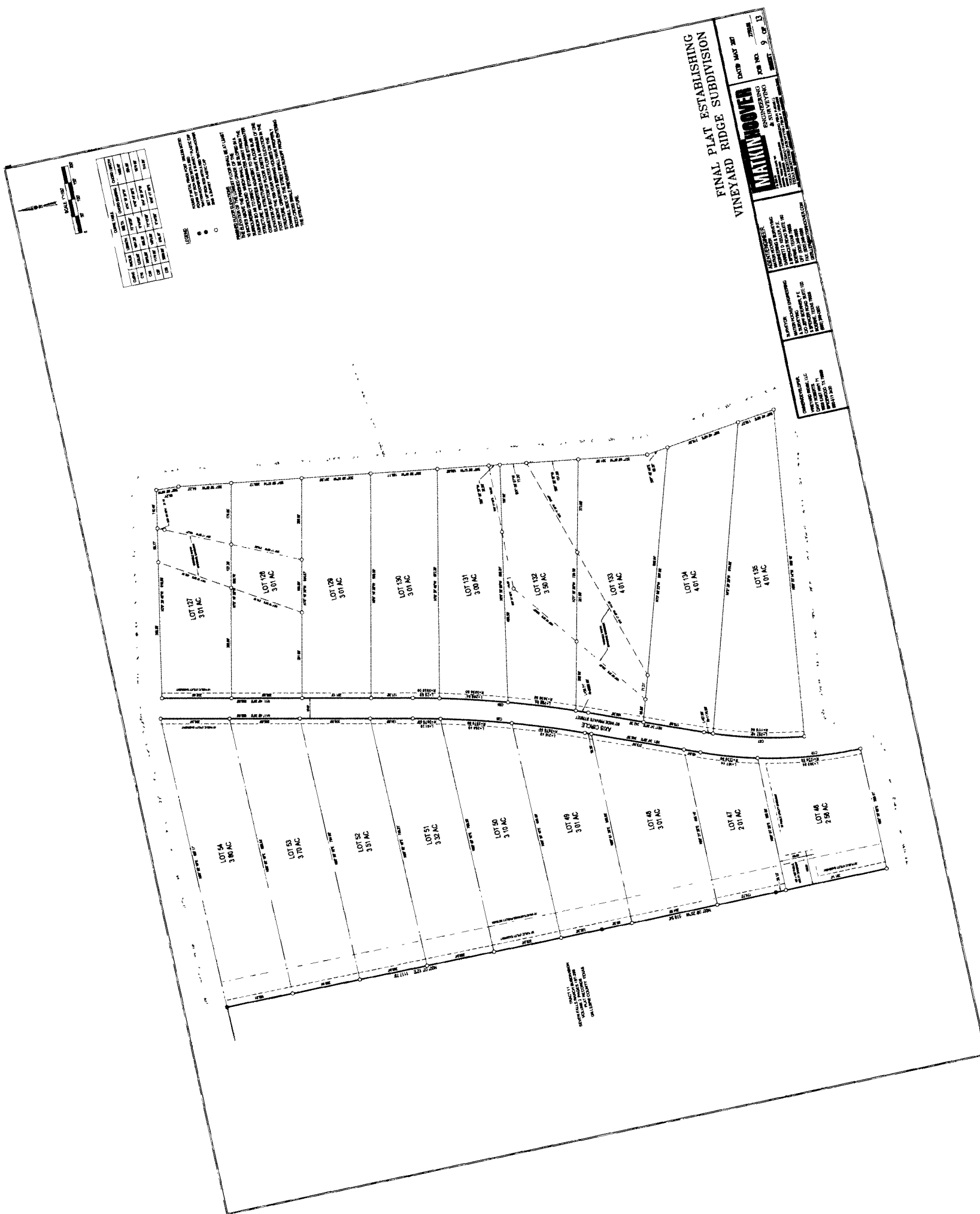
**FINISHED FLOOR ELEVATIONS**  
THE ELEVATION OF THE LOWEST FLOOR SHALL BE AT LEAST 18 INCHES ABOVE THE FINISHED GRADE OF THE SURROUNDING GROUND WHICH SHALL BE SLOPED IN A FASHION SO AS TO DIRECT STORMWATER AWAY FROM THE STRUCTURE. PROPERTIES ADJACENT TO THE STORMWATER CONVEYANCE STRUCTURES MUST HAVE FLOOR SLAB ELEVATION ON BOTTOM OF FLOOR JOISTS A MINIMUM OF ONE FOOT ABOVE THE 100-YEAR WATER PLOW ELEVATION IN THE STRUCTURE. OWNERS SHALL MAINTAIN HOUSES ON THE DOWNHILL SIDE OF THE STREET SHALL HAVE PROPERLY SIZED CURBS SHALL PREVENTING RUNOFF FROM ENTERING THE STRUCTURE.

**R.O.W. EASEMENT**  
ALL LOT AREAS SHOWN IN PARENTHESES ARE CALCULATED TO EXCLUDE THE AREA COVERED BY THE R.O.W. EASEMENT SHOWN ON THIS SHEET.







[illegible][illegible]

FINAL PLAT ESTABLISHING  
VINEYARD RIDGE SUBDIVISION  
DATE MAY 20 1968

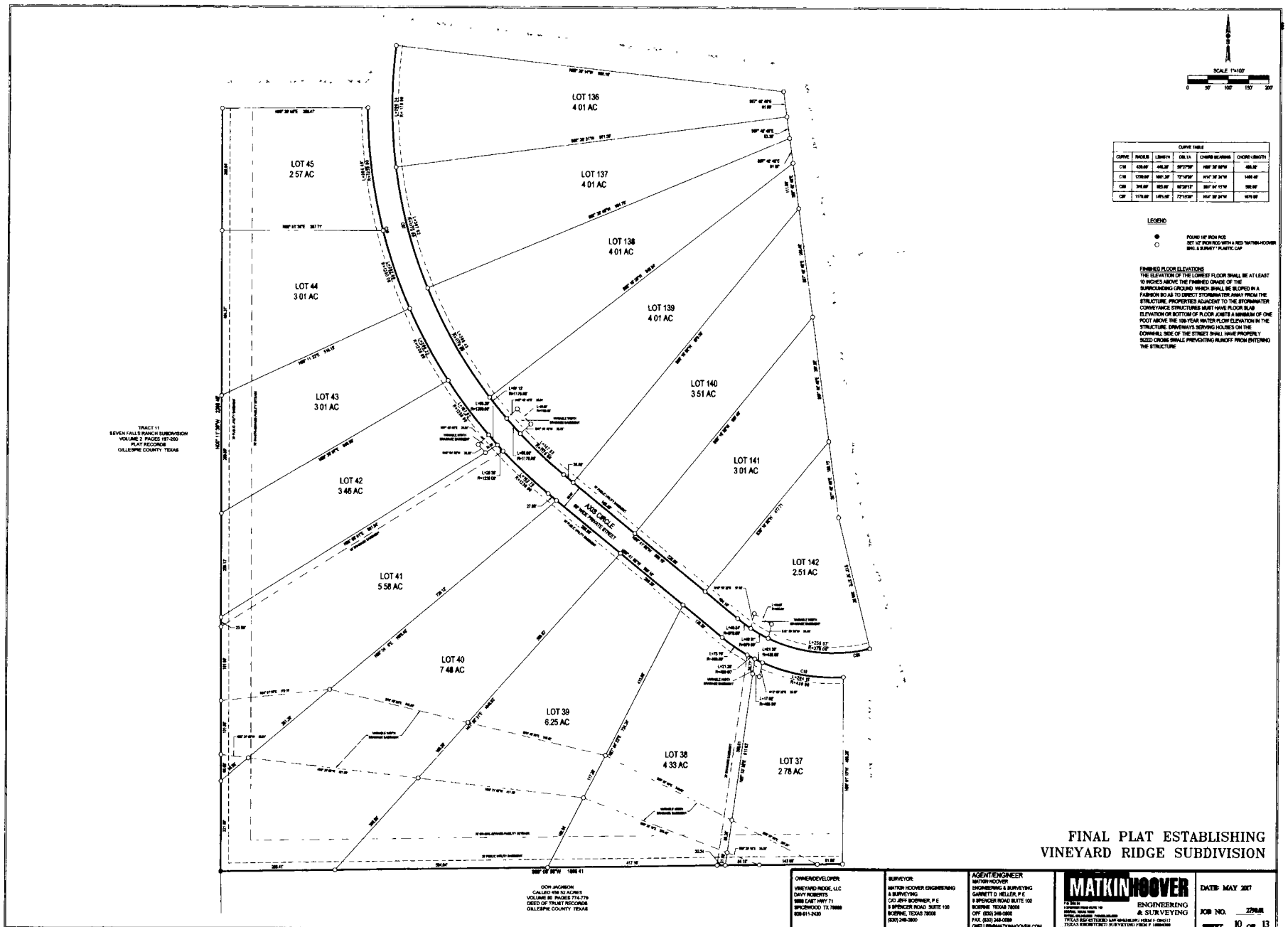
**BREATHING HOVER**

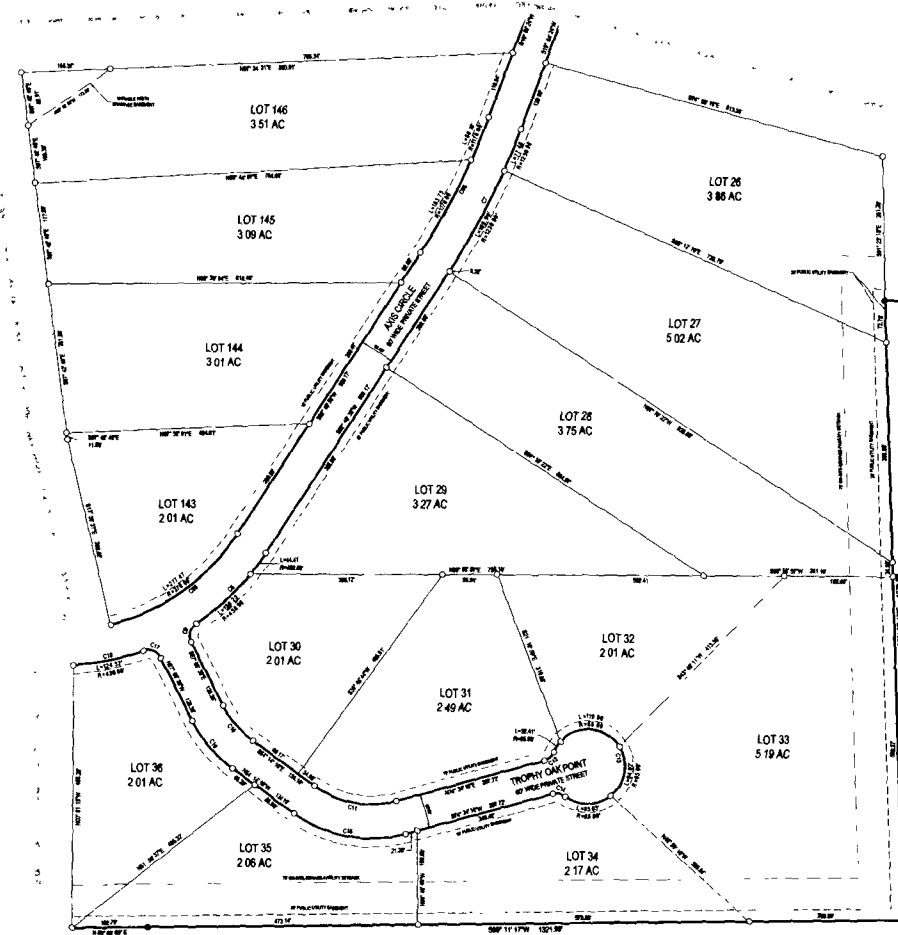
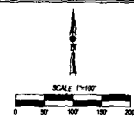
DATE MAY 207  
JOB NO. 9 OF 13  
72000

**ENGINEER**  
 FOR ROOFS & BURNING  
 GREENSBORO, P.E.  
 VINCENT D. KELLEY, INC.  
 10000 W. 10TH AVE. SUITE 100  
 GREENSBORO, NC 27409  
 PHONE: (336) 244-0000  
 FAX: (336) 244-0000  
 WWW.VDKELLEY.COM

**SURVEYOR**  
WATSON MOORE ENGINEERING  
A SURVEYING  
CO. 2000 BOEING, P.E.  
1000 BOEING ROAD SUITE 100  
SPENCER, TEXAS 75085  
(817) 244-0800

CHANDRASEKULAPILLER  
VINEYARD MOBILE, LLC  
DANNY ROBERTS  
1805 EAST HWY 74  
SPRINGWOOD, TX 75782  
800-611-2630





CURVE TABLE				
CURVE	ARC LENGTH	CHORD BEARING	CHORD LENGTH	
C1	173.85'	S 87° 14' 10" W	173.85'	
C2	173.85'	S 87° 14' 10" W	173.85'	
C3	173.85'	S 87° 14' 10" W	173.85'	
C4	173.85'	S 87° 14' 10" W	173.85'	
C5	173.85'	S 87° 14' 10" W	173.85'	
C6	173.85'	S 87° 14' 10" W	173.85'	
C7	173.85'	S 87° 14' 10" W	173.85'	
C8	173.85'	S 87° 14' 10" W	173.85'	
C9	173.85'	S 87° 14' 10" W	173.85'	
C10	173.85'	S 87° 14' 10" W	173.85'	
C11	173.85'	S 87° 14' 10" W	173.85'	
C12	173.85'	S 87° 14' 10" W	173.85'	
C13	173.85'	S 87° 14' 10" W	173.85'	
C14	173.85'	S 87° 14' 10" W	173.85'	
C15	173.85'	S 87° 14' 10" W	173.85'	
C16	173.85'	S 87° 14' 10" W	173.85'	
C17	173.85'	S 87° 14' 10" W	173.85'	
C18	173.85'	S 87° 14' 10" W	173.85'	
C19	173.85'	S 87° 14' 10" W	173.85'	
C20	173.85'	S 87° 14' 10" W	173.85'	

- LEGEND**
- POINT UP FROM ROAD
  - POINT UP FROM ROAD WITH A RED WATERPROOF BINS & SURVEY PLASTIC CAP
  - SET OF POINTS WITH A RED WATERPROOF BINS & SURVEY PLASTIC CAP

**THORNTON OAK POINT**  
 THE ELEVATION OF THE LOWEST FLOOR SHALL BE AT LEAST 18 INCHES ABOVE THE FINISHED GRADE OF THE SURROUNDING CIRCLES WHICH SHALL BE BLOWN IN A PATTERN SO AS TO DIRECT STORMWATER AWAY FROM THE STRUCTURE. PROPERTIES ADJACENT TO THE STORMWATER CONVEYANCE STRUCTURES MUST HAVE FLOOR SLAB ELEVATION ON BOTTOM OF FLOOR JOIST A MINIMUM OF ONE FOOT ABOVE THE 100-YEAR WATER FLOW ELEVATION IN THE STRUCTURE. OVERWATER SERVING HOUSES ON THE CHANNEL, SIDE OF THE STREET SHALL HAVE PROPERLY SIZED CHIMNEYS PREVENTING RAJICRY FROM ENTERING THE STRUCTURE.

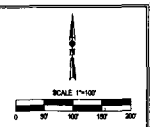
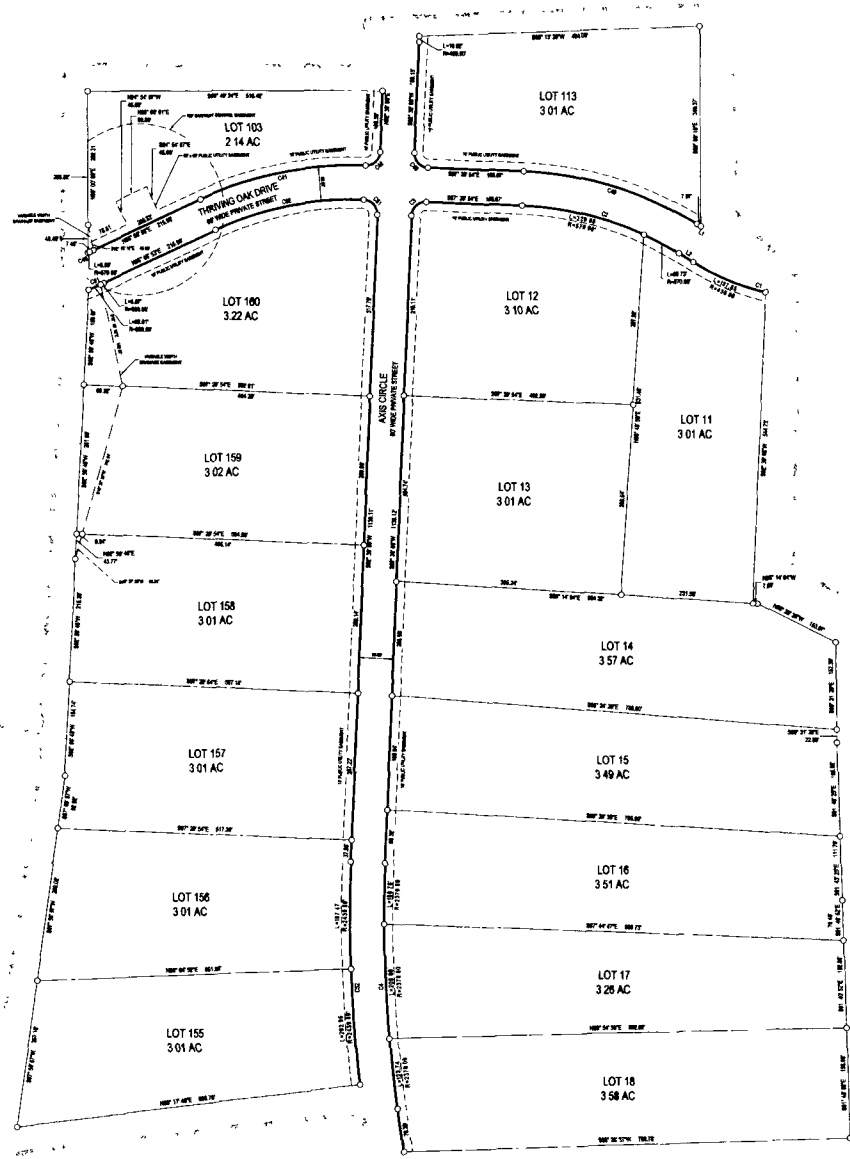
THORNTON OAK POINT  
 CALLED 188.40 ACRES  
 DOCUMENT NO. 2011000  
 OFFICIAL PUBLIC RECORDS  
 COLLIER COUNTY TEXAS

CHAS. JACKSON  
 CALLED 188.40 ACRES  
 VOLUME 96 PAGE 174-175  
 DEED OF TRUST RECORDS  
 COLLIER COUNTY TEXAS

# FINAL PLAT ESTABLISHING VINEYARD RIDGE SUBDIVISION

PROPERTY DEVELOPER VINEYARD RIDGE, LLC GRAY POWERS 1000 EAST 10TH ST BIRMINGHAM, AL 35203	SURVEYOR MATKIN-HOOVER ENGINEERING & SURVEYING 1000 EAST 10TH ST BIRMINGHAM, AL 35203	AGENT/ENGINEER MATKIN-HOOVER ENGINEERING & SURVEYING 1000 EAST 10TH ST BIRMINGHAM, AL 35203	<b>MATKIN-HOOVER</b> ENGINEERING & SURVEYING 1000 EAST 10TH ST BIRMINGHAM, AL 35203	DATE: MAY 2011 JOB NO. 27948 SHEET 11 OF 13
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LINE	BEARING	DISTANCE
L1	S87°17'11"N	38.87
L2	S87°17'11"W	39.87

CURVE	BEARING	DELTA	CHORD BEARING	CHORD LENGTH
C1	S87°17'11"E	30°10'00"	S77°27'30"W	34.30
C2	S87°17'11"E	30°10'00"	S77°27'30"W	34.30
C3	S87°17'11"E	30°10'00"	S77°27'30"W	34.30
C4	S87°17'11"E	30°10'00"	S77°27'30"W	34.30
C5	S87°17'11"E	30°10'00"	S77°27'30"W	34.30
C6	S87°17'11"E	30°10'00"	S77°27'30"W	34.30
C7	S87°17'11"E	30°10'00"	S77°27'30"W	34.30
C8	S87°17'11"E	30°10'00"	S77°27'30"W	34.30
C9	S87°17'11"E	30°10'00"	S77°27'30"W	34.30
C10	S87°17'11"E	30°10'00"	S77°27'30"W	34.30
C11	S87°17'11"E	30°10'00"	S77°27'30"W	34.30
C12	S87°17'11"E	30°10'00"	S77°27'30"W	34.30
C13	S87°17'11"E	30°10'00"	S77°27'30"W	34.30
C14	S87°17'11"E	30°10'00"	S77°27'30"W	34.30
C15	S87°17'11"E	30°10'00"	S77°27'30"W	34.30
C16	S87°17'11"E	30°10'00"	S77°27'30"W	34.30
C17	S87°17'11"E	30°10'00"	S77°27'30"W	34.30
C18	S87°17'11"E	30°10'00"	S77°27'30"W	34.30
C19	S87°17'11"E	30°10'00"	S77°27'30"W	34.30
C20	S87°17'11"E	30°10'00"	S77°27'30"W	34.30

**LEGEND**

SET OF PLOTTED WITH A TWO-WAY ROADWAY  
ONE & SURVEY PLANTER CAP

**FURNISHED FLOOR ELEVATIONS**  
THE ELEVATION OF THE LOWEST FLOOR SHALL BE AT LEAST  
18 INCHES ABOVE THE FINISHED GRADE OF THE  
SURROUNDING GROUND, WHICH SHALL BE DETERMINED BY A  
FABRICATOR TO DIRECT STORMWATER AWAY FROM THE  
STRUCTURE. PROPERTIES ADJACENT TO THE STORMWATER  
CONVEYANCE STRUCTURES MUST HAVE FLOOR SLAB  
ELEVATION ON BOTTOM OF FLOOR, WITH A MINIMUM OF ONE  
FOOT ABOVE THE 100-YEAR FLOOD ELEVATION IN THE  
STRUCTURE. DIMENSIONS SERVING HOUSES ON THE  
DOWNHILL SIDE OF THE STREET SHALL HAVE PROPERLY  
ROAD CROSS SHALL PREVENTING RUNOFF FROM ENTERING  
THE STRUCTURE.

# FINAL PLAT ESTABLISHING VINEYARD RIDGE SUBDIVISION

<b>OWNER/DEVELOPER:</b> VINEYARD RIDGE, LLC DANNY ROBERTS 1000 EAST HWY 11 SPRINGWOOD, TX 76082 800-411-2420	<b>SURVEYOR:</b> MATTHEW HOOVER ENGINEERING & SURVEYING CO. JEFF ROBERTS, P.E. 10000 ROAD SUITE 100 BURNING, TEXAS 76028 800-411-2420	<b>AGENT/ENGINEER:</b> MATTHEW HOOVER ENGINEERING & SURVEYING GARRETT D. KELLER, P.E. 10000 ROAD SUITE 100 BURNING, TEXAS 76028 800-411-2420 CHIEF ENGINEER/MATTHEW HOOVER	<b>MATKIN HOOVER</b> ENGINEERING & SURVEYING 10000 ROAD SUITE 100 BURNING, TEXAS 76028 800-411-2420 CHIEF ENGINEER/MATTHEW HOOVER	<b>DATE:</b> MAY 2017 <b>JOB NO.:</b> 22500 <b>SHEET:</b> 13 OF 13
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## **Exhibit “5”**



WATER CODE  
 TITLE 2. WATER ADMINISTRATION  
 SUBTITLE E. GROUNDWATER MANAGEMENT  
 CHAPTER 35. GROUNDWATER STUDIES

**Sec. 35.019. WATER AVAILABILITY.** (a) The commissioners court of a county in a priority groundwater management area may adopt water availability requirements in an area where platting is required if the court determines that the requirements are necessary to prevent current or projected water use in the county from exceeding the safe sustainable yield of the county's water supply.

(b) The commissioners court of a county in a priority groundwater management area may:

(1) require a person seeking approval of a plat required by Subchapter A, Chapter 232, Local Government Code, to show:

(A) compliance with the water availability requirements adopted by the court under this section; and

(B) that an adequate supply of water of sufficient quantity and quality is available to supply the number of lots proposed for the platted area;

(2) adopt standards or formulas to determine whether an adequate water supply exists for the platted area; and

(3) adopt procedures for submitting the information necessary to determine whether an adequate water supply exists for the platted area.

(c) The water availability requirements established by a commissioners court under this section may require that:

(1) a person seeking approval of a plat or attempting to sell a lot in a subdivision:

(A) notify a purchaser of a lot in the subdivision if an approved water supply for the subdivision does not exist; or

(B) if the person attempts to build a water supply system to serve one or more lots within the subdivision:

(i) comply with federal, state, and local law; and

(ii) establish an entity to construct and operate the system; or

(2) a planned or operating water supply system serving one or more lots within a subdivision be built and operated in compliance with federal, state, and local laws and rules related to public drinking water.

Added by Acts 1997, 75th Leg., ch. 1010, Sec. 4.19, eff. Sept. 1, 1997.

## **Exhibit “6”**

# **SUBDIVISION REGULATIONS**

**for**

# **GILLESPIE COUNTY, TEXAS**

**August 25, 2003**

**County of Gillespie**  
**Subdivision Regulations**  
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## **SECTION H. WATER AVAILABILITY REQUIREMENTS**

**1. General:** Gillespie County has been designated by the State of Texas as a County within a Priority Groundwater Management Area. Therefore, pursuant to Chapter 35, Section 35.019, Texas Water Code, the Gillespie County Commissioners Court has the authority to require any person seeking subdivision plat approval to show:

- a. Compliance with Water Availability Requirements adopted by the Commissioners Court.
- b. That an adequate supply of water of sufficient quantity and quality is available to supply the number of lots proposed for the platted area.

**2. Water Availability Requirements:** Before any subdivision plat is approved, the developer must establish to the reasonable satisfaction of the Commissioners Court that an adequate quantity and quality of groundwater, or water from surface water sources which meet the standards established by the TCEQ, exists to support the development and occupation of the subdivision. The Hill Country Underground Water Conservation District (HCUWCD) shall oversee the implementation of this Section, and may, if sufficient data is readily available, make recommendations to the Commissioners Court to waive any of the requirements in this Section H. Any person fulfilling the requirement set forth below shall be deemed to have satisfied these Water Availability Requirements. Failure to satisfy these requirements shall result in the rejection of a subdivision plat.

### **3. Public or Community Water Systems:**

- a. **New Public or Community Water System:** If the person requesting plat approval proposes to utilize a new public or community water system, such system shall be developed in accordance with Subchapter C, Chapter 341, Texas Health and Safety Code and as defined by current rules and regulation of the TCEQ 30 TAC Chapter 290. If the public or community water system will have more than fifteen (15) connections, the developer shall present documentation to the Commissioners Court showing that the requirements as specified in Section 4 of these Water Availability Requirements have been met and approved by the HCUWCD. In addition a letter or other document from TCEQ's Rate Analysis and Plan Review Team, Water Utilities Division, shall be supplied approving the business plan and the plans and specifications of the proposed water system. If the proposed water system will have fewer than fifteen (15) connections, the developer shall present a letter from the HCUWCD stating that the HCUWCD has reviewed the plans and specifications for the proposed system, along with any technical data required in subsection 4 of these Water Availability Requirements and finds the proposed system adequate for its intended use.
- b. **Expansion of an Existing Public or Community Water System:** If the developer proposes to utilize an existing public or community water system, the

developer shall present to the Commissioners Court in satisfaction of these requirements a copy of the executed agreement between the developer and the owner of such existing system for such water. If the total number of connections served by the community water system as defined above is more than fifteen (15), including the additional lots, the developer shall present a letter from TCEQ's Rate Analysis and Plan Review Team, Water Utilities Division, stating that the existing water system has sufficient capacity to service the additional connections. In addition the developer shall present to the Commissioners Court documentation that has been approved by the HCUWCD which shows that subsection 4 of these Water Availability Requirements have been met. If the proposed water system will have fewer than fifteen (15) connections, the developer shall present a letter from the HCUWCD stating that the HCUWCD has reviewed the plans and specifications for the proposed system, along with any technical data required in subsection 4 of these Water Availability Requirements and finds the proposed system adequate for its intended use.

c. **Individual Wells Prohibited:** All subdivision plats which satisfy the Water Availability Requirements by utilizing a new or existing public or community water system shall, by deed restriction or other legal means, prohibit the drilling or use of individual wells within such subdivision. Such prohibition shall be prominently noted on the recorded plat. Any existing wells not owned and utilized by the public or community water system shall be plugged in accordance with the applicable rules and regulations of the Water Well Drillers Board and the HCUWCD.

**4. Water Availability Certification:** If the developer proposes groundwater as the primary source of water for the tracts in a subdivision, whether by individual private or community wells, the following requirements shall be met:

- a. **Projected Water Demand Estimate** as specified in TCEQ Groundwater Availability Certification of Platting Ch. 230.6.
- b. **General Groundwater Resource Information** as specified in TCEQ Ch. 230.7.
- c. **Aquifer Testing** as specified in TCEQ Ch. 230.2(2): Aquifer testing is a test involving the withdrawal of measured quantities of water from or addition of water to a well and the measurement of resulting changes in water level in the aquifer both during and after the period of discharge or addition for the purpose of determining the characteristics of the aquifer. Bail and slug tests are not considered to be aquifer tests. The required aquifer testing parameters shall be as specified in TCEQ Ch. 230.8 Obtaining Site-Specific Groundwater Data.
- d. **Determination of Groundwater Quality** as specified in TCEQ Ch. 230.9.
- e. **Determination of Groundwater Availability** as specified in TCEQ Ch. 230.10.

**f. Sufficiency of Water and Certification.** In addition to the test results required above, submit to the Commissioners Court a certificate from a registered professional engineer licensed by the State of Texas or a licensed professional geoscientist. Said certificate shall be based on the pump test results and any other information available, which information shall be detailed, and shall state the opinion of the certifier that sufficient groundwater exists beneath such subdivision of a quantity and quality adequate for the use of the persons purchasing tracts in such subdivision. In addition, a letter is required from the HCUWCD that based on the pump tests results and other information available to the HCUWCD the development after full build-out will not cause an aquifer mining condition to exist. Specifically, sufficient quantity of groundwater is defined as meeting or exceeding a sustainable well production capacity of ten (10) gallons per minute per lot after full build-out. In areas where ten (10) gallons per minute per lot is marginal, additional aquifer test may be required. For those areas where well production capacity is less than ten (10) gallons per minute, lot sizes shall be adjusted accordingly. The developer shall provide to each purchaser or potential purchaser of a tract located in such subdivision a summary of the water quality and quantity test results prior to concluding the sale of any tract. If the developer is unable to obtain the certificate that water of sufficient quantity and quality exists or the Commissioners Court receives a letter from the HCUWCD reporting that sufficient water is not available, the Commissioners Court shall deny that specific plat request.

**g. Groundwater Availability Determination Conditions as specified in TCEQ Ch. 230.11 (b).** The assumptions and uncertainties that are inherent in the determination of groundwater availability should be clearly identified. These conditions must be identified to adequately define the bases for the availability and usability statements. These bases may include, but are not limited to uncontrollable and unknown factors such as:

- (1) 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 would affect the storage of water in the aquifer.
- (2) Long-term impacts to the aquifer based on climatic variations.
- (3) Future impacts to usable groundwater due to unforeseen or unpredictable contamination.

## **Exhibit “7”**



## HILL COUNTRY UNDERGROUND WATER CONSERVATION DISTRICT

---

October 6, 2016

The Honorable Mark Stroehrer  
County Judge  
County of Gillespie  
101 W. Main, Unit #9  
Fredericksburg, Texas 78624

Dear Judge Stroehrer:

This letter is sent in regard to the water availability study undertaken by Wet Rock Groundwater Services, LLC for Lone Star Land Partners, LLC for the proposed Vineyard Ridge Subdivision, located along North Grape Creek Road, Gillespie County.

The study was undertaken to satisfy the requirements of the Certification of Groundwater Availability for Platting Subdivision Form C (Title 30, Texas Administrative Code, Chapter 230, Sections 230.2 through and including 230.11). A complete copy of the study is available at the Hill Country Underground Water Conservation District's office.

### *Local Settings*

The proposed subdivision is located on approximately 655 acres in eastern Gillespie County on North Grape Creek Road. The development will consist of 160 single family residential lots, with an average lot size of 4.2 acres. The aquifer in the area is the Ellenburger and provides water mainly for domestic and livestock demands with some irrigation occurring approximately one mile from the center of the property.

### *Proposed Development*

The proposed subdivision is projected to use approximately 44 acre feet of water per year. This will be supplied by a public water supply well which will be pumped at 50 gpm for approximately 13 hours per day. It is proposed to have two public water supply wells, with the second well to serve as system redundancy and to meet the minimum of 0.6 gpm per connection well capacity, as per TCEQ requirements.

### *Pump Test*

Currently there are three existing wells on the property. One located at the main house, a windmill located approximately 300' to the northwest of the house well, and a shed well located approximately 1500' to the west of the house well.

508 South Washington \* Fredericksburg, TX 78624

Phone: (830) 997-4472 \* Fax: (830) 997-6721

Email Address: [hcuwcd@austin.rr.com](mailto:hcuwcd@austin.rr.com)

Website: [www.hcuwcd.org](http://www.hcuwcd.org)

Page 2  
October 6, 2016

A pump test was conducted on the house well, with the well pumped at approximately 52 gpm for 36 hours. The shed well was used as a monitor well during the test. A drawdown of approximately 92' occurred in the pumping well, but was generally maintained and stable during the 36 hour test. The shed well showed no drawdown, and instead actually gained one foot during this interval. A copy of the hydrograph of the pump test is attached, which shows the drawdown of the pumping well. One interesting feature of the test is the 5' additional drawdown of the water level in the pumping well at the end of the test. This was noted to the consultant, who thought potential causes for the drawdown could have been some adjacent pumping from another well, or some aquifer boundary condition had been encountered. It would have been interesting to have seen what would have occurred had an additional 12 hours of pumping had been added to the test.

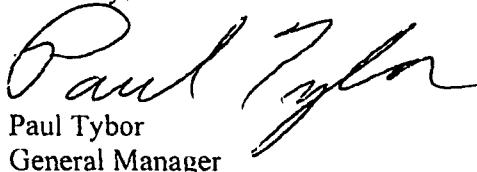
Based on the results of the pumping test, projections of drawdown at distances from the pumping center were made. The attached chart, titled "Distance from Center of Pumping" provides drawdown for 10 years and 30 years. As an example, one mile from this pumping center, in 10 years there will be approximately 17' of drawdown, while in 30 years there will be approximately 19' of drawdown. This would be based on the well being pumped at 50 gpm for about 13 hours per day.

*District Recommendations*

The District's Board of Directors met on October 4, 2016 at its regular board meeting and the results of the study was discussed. The Board decided to concur with the conclusions of the consultants (Wet Rock Groundwater Services, LLC) that adequate groundwater supplies are available for the proposed development by Lone Star Land Partners, LLC.

Should you or any of the Commissioners have any questions concerning the water availability study for this proposed residential development, please do not hesitate to contact me.

Sincerely,

  
Paul Tybor  
General Manager

PT/mr  
Encl.

cc: Alton Klier, Chairman – Hill Country Underground Water Conservation District  
Lone Star Land Partners, LLC  
Bryan Boyd – Wet Rock Groundwater Services, LLC

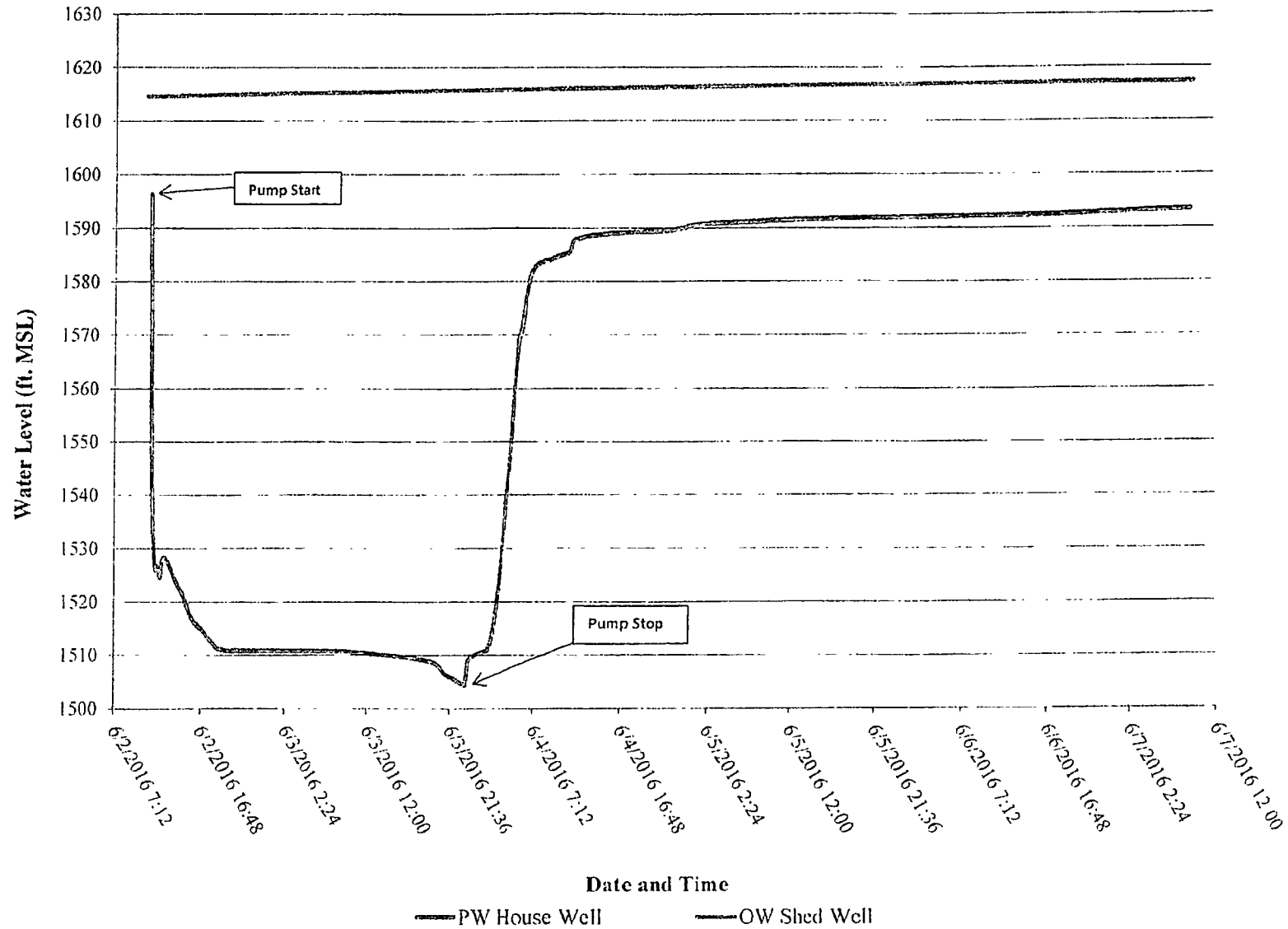


Figure 9: Aquifer test hydrograph of the House Well and Shed Well (June 2, 2016)



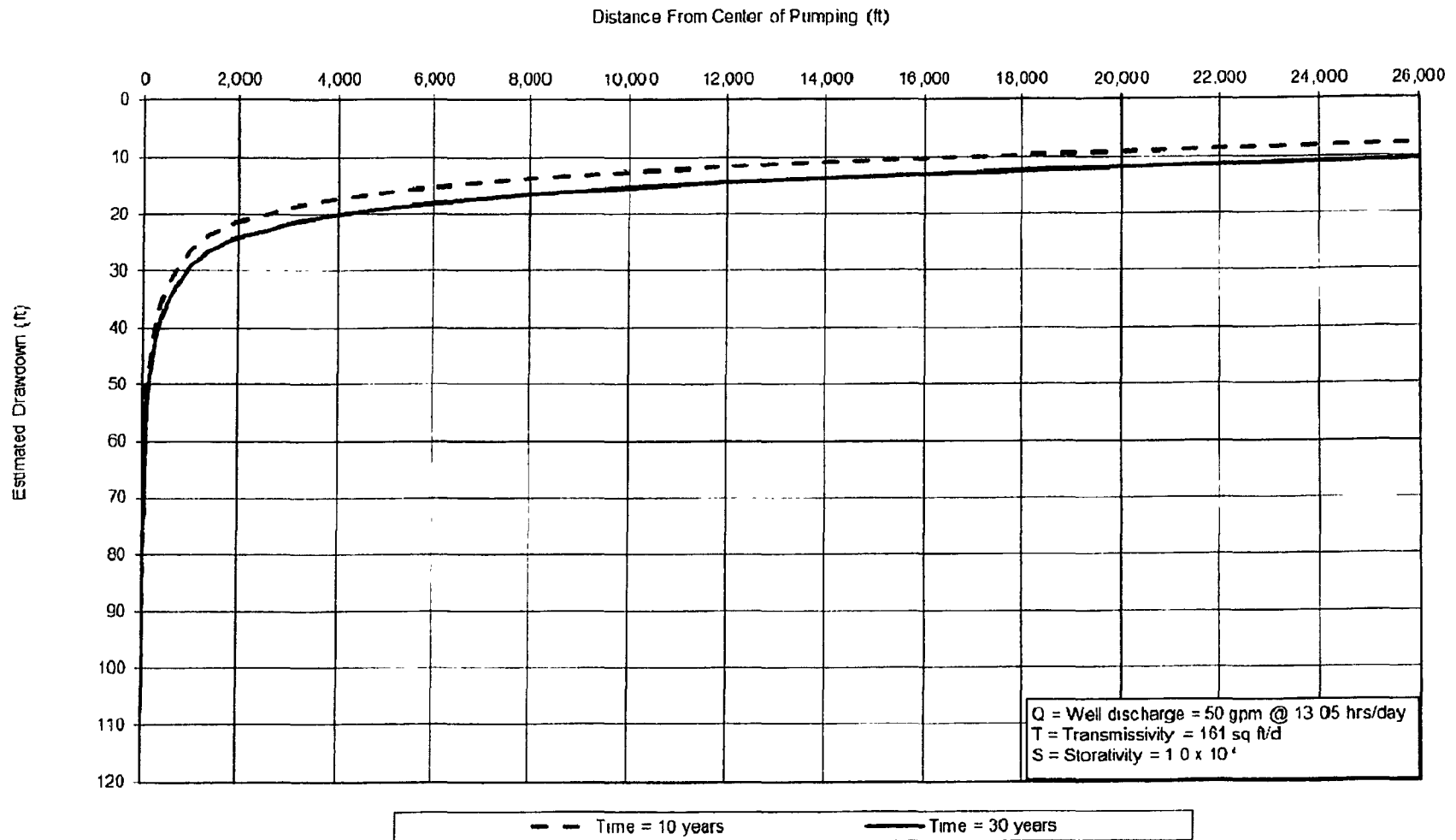


Figure 10: Distance drawdown plot for a single well within the Vineyard Ridge Subdivision



## **Exhibit “8”**

## Report of Findings

# Vineyard Ridge Subdivision Groundwater Availability Certification for Platting: Gillespie County, Texas

For:

Lone Star Land Partners, LLC

9508 E Hwy 71

Spicewood, 78669

Report of Findings: WRGS 16-011



Wet Rock Groundwater Services, L.L.C.

Groundwater Specialists

TBPG Firm No: 50038

317 Ranch Road 620 South, Suite 203

Austin, TX 78734 Ph: 512.773.3226

[www.wetrockgs.com](http://www.wetrockgs.com)



REPORT OF FINDINGS

WRGS 16-011

**Vineyard Ridge Subdivision Groundwater Availability  
Certification for Platting:  
Gillespie County, Texas**

*for*

Lone Star Land Partners  
9508 E. Hwy 71  
Spicewood, TX 78669

Gillespie County, Texas  
September 2016

WRGS Project No. 083-001-16



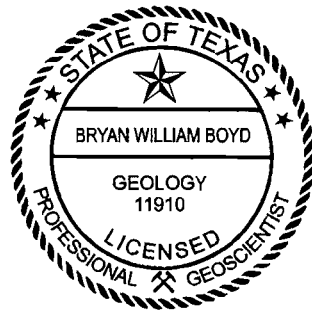
**Wet Rock Groundwater Services, L.L.C.**  
*Groundwater Specialists*

317 Ranch Road 620 South, Suite 203  
Austin, Texas 78734

Phone: 512-773-3226 • [www.wetrockgs.com](http://www.wetrockgs.com)  
TBPB Firm No: 50038



The seal appearing on this document was authorized by Bryan W. Boyd, P.G. 11910 on September 20, 2016:



A handwritten signature in black ink, appearing to read "B. Boyd", written over a horizontal line.

Bryan Boyd, P.G.

License No. 11910

Wet Rock Groundwater Services, LLC

TBPG Firm Registration No. 50038





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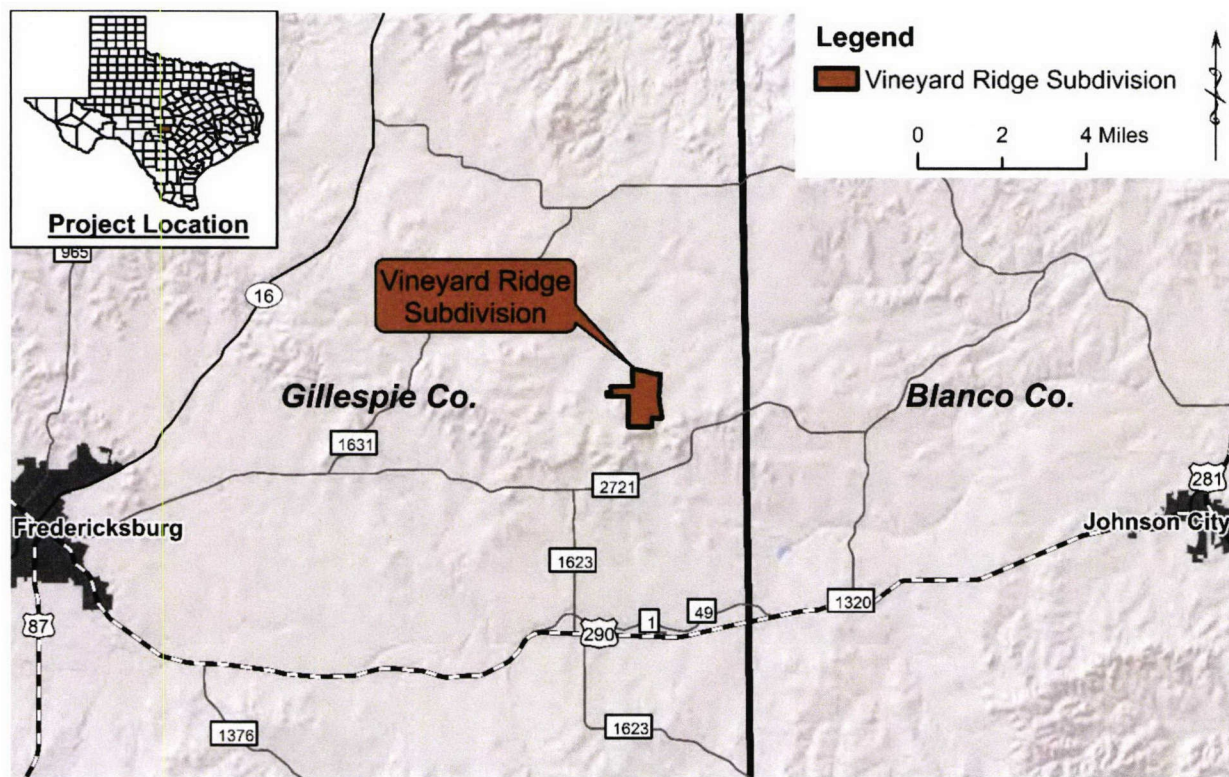
Appendix F: Distance Drawdown Assumptions



## **Section I: Introduction**

This report details the results of a groundwater availability study of the proposed Vineyard Ridge Subdivision (VRS) 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 VRS property is located along North Grape Creek road, approximately 14 miles northeast of the City of Fredericksburg in eastern Gillespie County (Figure 1). The proposed VRS property is documented within the Gillespie County Tax Assessor under Volume: P-7215 and Property IDs: 23133, 23134, 23135, 23136, 23138, 23140, and 23143. Lone Star Land Partners (9508 East Highway 71, Spicewood, TX 78669) is in the process of purchasing the property and is the plat applicant.



**Figure 1: Location map**

The VRS property is approximately 665 acres of native pastureland located on North Grape Creek Road. Lone Star Land Partners (LSLP) proposes to develop the property as a subdivision including 160 single family residential lots. The average lot size is 4.2 acres which will be served by a centralized Public Water System (PWS). The PWS will utilize wells located within Gillespie County which is under the jurisdiction of the Hill Country Underground Water Conservation District (HCUWCD). Figure 2 provides a map showing the general location of the property with the county and groundwater district boundaries.



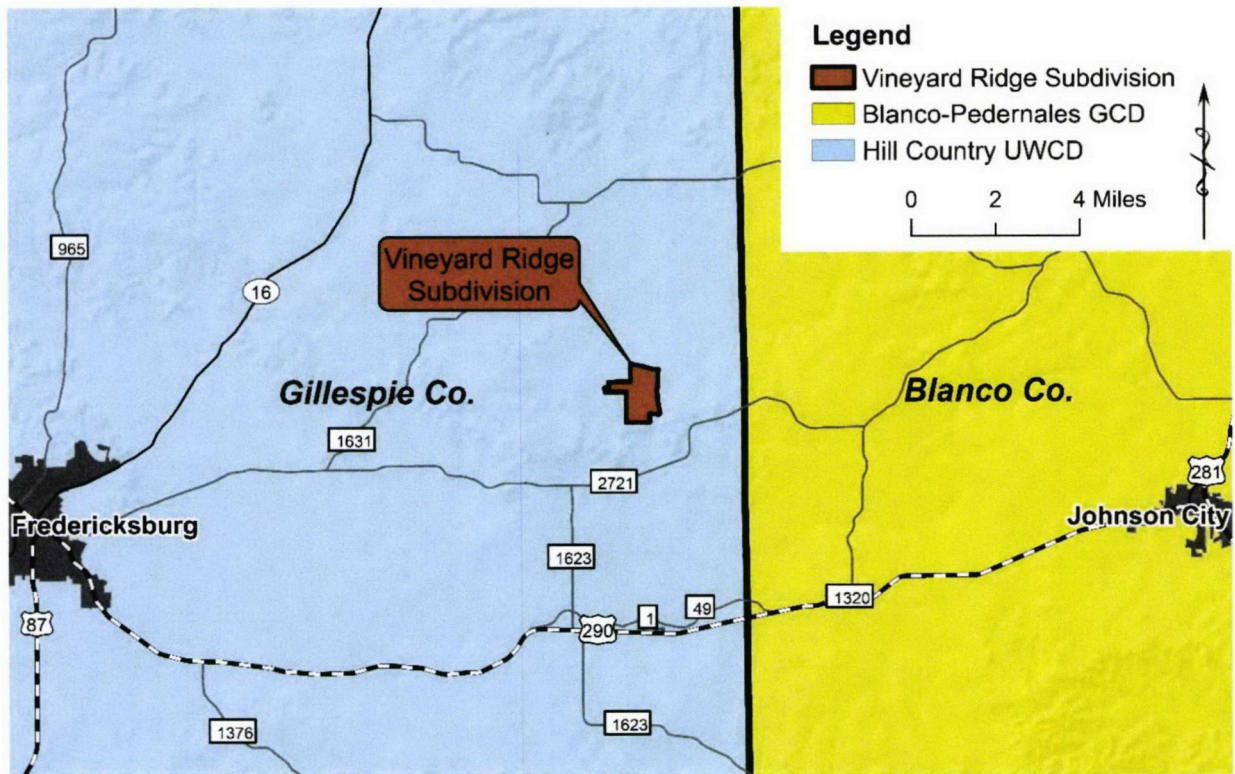


Figure 2: Groundwater Conservation District map





## **Section II: Projected Water Demand Estimate**

Based on discussions with HCUWCD, the average number of people per household (2.75) and per capita water usage (89 gallons/day) was used to estimate the total water demand for the subdivision. The following formula was utilized when calculating water demand for the VRS property:

### **Equation 1: Total Water Demand**

$$Q_s = n \times 2.75 \times 89 \times 365 \text{ days} = 14,293,400 \text{ gallons/year or } 43.86 \text{ acre-feet/year}$$

Where:

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

$n$  = Number of connections (160 lots);

2.75 = Average number of persons per household; and

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

### **Equation 2: Water Demand per Housing Unit**

$$Q_h = 2.75 \times 89 \times 365 \text{ days} = 89,334 \text{ gallons/year or } 0.27 \text{ acre-feet/year}$$

Where:

$Q_h$  = Total Water Demand per house per year

Equation 1 assumes 2.75 persons per household using 89 gallons per person per day which results in a total water demand for the subdivision of 43.86 acre-feet/year. Equation 2 results in a water demand per housing unit of 0.27 acre-feet/year. There are no planned non-residential water demands.



### **Section III: General Groundwater Resource Information**

#### **III.1. Introduction**

There are both minor and major aquifers that underlie Gillespie County and are utilized as groundwater resources. The Cretaceous aged Trinity Aquifer and the Edwards-Trinity Aquifer are the major aquifers present in Gillespie County. In addition to the major aquifers, the Cambrian aged Hickory Aquifer and the Cambrian and Ordovician aged Ellenburger-San Saba Aquifer are minor aquifers within the county. The Texas Water Development Board (TWDB) classifies major aquifers as aquifers that produce large amounts of water over large areas, and minor aquifers as aquifers that produce minor amounts of water over large areas or large amounts of water over small areas. The aquifers of Gillespie County are affected by geologic structures which include the regional dip, the Llano uplift, the San Marcos Arch, the Balcones fault system, and the uneven pre-Cretaceous surface (Ashworth, 1983).

#### **III.2. Stratigraphy and Geologic History**

The VRS property is located in the southern portion of the Llano Uplift. The uplift is a structural high dome consisting of Precambrian rock, much of which are igneous granites and other metamorphics aging up to over 1.36 billion years (Reese et. al, 2000). Metamorphosis including compression and folding occurred approximately 1.2 billion years ago with multi-directional fracturing (Johnson, 2004). Figure 3 provides a geologic map and stratigraphic column illustrating the northeast trending faults to the north and the diverse geology surrounding the proposed VRS property.

The complex Precambrian formations which make up the structural base in the study area are composed of a sequence of meta-sedimentary and meta-igneous rock, with scattered intrusive igneous rock. Major meta-sedimentary units include the Packsaddle Schist and the Valley Spring Gneiss; meta-igneous units include the Coal Creek Serpentine, the Big Spring Gneiss, and the Red Mountain Gneiss. Igneous rocks include the Llanite Quartz Porphyry, the Sixmile Granite, the Oatman Creek Granite, and the Town Mountain Granite (Figure 3; Preston et. al, 1996). In general, these rocks crop out in the center of the uplift and act as confining units to overlying aquifers. Rocks overlying the Precambrian Base dip radially away from the dome structure with high variability in magnitude, ranging from a few feet (ft.) to over 100 ft. per mile (Barnes and Bell, 1977).

Stratigraphically above the Precambrian base 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 crossbedded 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).

Overlying 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 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 Edwards Group, which consists of the Fort Terrett and Segovia Formations (collectively known as Edwards Limestone).

At the VRS property, the Upper Member of the Glen Rose Formation is present at the surface over the majority of the property with the Fort Terrett Formation of the Edwards Group present in the southwest corner (Figure 3). A small outcropping of the Staendebach Member of the Tanyard Formation (Ellenburger Group) is also present on the property (Figure 3). While there are no known faults present at the VRS property, a series of normal faults trending in southwest-northeast direction are present to the north and northeast (Figure 3). The faults have juxtaposed rocks against one another, resulting in the discontinuous geologic makeup of the area.





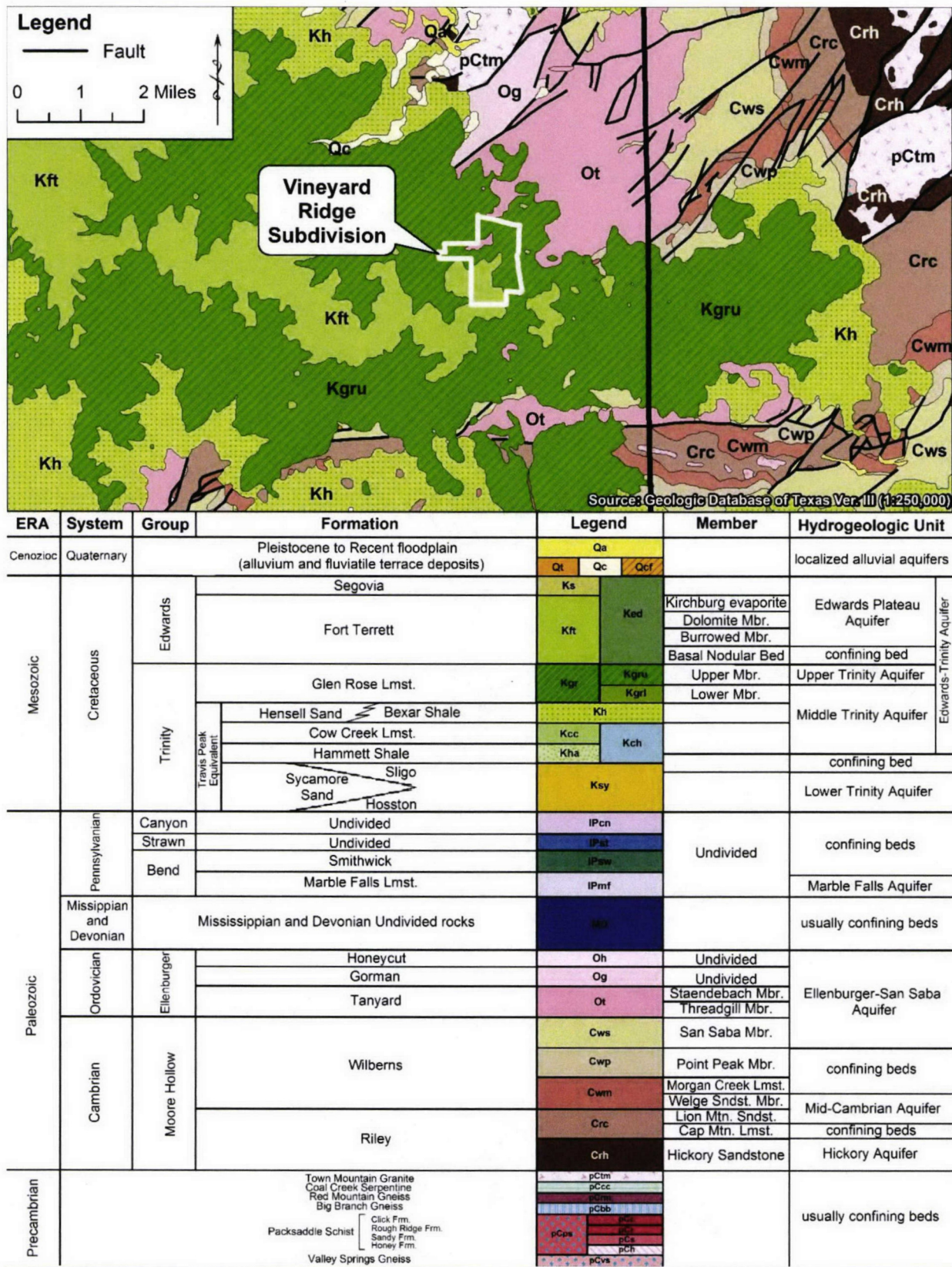


Figure 3: Geologic map and stratigraphic column (modified from McGeehee, 1979; Preston et. al, 1996)



### III.3. Hydrogeology

The Ouachita Orogeny during the late Paleozoic had a significant impact on the structure of the Llano Uplift, deforming the existing land surface and causing a series of faults to develop. This faulting caused some of the rock formations to become abutted against others, resulting in compartmentalized regional aquifers with varying connectivity (Bluntzer, 1992). Figure 4 provides an aquifer map of the area near the VRS property.

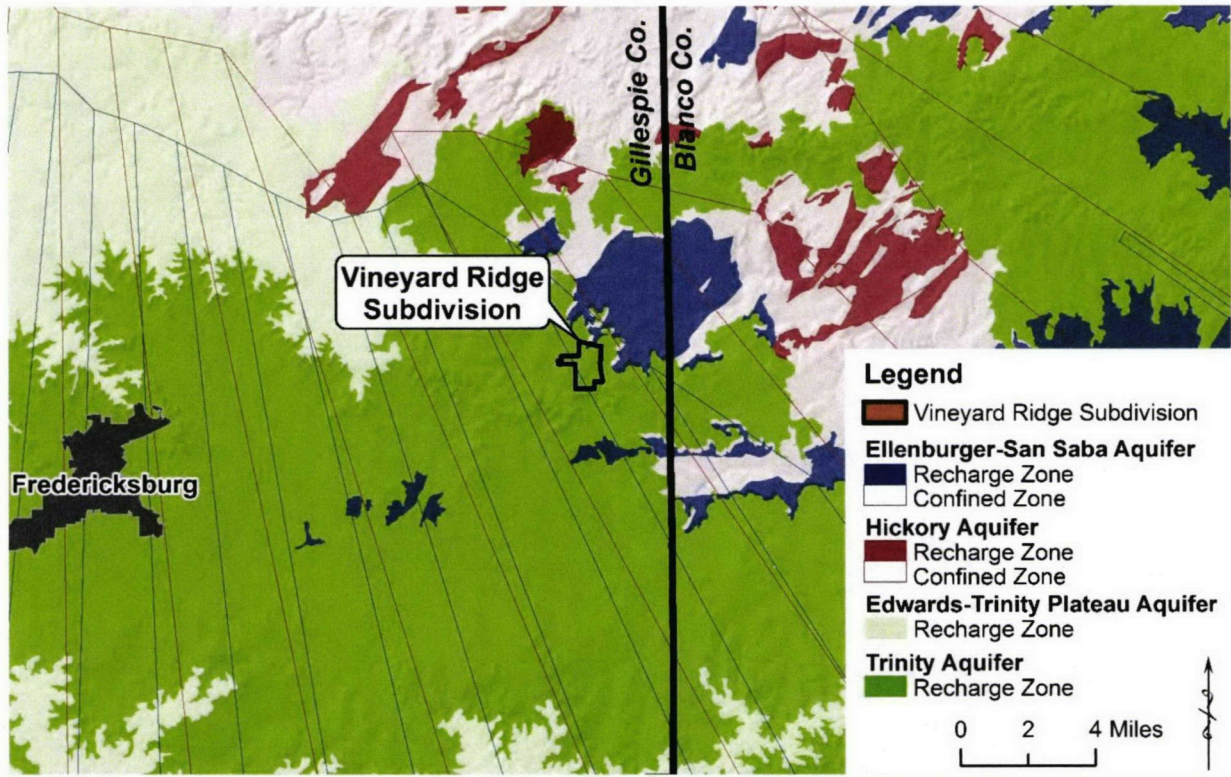


Figure 4: Aquifer map

The dolostones and limestones of the Ellenburger-San Saba aquifer and the sandstones of the Hickory Aquifer generally encircle the Llano Uplift extending radially outward from the uplift (Figure 4). The aquifers dip downwards away from the center of the uplift and can range in thickness from 0 up to 3,000 feet (ft). Faults have caused portions of aquifers to become compartmentalized which restricts groundwater flow in some areas and increased production in other portions of the aquifer. Restricted flow or communication within an aquifer can result in wells that will produce varying amounts of water within a relatively small distance. Within the Ellenburger-San Saba Aquifer the well production is dependent upon fractures, with the greatest producers generally intersecting solution cavities formed along fractures. These cavities are most often found in the confined portions of the aquifer. The majority of the VRS property overlies the confined portion of the Ellenburger-San Saba Aquifer with a small portion of the recharge zone present at the northern edge of the property. Wells completed in the confined portion of the Ellenburger-San Saba Aquifer can produce moderate to large amounts of water.

The VRS property also overlies the confined portion of the Hickory Aquifer which is located stratigraphically below the Ellenburger-San Saba Aquifer. The Hickory has the capability of yielding



large volumes of fresh to slightly saline water to depths of approximately 3,000 ft. In general, radioactivity levels are detectable in some areas of the Hickory Aquifer due to uranium and thorium in Paleozoic shales and sandstones and from Precambrian igneous and metamorphic rocks (Preston et. al, 1996). Currently, there are no plans to utilize the Hickory Aquifer at the VRS property.

In addition, the VRS property overlies the recharge zone of the Trinity Aquifer which does not produce significant amounts of water in the immediate vicinity.

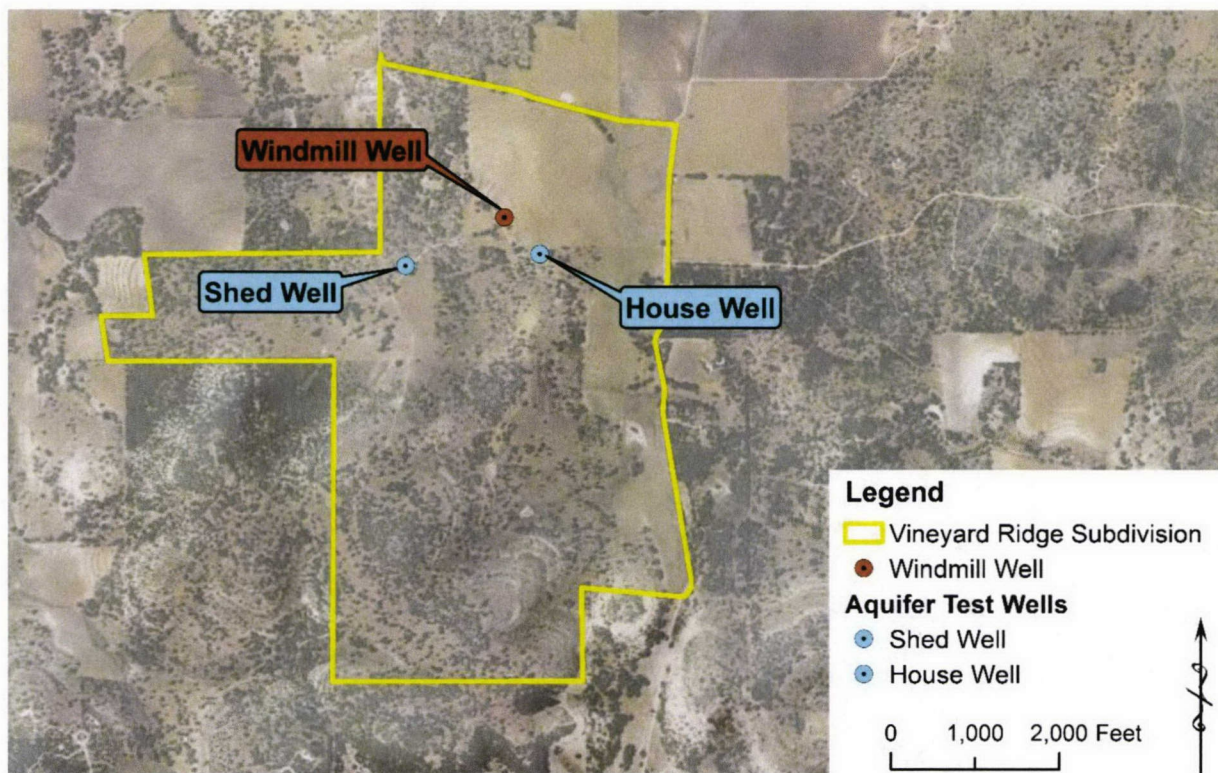




## **Section II: Aquifer Testing**

### **IV. 1 Well Details**

There are a total of three existing wells located on the VRS property: the House Well; the Shed Well; and the Windmill Well. Figure 5 provides a map showing the location of House Well and the Shed Well which were used to conduct the aquifer test (blue circles), in addition the Windmill Well is shown as an orange circle. Figure 6 provides well profiles showing formation depths and well construction while Table 1 provides a well summary. Appendix B provides the available well reports for the wells. Geophysical logs were run by HCUWCD staff on the House Well and the Shed Well; Figures 7 and 8 provide a well log profile detailing well construction and stratigraphy.



**Figure 5: Well location map**

For the aquifer test, the House Well was used as the pumping well and the Shed Well was used as an observation well. Based on the analysis of the geophysical logs, the House Well and the Shed Well are completed within the Ellenburger-San Saba Aquifer. No geophysical log was conducted on the Windmill Well, however a well report was located which indicates the well is most likely completed within the Ellenburger-San Saba Aquifer. A well report was located for the House Well which corresponds with the findings of the geophysical log, however no well report was found for the Shed Well. The VRS will be served by a centralized PWS with newly constructed wells located in the vicinity of the existing House Well. The following provides a summary of the well construction and stratigraphy for the House Well, Shed Well, and the Windmill Well:

**House Well**

The House Well is an existing well which was drilled by L & L Drilling Company in February 1985. According to the State of Texas Well Report, the well was drilled to a depth of 303 ft bgs with 6-inch PVC casing set to 103 ft bgs and an open hole completion of 6-inches from 103 to 303 ft bgs. The geophysical log indicates that the Upper Glen Rose Limestone is present from 0 to 78 ft bgs and the Staendebach Member of the Ellenburger Group is present from 78 ft bgs to the total log depth of 303 ft bgs.

**Shed Well**

No well report was located for the Shed Well. The geophysical log indicates that the Staendebach Member of the Ellenburger Group is present from the surface to the total log depth of 235 ft. bgs. According to the log, the well was constructed with 5-inch steel casing set to a depth of 110 ft. bgs and an open hole completion of 6 3/4-inches from 110 to 235 ft. bgs.

**Windmill Well**

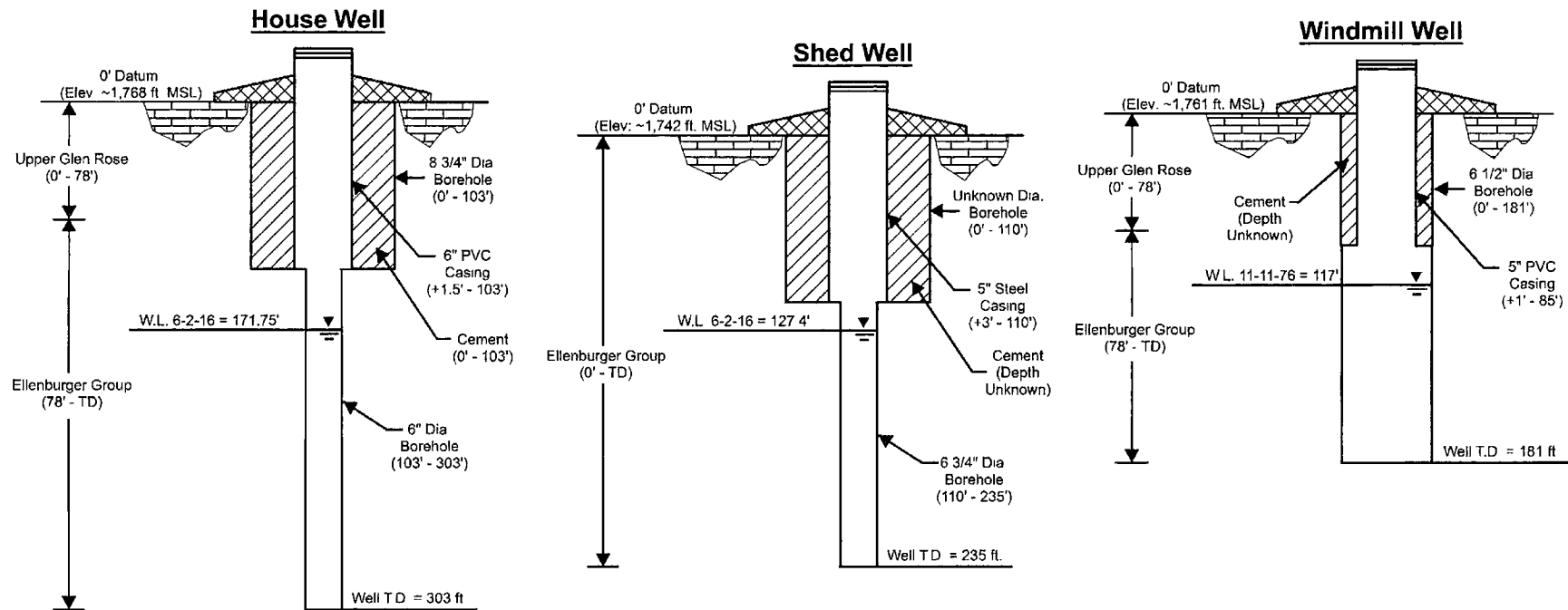
The Windmill Well was drilled by Lone Star Pump Service in November 1976. According to the State of Texas Well Report, the well was drilled to a depth of 181 ft. bgs with 5-inch PVC casing set to 85 ft. bgs and an open hole completion of 6 1/2-inches from 85 to 181 ft. bgs. No geophysical log was run on the Windmill Well, however based on the proximity to the House Well the formational depths are likely similar.



Table 1: Well summary of the Vineyard Ridge Subdivision wells

Well ID	Eatitude	Longitude	Elevation (ft MSL)	Date Completed	Well Depth (ft bgs)	Water Level (ft bgs)	Aquifer	Pump Yield (gpm)	Condition
House Well	30°19'15.8"N	98°37'39.9"W	1768	2/15/1985	303	171.75*	Ellenburger-San Saba	52 <sup>1</sup>	Existing
Shed Well	30°19'14.6"N	98°37'57.9"W	1742	-	235	127.4*	Ellenburger-San Saba	Unknown	Existing
Windmill Well	30°19'20.3"N	98°37'44.6"W	1761	11/11/1976	181	117 <sup>^</sup>	Ellenburger-San Saba	10 <sup>2</sup>	Existing

ft = feet, bgs = below ground surface, gpm = gallons per minute, N/A = Not Available, ^Water Level from Well Report 11/11/76, \*Water level from pump test June 2, 2016; <sup>1</sup>Yield from 2016 aquifer test; <sup>2</sup>Estimated by driller in 1976



## Notes:

- Well profiles created with information from downhole geophysical surveys and State of Texas Well Reports
- Figure for schematic purposes; not drawn to scale.

Figure 6: Well construction profiles of the existing Vineyard Ridge Subdivision wells



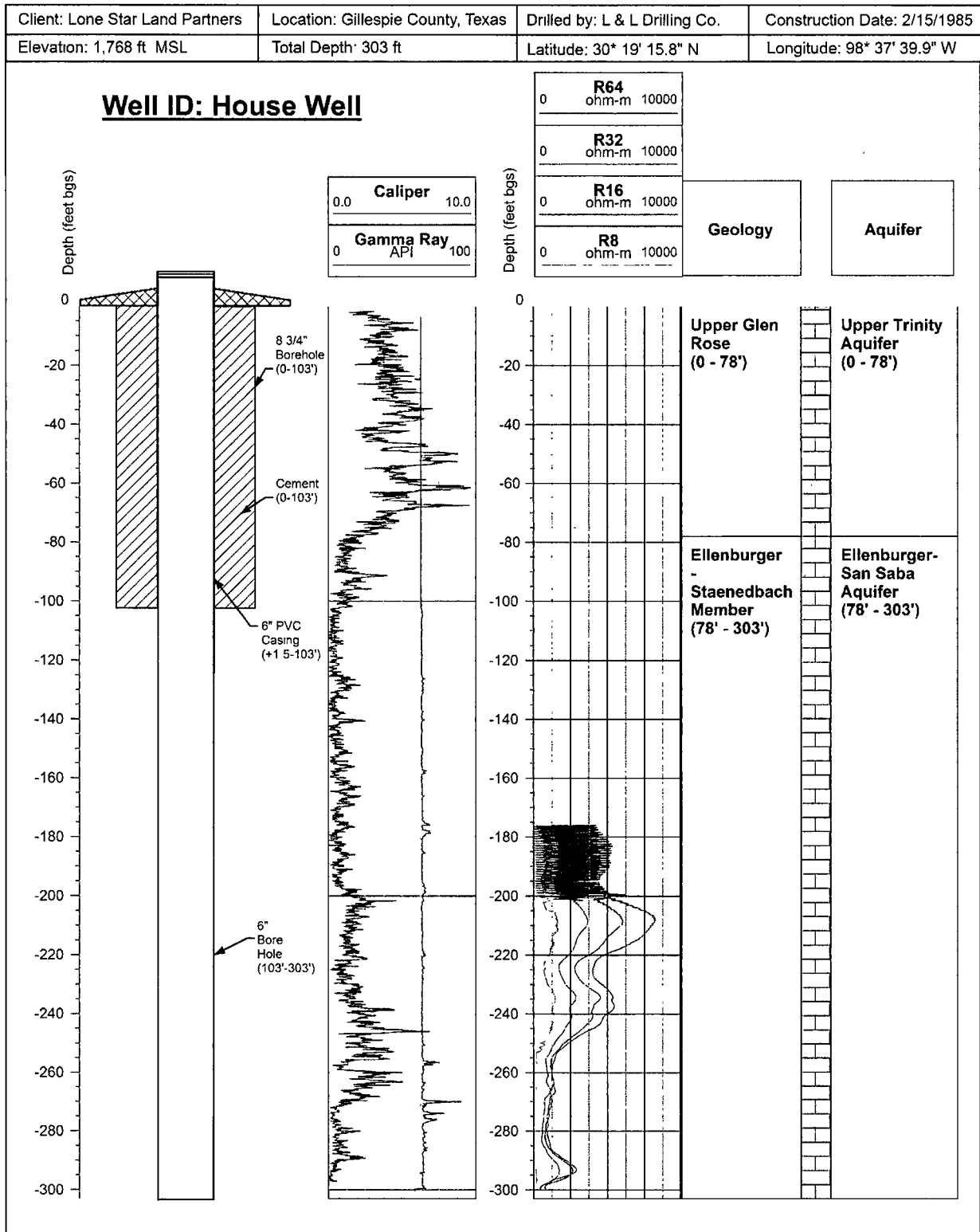


Figure 7: Well log profile of the House Well



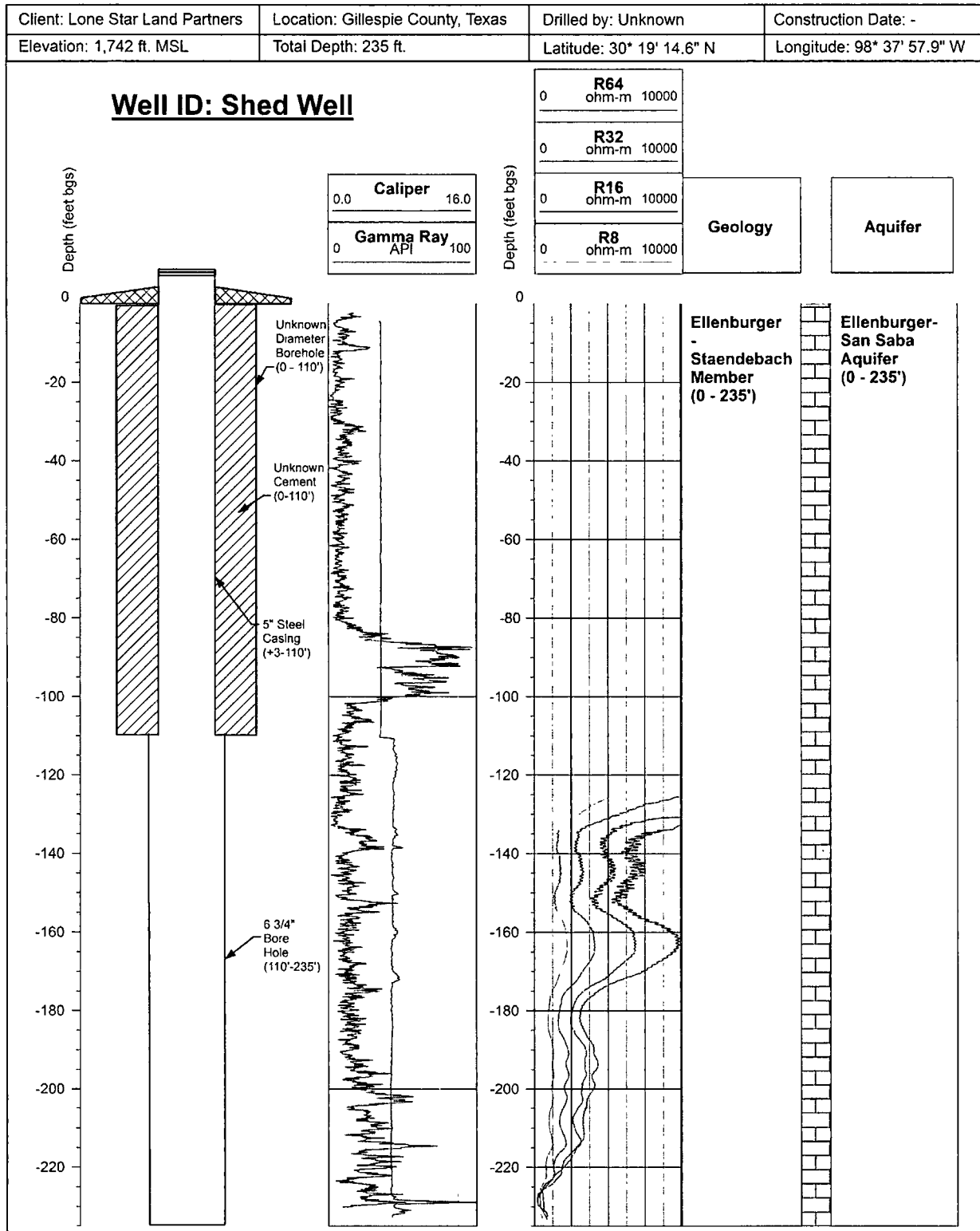


Figure 8: Well log profile of the Shed Well





## IV.2 Aquifer Testing

An aquifer test was completed to assess the hydrogeologic properties of the Ellenburger-San Saba Aquifer at the VRS property. Apex Drilling set a 10 horsepower pump within the House Well on 273 feet of 2 1/2-inch column pipe. Prior to the start of the aquifer test a pressure transducer capable of measuring the water level and temperature at one minute intervals was placed in the pumping well (House Well) and observation well (Shed Well). Prior to starting the aquifer test, the static water level within the House Well was measured at 1596.25 ft. mean sea level (msl) while the static water level within the Shed Well was measured at 1614.58 ft msl.

The aquifer test was conducted on June 2, 2016 with an average pump rate of 52 gallons per minute (gpm) over a 36.2 hour period. The initial pump rate was 70 gpm which resulted in approximately 63 feet of drawdown during the first 18 minutes of pumping. At that time, the pump rate was reduced four times between 18 minutes and 73 minutes to a rate of approximately 56 gpm to prevent the water level from drawing down to the pump (Appendix C). The final pump rate was 52 gpm with 91.98 feet of drawdown resulting in a specific capacity of 0.57 gpm/ft (Appendix C). Figure 9 provides a hydrograph showing the pumping well and the observation well water levels over the duration of the aquifer test. The water level within the pumping well was stable throughout the majority of the pumping phase (Figure 9); however, the water level in the observation well rose approximately 1 ft. during the pumping phase of the test indicating a lack of hydraulic connection. Due to the lack of hydraulic connection, a storage coefficient could not be calculated.

The data from the aquifer test was analyzed using the Cooper-Jacob method (Table 2). The analysis resulted in a transmissivity of 161 ft<sup>2</sup>/day and a hydraulic conductivity of 1.23 ft/day. Appendix C provides a data summary table and the results of the aquifer analysis. Appendix D provides the well efficiency calculation for the House Well.

**Table 2: Summary of aquifer test results**

Aquifer Test	Date	Wells	Static Water Level	Aquifer Test Duration (hours)	Average Pump Rate (gpm)	Drawdown (ft)	Specific Capacity (gpm/ft)	Transmissivity (ft <sup>2</sup> /d)	Hydraulic Conductivity (ft/d)	Storativity	Well Efficiency
House Well	June 2, 2016	House Well (PW)	171.75 (ft. bgs) 1596.25 (ft. msl)	36.2	52	91.98	0.57	161.0	1.23	-	99.3%
		Shed Well (OW)	127.4 (ft. bgs) 1614.58 (ft. msl)		-	+1.18	-	-	-	0.0001*	-

Note: PW = Pumping Well; OW = Observation Well; \* Storativity number from GAM Task 13-030: Total Estimated Recoverable Storage for Aquifers in Groundwater Management Area 7; ft. = feet; bgs = below ground surface; msl = mean sea level; gpm = gallons per minute; d = day



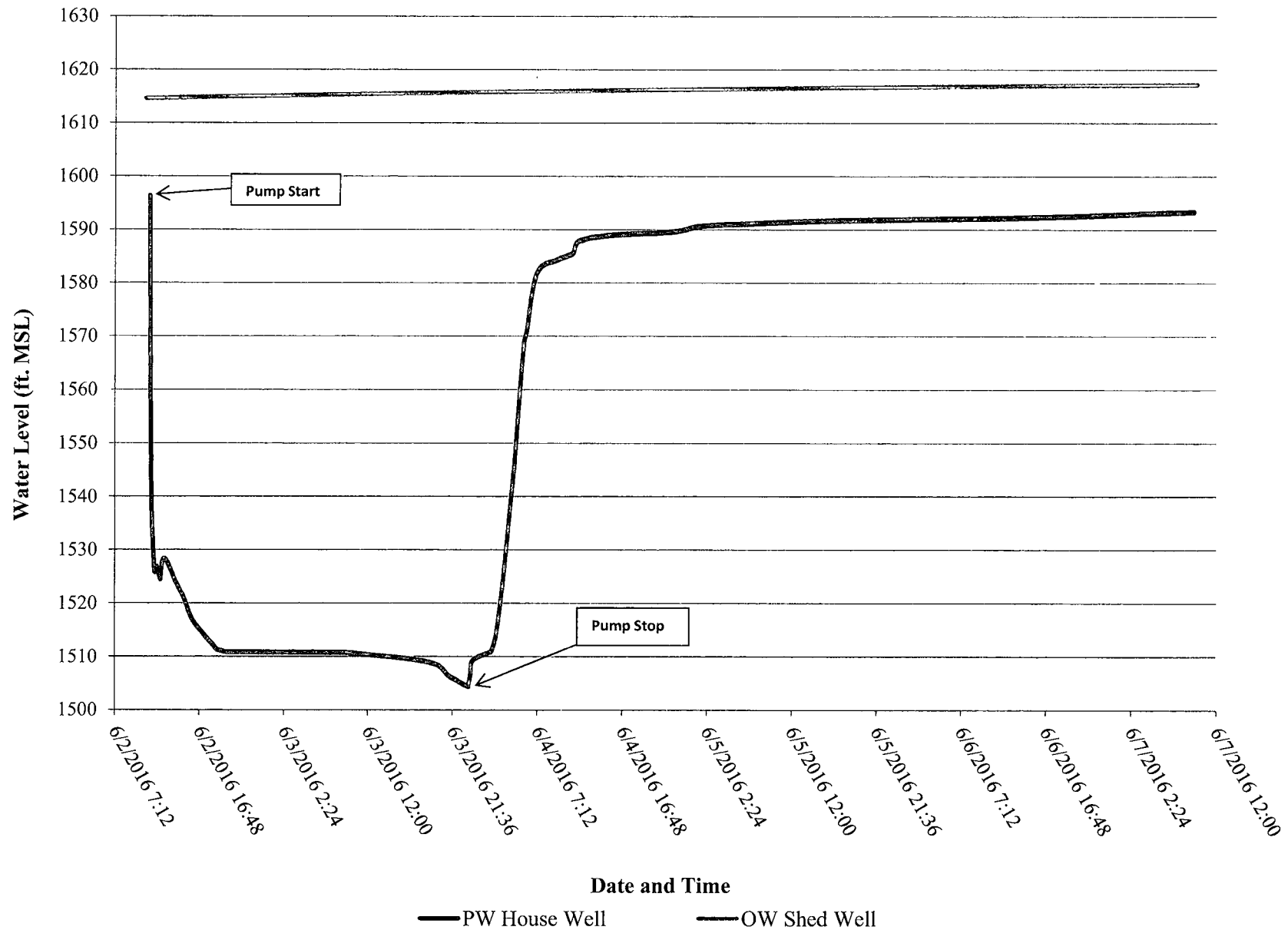


Figure 9: Aquifer test hydrograph of the House Well and Shed Well (June 2, 2016)



### IV.3. Water Quality

A water quality sample was collected from the House Well after the aquifer test was completed. The samples were collected by Apex Drilling staff in sealed containers provided by the laboratory and stored on ice in a cooler. The samples were transported after collection to the Lower Colorado River Authority's (LCRA) Environmental Laboratory Services (ESL) Laboratory. Appendix E provides a copy of the water quality report.

Table 3 provides the water quality summary of the House Well. The results were compared to Texas Commission on Environmental Quality (TCEQ) Primary Contaminant Levels (PCL) and Secondary Contaminant Levels (SCL). The water quality of the House Well met the TCEQ PCL and SCL standards except for nitrate. It is unknown what the source of the elevated nitrate concentration in the House Well is attributed towards. Fertilizers are often a common source of elevated nitrate in groundwater; the age of the well casing and surface completion of the House Well could be a contributing factor. VRS will be served by a central PWS with wells completed to TCEQ public supply well standards.

**Table 3: Water quality summary of the House Well**

Well	Date	units in mg/L												
		pH	TDS	As	Cl	F	Fe	NO <sub>2</sub>	NO <sub>3</sub>	Mn	Al	Cu	Zn	SO <sub>4</sub>
		Primary and Secondary Contaminant Levels (PCL/SCL)												
		≥ 7.0 <sup>2</sup>	1,000 <sup>2</sup>	0.01 <sup>1</sup>	300 <sup>2</sup>	4.0 <sup>1</sup> & 2.0 <sup>2</sup>	0.3 <sup>2</sup>	1.0 <sup>1</sup>	10 <sup>1</sup>	0.05 <sup>2</sup>	0.2 <sup>2</sup>	1.0 <sup>2</sup>	5.0 <sup>2</sup>	300 <sup>2</sup>
House Well	6/7/2016	7.6	600	<0.002	62.6	0.54	<0.05	<0.01	22	0.0016	0.0145	0.0035	0.369	419

Note: Results shown in **RED** indicate concentration greater than PCL or SCL



#### 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. Figure 10 provides a distance-drawdown plot for a single pumping well producing at a rate of 50 gpm for 13.05 hours a day. This represents the total water demand at full build out of the subdivision (0.27 acre-feet/year for each housing unit or 43.86 acre-feet/year). Appendix F provides the assumptions used in the calculations. Drawdown estimates were calculated using the Theis equation. The Theis equation employs the following assumptions:

- The water bearing formation is uniform in character and the hydraulic conductivity is the same in all directions;
- The formation is uniform in thickness and infinite in areal extent;
- The formation receives no recharge from any source;
- The pumped well penetrates, and receives water from, the full thickness of the water bearing formation;
- The water removed from storage is discharges instantaneously when the head is lowered;
- The pumping well is 100% efficient;
- All water removed from the well comes from aquifer storage;
- Laminar flow exists throughout the well and aquifer; and
- 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 appropriate for the Ellenburger Aquifer. These include assumptions 1, 3, 7 and 8. The Ellenburger 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.

Table 4 provides a summary of the results from the distance-drawdown calculations. Due to the lack of connection between the pumping well (House Well) and the observation well (Shed Well), it was not possible to calculate a storativity value. An average storage coefficient value of  $1.0 \times 10^{-4}$  was used in the drawdown calculations from the TWDB Ellenburger-San Saba Aquifer GAM Task 13-030. Estimates of drawdown are based upon the following assumptions:

- total daily water demand (entire subdivision) = 43.86 acre-feet/year (total water demand from a single public supply well) = 39,160 gallons per day (gpd);
- total daily water demand (per housing unit) = 0.27 acre-feet/year = 244.75 gpd; and
- the single public supply well will be pumped at 50 gpm for 13.05 hours per day.

**Table 4: Summary of distance-drawdown calculations**

Well	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
	(ft)	(ft)	Property Boundary Distance (ft)	Drawdown (ft)	Property Boundary Distance (ft)	Drawdown (ft)	(miles)	(miles)
Primary Public Supply Well	104.75	107.58	1,665	22.44	1,665	25.27	3.6	3.6

The recommended minimum spacing limit between wells is 750 feet with a recommended well yield of approximately 50 gpm. The recommended well spacing was established based upon the distance required to allow both wells to produce simultaneously at their maximum capacity (50 gpm) with minimal well interference. Although there are no plans to produce both PWS wells simultaneously, the well spacing will allow for minimal interference if required. The total daily water demand for the subdivision can be met by one well with a second well providing redundancy and additional supply to meet the TCEQ 0.6 gpm per connection. This recommendation is intended to be used as a guideline, the two public supply wells shall adhere to HCUWCD and TCEQ rules and regulations.



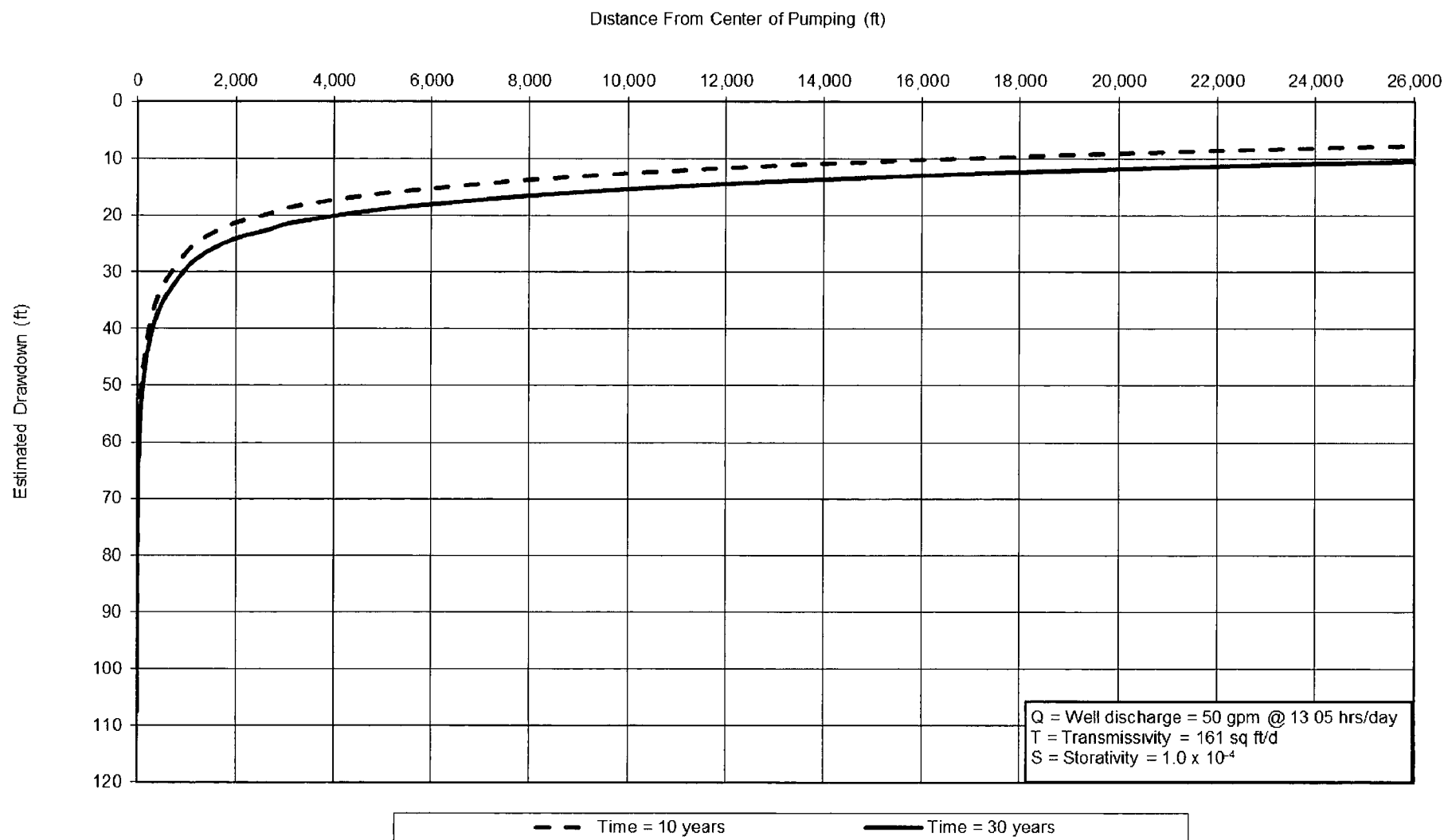


Figure 10: Distance drawdown plot for a single well within the Vineyard Ridge Subdivision



### **Section V: Proposed Public Water System**

The VRS will be served by a centralized water system with water supplied by two public supply wells. The system will utilize one well as the primary production well while a second well will serve as a back-up well for system redundancy and to meet the TCEQ 0.6 gpm per connection rule at full build out (160 lots). The TCEQ requires a water system to have a minimum of 0.6 gpm per connection well capacity. The location of the new wells will meet HCUWCD spacing requirements outlined in the district rules (Rule 5.6B) with Well No. 1 located greater than 430 feet from an existing well. The spacing between Well No. 1 and Well No. 2 will be approximately 750 ft. which is greater than the 300 ft. outlined in the HWUCD rule 5.6B for wells that produce between 17.36 to 200 gpm.

The proposed public supply wells will be constructed to TCEQ standards which are outlined in Texas Administration Code 30 Chapter 290, as well as adhering to HCUWCD well construction rules. The final depth and well construction will depend on the data gathered during the drilling of the pilot hole (formations encountered and depth of production zone), however based upon the analysis of the data for this report it is anticipated that total well depths will be between 300 and 500 ft. bgs. After a pilot hole is drilled a geophysical log will be run and the final well construction will be determined based upon the analysis of that data. The anticipated well construction will consist of 6-inch steel casing pressure cemented within a 10-inch diameter borehole to a depth of 200 ft bgs with an 8-inch open hole completion from 200 ft. bgs to 400 ft. bgs (depths are approximate). The wells will be completed within the Ellenburger-San Saba Aquifer.

The public supply well construction will most likely begin in the spring of 2017 pending the engineering design approval of the TCEQ, Gillespie County plat approval, and the approval of this Certification of Groundwater Availability for Platting Report. Production from the wells will most likely begin in the fall of 2017 pending approval of the PWS and the Certificate of Convenience and Necessity by the Public Utility Commission (PUC) of Texas.



**Section VI: Certification**

I, Bryan W. Boyd, Texas Licensed Professional Geoscientist, certificate number 11910, 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.





## **Section VII: References**

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## **Appendix A**

### Certification of Groundwater Availability for Platting Form



**CERTIFICATION OF GROUNDWATER AVAILABILITY FOR PLATTING FORM**

Use of this form: If required by a municipal authority pursuant to §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: Vineyard Ridge
2. Any Previous Name Which Identifies the Tract of Land: Nebgan Property - North Grape Creek Rd. Stonewall, TX
3. Property Owner's Name(s): Lone Star Land Partners  
 Address: 9508 East HWY 71, Spicewood, Texas 78669  
 Phone: 800-511-2430  
 Fax: \_\_\_\_\_
4. Plat Applicant's Name: Lone Star Land Partners  
 Address: 9508 East HWY 71, Spicewood, Texas 78669  
 Phone: 800-511-2430  
 Fax: \_\_\_\_\_
5. Licensed Professional Engineer or Geoscientist  
 Name: Bryan W. Boyd, P.G.  
 Address: 317 Ranch Road 620 S., Suite 203, Lakeway, TX 78734  
 Phone: 512-906-6291  
 Fax: \_\_\_\_\_  
 Certificate Number: TBPG License No: 11910
6. Location and Property Description of Proposed Subdivision: ~14 miles northeast from the City of Fredericksburg, TX on N. Grape Creek Road. The property is native pastureland.
7. Tax Assessor Parcel Number(s).  
 Book: Volume P-7215  
 Map: Vol. P-7215, pg. N/A  
 Parcel: Property IDs: 23133, 23134, 23135, 23136, 23138, 23140, & 23143

**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): 665 acres
10. Number of Proposed Lots: 160 lots
11. Average Size of Proposed Lots (acres): 4.2 acres
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 ☒  
 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): 160 single family housing units

Average Number of Persons per Housing Unit: 2.75 persons  
 Gallons of Water Required per Person per Day: 89 gallons per capita per day (gpcd)  
 Water Demand per Housing Unit per year (acre feet/year): 0.27 acre-ft (assuming 244.75 gpcd)  
 Total Expected Residential Water Demand per Year (acre feet/year): 41.1 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): N/A

16. Total Water Demand Estimate at Full Build Out (acre feet/year): 41.1 acre-ft

17. Sources of Information Used for Demand Estimates: Gillespie County

**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). Ellenberger - San Saba Aquifer*

Hickory 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 through 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: 52 gpm - 91.98 ft drawdown (See attached Tables 1 and 2)

Specific capacity: 0.57 gpm/ft (See attached Table 2 & Appendix C)

Efficiency of the pumped well: 99.3% (See attached Table 2 & Appendix D)

Transmissivity: 161 sq. ft/day (See attached Table 2 & Appendix C)

Coefficient of storage: 0.0001 (See attached Table 2)

Hydraulic conductivity: 1.23 ft/day (See attached Table 2 & Appendix C)

Were any recharge or barrier boundaries detected? Yes ☒ No

If yes, please describe:

Thickness of aquifer(s): 131.25 ft (See 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 104.75 feet over a 10-year period and 107.58 feet over a 30-year period. **See Attached Table 4**
37. Drawdown of the aquifer at the property boundary is estimated to be 22.44 feet over a 10-year period and 25.27 feet over a 30-year period. **See Attached Table 4**
38. The distance from the pumped well(s) to the outer edges of the cone(s)-of-depression is estimated to be 19,000 feet over a 10-year period and 19,000 feet over a 30-year period. **See Attached Table 4**
39. The recommended minimum spacing limit between wells is 750 feet with a recommended well yield of 50 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, Bryan W. Boyd, Texas Licensed Professional Engineer or Texas Licensed Professional Geoscientist (circle which applies), certificate number 11910, 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: 9/20/2016

(affix seal)

Adopted January 23, 2003

Effective February 13, 2003

## **Appendix B**

### State Well Reports



## House Well

House

1) OWNER Lawrence Nehron ER-02657 Address Rt. 1, Box 165A Fredericksburg, Tx. 78624  
 (Name) (Street or RFD) (City) (State) (Zip)

2) LOCATION OF WELL:  
 County Gillespie 13.10 miles in E. direction from Fredericksburg  
 (N.E., S.W., etc.) (Town)

☐ Legal description:

Section No. \_\_\_\_\_ Block No. \_\_\_\_\_ Township \_\_\_\_\_

Abstract No. \_\_\_\_\_ Survey Name \_\_\_\_\_

Distance and direction from two intersecting section or survey lines \_\_\_\_\_

Driller must complete the legal description to the right with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

☒ See attached map.

## 3) TYPE OF WORK (Check):

- ☒ New Well ☐ Deepening  
☐ Reconditioning ☐ Plugging

## 4) PROPOSED USE (Check):

- ☒ Domestic ☐ Industrial ☐ Public Supply  
☐ Irrigation ☐ Test Well ☐ Other \_\_\_\_\_

## 5) DRILLING METHOD (Check):

- ☐ Mud Rotary ☒ Air Hammer ☐ Driven ☐ Bored  
☐ Air Rotary ☐ Cable Tool ☐ Jetted ☐ Other \_\_\_\_\_

## 6) WELL LOG:

## DIAMETER OF HOLE

Dia. (in.) From (ft.) To (ft.)

8.75 Surface 103

Date drilled 2/15/85 6.0 103 303

## 7) BOREHOLE COMPLETION:

- ☐ Open Hole ☒ Straight Wall ☐ Underreamed  
☐ Gravel Packed ☐ Other \_\_\_\_\_

If Gravel Packed give interval ... from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

From (ft.) To (ft.)

Description and color of formation material

## 8) CASING, BLANK PIPE, AND WELL SCREEN DATA:

From (ft.)	To (ft.)	Description and color of formation material	Dia. (in.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft.)		Gage Casing Screen
						From	To	
0	1	topsoil (brown)						
1	35	caliche (white)						
35	80	shale & clay (gray) alternating with caliche (white)	6	new	plastic solid	0	103	.280
80	92	limestone (white)						
92	96	limestone (white) with clay layers (yellow)						
96	303	limestone (white & red)						
131	132	water (1 gpm)						
135	136	water (1 gpm)						
176	179	water (2 gpm)						
183	203	water (3 gpm)						
256	260	water (33 gpm)						
263	303	water (est. 160 gpm)						

## 9) CEMENTING DATA [Rule 319.44(b)]

Cemented from 0 ft. to 103 ft.  
ft. to \_\_\_\_\_ ft.Method used gravity cementedCemented by L & L Drilling Co.

## 10) SURFACE COMPLETION

- ☐ Specified Surface Slab Installed [Rule 319.44(c)]  
☐ Pitless Adapter Used [Rule 319.44(d)]  
☒ Approved Alternative Procedure Used [Rule 319.71]

## 11) WATER LEVEL:

Static level 170 ft. below land surface Date 2/15/85

Artesian flow \_\_\_\_\_ gpm. Date \_\_\_\_\_

## 12) PACKERS:

Type Depth

Larkins Rubber cup 103 ft.

## 13) TYPE PUMP:

- ☐ Turbine ☐ Jet ☐ Submersible ☐ Cylinder  
☐ Other \_\_\_\_\_

Depth to pump bowls, cylinder, jet, etc., \_\_\_\_\_ ft.

## 15) WATER QUALITY:

Did you knowingly penetrate any strata which contained undesirable water? ☐ Yes ☒ No

If yes, submit "REPORT OF UNDESIRABLE WATER"

Type of water? \_\_\_\_\_ Depth of strata \_\_\_\_\_

Was a chemical analysis made? ☐ Yes ☒ No

## 14) WELL TESTS:

Type Test: ☐ Pump ☐ Bailer ☒ Jetted ☒ EstimatedYield: 200 gpm with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

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 12 will result in the log(s) being returned for completion and resubmittal.



## Windmill Well

ER-01746 KR 7444

Send original copy by certified mail to the Texas Water Development Board, P. O. Box 13087, Austin, Texas 78711

State of Texas

For 1968 use only: Well No. \_\_\_\_\_

1) OWNER: Person having well drilled Lawrence Nebgen Address 158 W. Main St. Fredericksburg, Texas (Street or RFD) (City) (State) (Zip)

Landowner Lawrence Nebgen Address 158 W. Main St. Fredericksburg, Texas (Street or RFD) (City) (State) (Zip)

2) LOCATION OF WELL: County Gillespie 17 miles in NE direction from Fredericksburg, Texas (Mileage) (Direction) (Town)

Locate by sketch map showing landmarks, roads, creeks, highway number, etc. Map On Back Side

Locate by sketch map showing distances and directions from nearest sections or section lines.

League \_\_\_\_\_ Survey \_\_\_\_\_ Abstract No. \_\_\_\_\_ (M, 1/4, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20) of Section \_\_\_\_\_

3) TYPE OF WORK (Check): New Well Deepening \_\_\_\_\_ Reconditioning \_\_\_\_\_ Plugging \_\_\_\_\_ 4) PURPOSE (Check): Domestic Irrigation \_\_\_\_\_ Industrial \_\_\_\_\_ Test Well \_\_\_\_\_ Municipal \_\_\_\_\_ Other \_\_\_\_\_ 5) TYPE OF WELL (Check): Cable Rotary \_\_\_\_\_ Driven \_\_\_\_\_ Dug \_\_\_\_\_ Jetted \_\_\_\_\_ Bored \_\_\_\_\_

6) WELL LOG: Diameter of hole 6 in. Depth drilled 181 ft. Depth of completed well 85 ft. Date drilled 11-11-76

All measurements made from \_\_\_\_\_ ft. above ground level.

From (ft.)	To (ft.)	Description and color of formation material	Notes
0	26	Black Soil	
26	33	Caliche	
33	60	White Clay	
60	71	Caliche With Lime Rock	
71	74	Pink Lime	
74	181	Yellowish Clay	
181		Brown River Rock	

7) COMPLETION (Check): Open hole Straight well \_\_\_\_\_ Under reamed \_\_\_\_\_ Cased \_\_\_\_\_ Other \_\_\_\_\_

8) WATER LEVEL: Static level 117 ft. below land surface Date 11-18-76 Artesian pressure \_\_\_\_\_ lbs. per square inch Date \_\_\_\_\_ Depth to pump bowl, cylinder, jet, etc., below land surface. \_\_\_\_\_

9) SCREEN: Type \_\_\_\_\_ Diameter (inches) \_\_\_\_\_ From (ft.) \_\_\_\_\_ To (ft.) \_\_\_\_\_ Slot size \_\_\_\_\_

10) TESTS: 11) WELL TESTS: Was a pump test made? \_\_\_\_\_ No \_\_\_\_\_ If yes, by whom? \_\_\_\_\_ Yield: \_\_\_\_\_ gpm with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs. Miller test: 10 gpm with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs. Artesian flow \_\_\_\_\_ Temperature of water \_\_\_\_\_

12) WATER QUALITY: Was a chemical analysis made? \_\_\_\_\_ Yes \_\_\_\_\_ No Did any strata contain undesirable water? \_\_\_\_\_ Yes \_\_\_\_\_ No Type of water? \_\_\_\_\_ depth of strata \_\_\_\_\_

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.

NAME Eldon Ray Feller Water Well Drillers Registration No. 1297 (Type or Print)

ADDRESS 1107 East Main Street P. O. Box 233 Fredericksburg, Texas 78624 (Street or RFD) (City) (State) (Zip)

(Signed) Eldon Ray Feller Lone Star Pump Service (Water Well Driller) (Company Name)

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

Additional instructions on reverse side.

11/18/91/14

## **Appendix C**

### Aquifer Test Data and Analysis



**Vineyard Ridge Subdivision House Well - Aquifer Test (June 2, 2016)**

Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW House Well Temperature (F)	PW House Well Water Level (ft. bgs)	PW House Well Water Level (ft. MSL)	PW House Well Drawdown (ft.)	Pump Rate (gpm)	Specific Capacity (gpm/ft.)	OW Shed Well Water Level (ft. MSL)	OW Shed Well Drawdown (ft.)	Comments
6/2/2016 11:09	0		69.37	171.75	1596.25				1614.58	0.00	Pump Start
6/2/2016 11:10	1		69.26	181.57	1586.43	9.82	70	7.13	1614.53	0.05	Meter = 802,500 gallons
6/2/2016 11:11	2		69.16	189.91	1578.09	18.16			1614.60	-0.02	
6/2/2016 11:12	3		69.07	196.25	1571.75	24.50	70	2.86	1614.55	0.03	
6/2/2016 11:13	4		69.01	201.21	1566.79	29.46			1614.54	0.04	
6/2/2016 11:14	5		68.96	205.58	1562.42	33.83	70	2.07	1614.56	0.02	
6/2/2016 11:15	6		68.93	209.73	1558.27	37.98			1614.50	0.07	
6/2/2016 11:16	7		68.91	213.39	1554.61	41.64	70	1.68	1614.58	0.00	
6/2/2016 11:17	8		68.90	216.62	1551.38	44.87			1614.56	0.02	
6/2/2016 11:18	9		68.90	219.65	1548.35	47.90			1614.56	0.02	
6/2/2016 11:19	10		68.90	222.29	1545.71	50.54	70	1.39	1614.55	0.03	
6/2/2016 11:20	11		68.90	224.77	1543.23	53.02			1614.54	0.04	
6/2/2016 11:21	12		68.91	226.87	1541.13	55.12			1614.49	0.09	
6/2/2016 11:22	13		68.92	228.76	1539.24	57.01			1614.50	0.08	
6/2/2016 11:23	14		68.94	230.48	1537.52	58.73			1614.59	-0.01	
6/2/2016 11:24	15		68.95	231.85	1536.15	60.10	70	1.16	1614.59	-0.01	
6/2/2016 11:25	16		68.96	232.91	1535.09	61.16			1614.59	-0.01	
6/2/2016 11:26	17		68.98	233.55	1534.45	61.80			1614.52	0.06	
6/2/2016 11:27	18		68.99	234.33	1533.68	62.58	65	1.04	1614.53	0.05	reduced pump rate
6/2/2016 11:28	19		69.00	235.05	1532.95	63.30			1614.61	-0.03	
6/2/2016 11:29	20		69.02	235.43	1532.57	63.68	64	1.00	1614.58	0.00	
6/2/2016 11:30	21		69.03	235.98	1532.02	64.23			1614.61	-0.03	
6/2/2016 11:31	22		69.04	236.48	1531.52	64.73			1614.56	0.02	
6/2/2016 11:32	23		69.05	237.01	1530.99	65.26			1614.55	0.03	
6/2/2016 11:33	24		69.06	237.62	1530.38	65.87			1614.53	0.05	
6/2/2016 11:34	25		69.07	238.16	1529.84	66.41	64	0.96	1614.62	-0.04	
6/2/2016 11:35	26		69.08	238.72	1529.28	66.97			1614.55	0.03	
6/2/2016 11:36	27		69.09	239.28	1528.72	67.53			1614.57	0.01	
6/2/2016 11:37	28		69.09	239.84	1528.16	68.09			1614.59	-0.02	
6/2/2016 11:38	29		69.09	240.48	1527.52	68.73			1614.57	0.00	

Note: bgs = below ground surface      Column Pipe Diameter = 2 1/2-inch      Horsepower = 10 HP  
 MSL = Mean Sea Level      Pump Setting = 273 ft

**Vineyard Ridge Subdivision House Well - Aquifer Test (June 2, 2016)**

Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW House Well Temperature (F)	PW House Well Water Level (ft. bgs)	PW House Well Water Level (ft. MSL)	PW House Well Drawdown (ft.)	Pump Rate (gpm)	Specific Capacity (gpm/ft.)	OW Shed Well Water Level (ft. MSL)	OW Shed Well Drawdown (ft.)	Comments
6/2/2016 11:39	30		69.11	240.98	1527.02	69.23	62	0.90	1614.57	0.01	Reduced pump rate
6/2/2016 11:40	31		69.10	241.58	1526.42	69.83			1614.62	-0.05	
6/2/2016 11:41	32		69.11	242.13	1525.87	70.38			1614.58	0.00	
6/2/2016 11:42	33		69.11	242.00	1526.00	70.25			1614.60	-0.02	
6/2/2016 11:43	34		69.11	242.10	1525.90	70.35			1614.52	0.06	
6/2/2016 11:44	35		69.10	242.25	1525.75	70.50	60	0.85	1614.61	-0.03	Reduced pump rate
6/2/2016 11:45	36		69.10	242.10	1525.90	70.35			1614.53	0.05	
6/2/2016 11:46	37		69.10	241.98	1526.02	70.23			1614.65	-0.07	
6/2/2016 11:47	38		69.09	241.95	1526.06	70.20			1614.62	-0.04	
6/2/2016 11:48	39		69.09	241.93	1526.07	70.18			1614.56	0.02	
6/2/2016 11:49	40		69.10	242.07	1525.93	70.32			1614.61	-0.03	
6/2/2016 11:50	41		69.09	241.67	1526.33	69.92			1614.55	0.03	
6/2/2016 11:51	42		69.09	241.41	1526.59	69.66			1614.59	-0.01	
6/2/2016 11:52	43		69.09	241.30	1526.70	69.55			1614.59	-0.01	
6/2/2016 11:53	44		69.10	241.18	1526.82	69.43			1614.63	-0.05	
6/2/2016 11:54	45		69.10	241.08	1526.93	69.33	60	0.87	1614.60	-0.02	
6/2/2016 12:09	60		69.10	242.23	1525.78	70.48	60	0.85	1614.61	-0.03	
6/2/2016 12:22	73		69.11	243.62	1524.39	71.87	56	0.78	1614.61	-0.04	Reduced pump rate
6/2/2016 12:24	75		69.10	243.27	1524.73	71.52	56	0.78	1614.56	0.02	
6/2/2016 12:39	90		69.04	240.00	1528.01	68.25	56	0.82	1614.59	-0.01	
6/2/2016 12:54	105		69.03	239.65	1528.36	67.90	56	0.82	1614.62	-0.04	
6/2/2016 13:09	120		69.03	240.25	1527.75	68.50	56	0.82	1614.67	-0.09	
6/2/2016 13:39	150		69.02	242.19	1525.81	70.44	56	0.79	1614.69	-0.11	
6/2/2016 13:49	160		69.02	242.92	1525.08	71.17	56	0.79	1614.74	-0.16	
6/2/2016 14:09	180		69.01	244.04	1523.96	72.29	56	0.77	1614.66	-0.09	
6/2/2016 15:09	240		68.99	247.54	1520.46	75.79			1614.75	-0.17	
6/2/2016 16:09	300		68.96	251.38	1516.62	79.63			1614.77	-0.19	
6/2/2016 17:09	360		68.95	253.59	1514.41	81.84			1614.76	-0.18	
6/2/2016 18:09	420		68.94	255.52	1512.48	83.77			1614.82	-0.25	
6/2/2016 19:09	480		68.93	256.75	1511.25	85.00			1614.85	-0.27	

Note: bgs = below ground surface      Column Pipe Diameter = 2 1/2-inch      Horsepower = 10 HP  
 MSL = Mean Sea Level      Pump Setting = 273 ft

**Vineyard Ridge Subdivision House Well - Aquifer Test (June 2, 2016)**

Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW House Well Temperature (F)	PW House Well Water Level (ft. bgs)	PW House Well Water Level (ft. MSL)	PW House Well Drawdown (ft.)	Pump Rate (gpm)	Specific Capacity (gpm/ft.)	OW Shed Well Water Level (ft. MSL)	OW Shed Well Drawdown (ft.)	Comments
6/2/2016 20:09	540		68.93	257.15	1510.85	85.40			1614.87	-0.29	
6/2/2016 21:09	600		68.94	257.03	1510.97	85.28			1614.90	-0.32	
6/2/2016 22:09	660		68.93	257.04	1510.96	85.29			1614.95	-0.37	
6/2/2016 23:09	720		68.93	257.10	1510.90	85.35	56	0.66	1615.02	-0.44	
6/3/2016 0:09	780		68.93	257.09	1510.91	85.34			1614.96	-0.38	
6/3/2016 1:09	840		68.92	257.19	1510.81	85.44			1615.01	-0.43	
6/3/2016 2:09	900		68.92	257.23	1510.77	85.48			1615.14	-0.56	
6/3/2016 3:09	960		68.92	257.12	1510.88	85.37			1615.10	-0.53	
6/3/2016 4:09	1020		68.92	257.14	1510.86	85.39			1615.11	-0.53	
6/3/2016 5:09	1080		68.92	257.27	1510.73	85.52			1615.16	-0.58	
6/3/2016 6:09	1140		68.91	257.13	1510.87	85.38			1615.26	-0.68	
6/3/2016 7:09	1200		68.91	257.16	1510.84	85.41			1615.27	-0.69	
6/3/2016 8:09	1260		68.91	257.17	1510.83	85.42			1615.25	-0.67	
6/3/2016 9:09	1320		68.91	257.31	1510.69	85.56			1615.25	-0.67	
6/3/2016 10:09	1380		68.91	257.30	1510.70	85.55			1615.35	-0.77	
6/3/2016 11:09	1440		68.91	257.58	1510.42	85.83			1615.38	-0.80	
6/3/2016 12:09	1500		68.91	257.60	1510.40	85.85			1615.38	-0.80	
6/3/2016 13:09	1560		68.91	257.93	1510.07	86.18			1615.42	-0.84	
6/3/2016 14:09	1620		68.91	258.05	1509.95	86.30			1615.46	-0.88	
6/3/2016 15:09	1680		68.91	258.08	1509.92	86.33			1615.51	-0.93	
6/3/2016 16:09	1740		68.91	258.31	1509.69	86.56			1615.61	-1.03	
6/3/2016 17:09	1800		68.91	258.57	1509.43	86.82			1615.57	-0.99	
6/3/2016 18:09	1860		68.90	258.91	1509.09	87.16			1615.58	-1.01	
6/3/2016 19:09	1920		68.91	259.21	1508.79	87.46			1615.58	-1.00	
6/3/2016 20:09	1980		68.91	259.79	1508.21	88.04			1615.63	-1.05	
6/3/2016 21:09	2040		68.91	261.53	1506.47	89.78			1615.67	-1.09	
6/3/2016 22:09	2100		68.89	262.50	1505.50	90.75			1615.62	-1.04	
6/3/2016 23:09	2160		68.90	263.43	1504.57	91.68			1615.66	-1.08	
6/3/2016 23:23	2174	0	68.90	263.73	1504.27	91.98	52	0.57	1615.76	-1.18	Pump Stop
6/3/2016 23:24	2175	1	68.90	263.12	1504.88	91.37			1615.72	-1.14	Meter = 915,200 gallons

Note: bgs = below ground surface      Column Pipe Diameter = 2 1/2-inch      Horsepower = 10 HP  
 MSL = Mean Sea Level      Pump Setting = 273 ft

**Vineyard Ridge Subdivision House Well - Aquifer Test (June 2, 2016)**

Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW House Well Temperature (F)	PW House Well Water Level (ft. bgs)	PW House Well Water Level (ft. MSL)	PW House Well Drawdown (ft.)	Pump Rate (gpm)	Specific Capacity (gpm/ft.)	OW Shed Well Water Level (ft. MSL)	OW Shed Well Drawdown (ft.)	Comments
6/3/2016 23:25	2176	2	68.90	262.99	1505.01	91.24			1615.71	-1.13	
6/3/2016 23:26	2177	3	68.90	262.84	1505.16	91.09			1615.69	-1.12	
6/3/2016 23:27	2178	4	68.90	262.84	1505.16	91.09			1615.75	-1.17	
6/3/2016 23:28	2179	5	68.92	262.64	1505.37	90.89			1615.78	-1.20	
6/3/2016 23:29	2180	6	68.96	262.61	1505.39	90.86			1615.70	-1.12	
6/3/2016 23:30	2181	7	69.05	262.50	1505.50	90.75			1615.67	-1.09	
6/3/2016 23:31	2182	8	69.12	262.37	1505.63	90.62			1615.68	-1.10	
6/3/2016 23:32	2183	9	69.18	262.06	1505.94	90.31			1615.78	-1.20	
6/3/2016 23:33	2184	10	69.23	261.93	1506.08	90.18			1615.72	-1.14	
6/3/2016 23:34	2185	11	69.34	261.85	1506.15	90.10			1615.73	-1.15	
6/3/2016 23:35	2186	12	69.44	261.64	1506.36	89.89			1615.72	-1.14	
6/3/2016 23:36	2187	13	69.51	261.31	1506.69	89.56			1615.74	-1.16	
6/3/2016 23:37	2188	14	69.54	260.94	1507.06	89.19			1615.72	-1.14	
6/3/2016 23:38	2189	15	69.54	260.48	1507.52	88.73			1615.80	-1.22	
6/3/2016 23:43	2194	20	69.54	259.15	1508.85	87.40			1615.69	-1.11	
6/3/2016 23:48	2199	25	69.50	258.98	1509.02	87.23			1615.71	-1.13	
6/3/2016 23:53	2204	30	69.53	258.77	1509.23	87.02			1615.74	-1.16	
6/4/2016 0:08	2219	45	69.38	258.47	1509.53	86.72			1615.66	-1.08	
6/4/2016 0:23	2234	60	69.14	258.19	1509.81	86.44			1615.72	-1.14	
6/4/2016 0:38	2249	75	69.05	257.99	1510.01	86.24			1615.77	-1.19	
6/4/2016 0:53	2264	90	69.00	257.85	1510.15	86.10			1615.80	-1.23	
6/4/2016 1:08	2279	105	68.98	257.57	1510.43	85.82			1615.79	-1.22	
6/4/2016 1:23	2294	120	68.96	257.39	1510.61	85.64			1615.75	-1.17	
6/4/2016 2:23	2354	180	68.93	254.77	1513.23	83.02			1615.77	-1.19	
6/4/2016 3:23	2414	240	68.92	242.10	1525.90	70.35			1615.74	-1.16	
6/4/2016 4:23	2474	300	68.92	225.34	1542.66	53.59			1615.84	-1.27	
6/4/2016 5:23	2534	360	68.92	203.89	1564.11	32.14			1615.85	-1.27	
6/4/2016 6:23	2594	420	68.92	191.37	1576.63	19.62			1615.92	-1.34	
6/4/2016 7:23	2654	480	68.92	185.36	1582.64	13.61			1615.87	-1.29	
6/4/2016 8:23	2714	540	68.92	184.10	1583.90	12.35			1615.90	-1.32	

Note: bgs = below ground surface      Column Pipe Diameter = 2 1/2-inch      Horsepower = 10 HP  
 MSL = Mean Sea Level      Pump Setting = 273 ft

**Vineyard Ridge Subdivision House Well - Aquifer Test (June 2, 2016)**

Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW House Well Temperature (F)	PW House Well Water Level (ft. bgs)	PW House Well Water Level (ft. MSL)	PW House Well Drawdown (ft.)	Pump Rate (gpm)	Specific Capacity (gpm/ft.)	OW Shed Well Water Level (ft. MSL)	OW Shed Well Drawdown (ft.)	Comments
6/4/2016 9:23	2774	600	68.92	183.58	1584.42	11.83			1615.97	-1.39	
6/4/2016 10:23	2834	660	68.92	183.00	1585.00	11.25			1616.04	-1.46	
6/4/2016 11:23	2894	720	68.92	181.08	1586.92	9.33			1616.00	-1.43	
6/4/2016 12:23	2954	780	68.94	179.74	1588.26	7.99			1615.96	-1.38	
6/4/2016 13:23	3014	840	68.93	179.34	1588.66	7.59			1616.05	-1.47	
6/4/2016 14:23	3074	900	68.93	179.15	1588.85	7.40			1616.09	-1.51	
6/4/2016 15:23	3134	960	68.93	178.97	1589.04	7.22			1616.11	-1.53	
6/4/2016 16:23	3194	1020	68.92	178.79	1589.21	7.04			1616.18	-1.60	
6/4/2016 17:23	3254	1080	68.92	178.72	1589.28	6.97			1616.11	-1.54	
6/4/2016 18:23	3314	1140	68.92	178.65	1589.36	6.90			1616.13	-1.55	
6/4/2016 19:23	3374	1200	68.92	178.59	1589.41	6.84			1616.18	-1.60	
6/4/2016 20:23	3434	1260	68.92	178.69	1589.31	6.94			1616.13	-1.55	
6/4/2016 21:23	3494	1320	68.92	178.46	1589.54	6.71			1616.21	-1.63	
6/4/2016 22:23	3554	1380	68.91	178.32	1589.68	6.57			1616.25	-1.67	
6/4/2016 23:23	3614	1440	68.91	178.28	1589.72	6.53			1616.21	-1.63	
6/5/2016 0:23	3674	1500	68.91	177.87	1590.13	6.12			1616.26	-1.68	
6/5/2016 1:23	3734	1560	68.90	177.37	1590.63	5.62			1616.36	-1.78	
6/5/2016 2:23	3794	1620	68.90	177.17	1590.83	5.42			1616.39	-1.81	
6/5/2016 3:23	3854	1680	68.91	177.01	1590.99	5.26			1616.31	-1.73	
6/5/2016 4:23	3914	1740	68.90	176.98	1591.03	5.22			1616.35	-1.77	
6/5/2016 5:23	3974	1800	68.91	176.86	1591.14	5.11			1616.37	-1.79	
6/5/2016 6:23	4034	1860	68.90	177.05	1590.95	5.30			1616.43	-1.85	
6/5/2016 7:23	4094	1920	68.91	176.96	1591.04	5.21			1616.42	-1.84	
6/5/2016 8:23	4154	1980	68.90	176.87	1591.13	5.12			1616.35	-1.77	
6/5/2016 9:23	4214	2040	68.90	176.79	1591.21	5.04			1616.43	-1.85	
6/5/2016 10:23	4274	2100	68.90	176.55	1591.45	4.80			1616.50	-1.92	
6/5/2016 11:23	4334	2160	68.90	176.49	1591.51	4.74			1616.50	-1.92	
6/5/2016 12:23	4394	2220	68.90	176.63	1591.37	4.88			1616.50	-1.92	
6/5/2016 13:23	4454	2280	68.90	176.48	1591.53	4.72			1616.54	-1.96	
6/5/2016 14:23	4514	2340	68.91	176.43	1591.58	4.68			1616.54	-1.96	

Note: bgs = below ground surface      Column Pipe Diameter = 2 1/2-inch      Horsepower = 10 HP  
 MSL = Mean Sea Level      Pump Setting = 273 ft

**Vineyard Ridge Subdivision House Well - Aquifer Test (June 2, 2016)**

Date and Time	Time Since Pump Start (min)	Time Since Pump Stop (min)	PW House Well Temperature (F)	PW House Well Water Level (ft. bgs)	PW House Well Water Level (ft. MSL)	PW House Well Drawdown (ft.)	Pump Rate (gpm)	Specific Capacity (gpm/ft.)	OW Shed Well Water Level (ft. MSL)	OW Shed Well Drawdown (ft.)	Comments
6/5/2016 15:23	4574	2400	68.90	176.26	1591.74	4.51			1616.59	-2.01	
6/5/2016 16:23	4634	2460	68.91	176.18	1591.82	4.43			1616.62	-2.04	
6/5/2016 17:23	4694	2520	68.91	176.30	1591.71	4.54			1616.64	-2.06	
6/5/2016 18:23	4754	2580	68.90	176.32	1591.68	4.57			1616.70	-2.12	
6/5/2016 19:23	4814	2640	68.90	176.28	1591.72	4.53			1616.66	-2.08	
6/5/2016 20:23	4874	2700	68.90	176.26	1591.74	4.51			1616.69	-2.11	
6/5/2016 21:23	4934	2760	68.90	176.02	1591.98	4.27			1616.71	-2.13	
6/5/2016 22:23	4994	2820	68.90	176.03	1591.97	4.28			1616.78	-2.20	
6/5/2016 23:23	5054	2880	68.90	176.21	1591.79	4.46			1616.69	-2.11	
6/6/2016 0:23	5114	2940	68.90	176.09	1591.91	4.34			1616.70	-2.12	
6/6/2016 1:23	5174	3000	68.90	176.04	1591.96	4.29			1616.71	-2.14	
6/6/2016 2:23	5234	3060	68.91	175.94	1592.06	4.19			1616.78	-2.20	
6/6/2016 3:23	5294	3120	68.91	175.89	1592.11	4.14			1616.72	-2.14	
6/6/2016 4:23	5354	3180	68.91	175.88	1592.12	4.13			1616.76	-2.18	
6/6/2016 5:23	5414	3240	68.91	176.05	1591.95	4.30			1616.80	-2.22	
6/6/2016 6:23	5474	3300	68.90	175.81	1592.19	4.06			1616.83	-2.25	
6/6/2016 7:23	5534	3360	68.90	176.02	1591.98	4.27			1616.80	-2.22	
6/6/2016 8:23	5594	3420	68.91	175.79	1592.21	4.04			1616.88	-2.30	
6/6/2016 9:23	5654	3480	68.90	175.97	1592.03	4.22			1616.90	-2.32	
6/6/2016 10:23	5714	3540	68.90	175.87	1592.13	4.12			1616.90	-2.32	
6/6/2016 11:23	5774	3600	68.90	175.71	1592.29	3.96			1616.87	-2.29	
6/6/2016 12:23	5834	3660	68.90	175.90	1592.11	4.15			1616.94	-2.36	
6/6/2016 13:23	5894	3720	68.90	175.64	1592.36	3.89			1616.87	-2.29	
6/6/2016 14:23	5954	3780	68.90	175.61	1592.39	3.86			1616.98	-2.40	
6/6/2016 15:23	6014	3840	68.90	175.76	1592.24	4.01			1616.98	-2.40	
6/6/2016 16:23	6074	3900	68.90	175.72	1592.28	3.97			1617.06	-2.48	
6/6/2016 17:23	6134	3960	68.90	175.69	1592.32	3.94			1616.99	-2.41	
6/6/2016 18:23	6194	4020	68.90	175.52	1592.48	3.77			1616.99	-2.41	
6/6/2016 19:23	6254	4080	68.90	175.59	1592.41	3.84			1617.12	-2.54	
6/6/2016 20:23	6314	4140	68.90	175.35	1592.66	3.60			1617.05	-2.47	

Note: bgs = below ground surface      Column Pipe Diameter = 2 1/2-inch      Horsepower = 10 HP  
 MSL = Mean Sea Level      Pump Setting = 273 ft