

**RED RIVER  
GROUNDWATER  
CONSERVATION  
DISTRICT**

**PERMIT HEARING AND BOARD MEETING**

Greater Texoma Utility Authority Board Room  
5100 Airport Drive  
Denison, Texas 75020

THURSDAY  
FEBRUARY 15, 2024  
10:00 AM

NOTICE OF PUBLIC MEETING  
OF THE  
BOARD OF DIRECTORS OF THE

**RED RIVER GROUNDWATER CONSERVATION DISTRICT**  
**Thursday, February 15, 2024, at 10:00 a.m.**

**MEETING LOCATION:**  
**Greater Texoma Utility Authority Board Room**  
**5100 Airport Drive**  
**Denison, Texas 75020**

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**Permit Hearing**

The Permit Hearing will begin at 10:00 a.m.

Notice is hereby given that the Board of Directors of the Red River Groundwater Conservation District (“District”) will conduct a permit hearing on the following Production Permit Application:

**Agenda:**

1. Call to Order; establish quorum; declare hearing open to the public; introduction of Board.
2. Review the Production Permit Application of:

**New Production Permits**

- a. **Applicant:** City of Trenton; 216 Hamilton St, Trenton, TX 75490

**Location of Wells:**

- **North Well:** 212 Washington, Trenton, TX 75490; Latitude: 33.43649°N Longitude: 96.33992°W; about 150 feet south of Hwy 121, and about 840 feet west of Hwy 69, in Fannin County.
- **East Well:** 208 2<sup>nd</sup> St, Trenton, TX 75490; Latitude: 33.43054°N Longitude: 96.33807°W; at the intersection of May St and N 2<sup>nd</sup> St, in Fannin County.
- **Hwy 69 Well:** Hwy 69, Trenton, TX 75490; Latitude: 33.424602°N Longitude: 96.327290°W; about 420 feet west of Hwy 69, and about 1,650 feet south of CR 4605, in Fannin County.

**Purpose of Use:** Municipal/Public Water System

**Requested Amount of Use:** 117,177,321 gallons per year

**Production Capacity of Wells:**

- North Well: 165 gallons per minute
- East Well: 160 gallons per minute
- Hwy 69 Well: 425 gallons per minute

**Aquifer:** Woodbine

b. **Applicant:** City of Bells; 203 S. Broadway St, Bells, TX 75414

**Location of Wells:**

- **Well 4 (existing):** E South St/S Commercial St, Bells, TX 75414; Latitude: 33.608208°N Longitude: 96.40863°W; about 970 feet south of Hwy 56, at the intersection of E South St and S Commercial St, in Grayson County.
- **Well 6 (new):** 101 1/2 North Broadway St., Bells, TX 75414; Latitude: 33.610528°N Longitude: 96.408604°W; about 110 feet south of Hwy 56, and about 575 feet east of N Broadway St, in Grayson County.

**Purpose of Use:** Municipal/Public Water System

**Requested Amount of Use:** 66,760,075 gallons per year

**Production Capacity of Wells:**

- Well 4: 250 gallons per minute
- Well 6: 350 gallons per minute

**Aquifer:** Trinity (Antlers)

3. Public Comment on the Production Permit Application (verbal comments limited to three (3) minutes each).
4. Consider and act upon the Production Permit Application, including designation of parties and/or granting or denying the Production Permit Application in whole or in part, as applicable.
5. Adjourn or continue permit hearing

## **Board Meeting**

The regular Board Meeting will begin upon adjournment of the above noticed Permit Hearing.

Notice is hereby given that the Board of Directors of the Red River Groundwater Conservation District (“District”) may discuss, consider, and take all necessary action, including expenditure of funds, regarding each of the agenda items below:

### **Agenda:**

1. Pledge of Allegiance and Invocation.
2. Call to order, establish quorum; declare meeting open to the public.
3. Public Comment.
4. Consider and act upon approval of Minutes of December 21, 2023, Board Meeting.
5. Budget and Finance.
  - a. Review and approval of monthly invoices.
  - b. Receive monthly financial information.
  - c. Receive Quarterly Investment Report.
6. Receive Quarterly Report on Management Plan.
7. Update and possible action regarding the process for the development of Desired Future Conditions (DFC).
8. Discussion and possible action letter explaining the Historic Use Permits.
9. Consider and act upon the selection of a consultant for database services to maintain and improve the District’s database.
10. Consider and act upon compliance and enforcement activities for violations of District Rules.
11. General Manager’s report: The General Manager will update the Board on operational, educational and other activities of the District.
  - a. Well Registration Summary
  - b. Update on Injection/Disposal Well Monitoring Program
  - c. Update on District Staff
12. Open forum / discussion of new business for future meeting agendas.
13. Adjourn.

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<sup>1</sup>The Board may vote and/or act upon each of the items listed in this agenda.

<sup>2</sup>At any time during the meeting or work session and in compliance with the Texas Open Meetings Act, Chapter 551, Government Code, Vernon’s Texas Codes, Annotated, the Red River Groundwater

*Conservation District Board may meet in executive session on any of the above agenda items or other lawful items for consultation concerning attorney-client matters (§551.071); deliberation regarding real property (§551.072); deliberation regarding prospective gifts (§551.073); personnel matters (§551.074); and deliberation regarding security devices (§551.076). Any subject discussed in executive session may be subject to action during an open meeting.*

<sup>3</sup> *Persons with disabilities who plan to attend this meeting, and who may need assistance, are requested to contact Velma Starks at (800) 256-0935 two (2) working days prior to the meeting, so that appropriate arrangements can be made.*

<sup>4</sup> *For questions regarding this notice, please contact Velma Starks at (800) 256-0935, at [rrgcd@redrivergcd.org](mailto:rrgcd@redrivergcd.org) or at 5100 Airport Drive, Denison, TX 75020.*

ATTACHMENT 4

**MINUTES OF THE BOARD OF DIRECTORS' BOARD MEETING  
RED RIVER GROUNDWATER CONSERVATION DISTRICT**

**Thursday, December 21, 2023**

**MEETING LOCATION:  
GREATER TEXOMA UTILITY AUTHORITY  
BOARD ROOM  
5100 AIRPORT DRIVE  
DENISON TX 75020**

Members Present: Chuck Dodd, Harold Latham, Mark Patterson, Mark Gibson, and Billy Stephens.

Members Absent: Mark Newhouse and David Gattis

Staff: Paul Sigle, Nichole Murphy, Wayne Parkman, Kenneth Elliott, and Allen Burke,

Visitors: Kristen Fancher, Fancher Legal

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**Permit Hearing**

**Agenda:**

1. Call to Order; establish quorum; declare hearing open to the public; introduction of Board.

Board President Mark Patterson called the Permit Hearing to order at 10:00 a.m., established quorum declared hearing open to the public and introduced the Board.

2. Review the Production Permit Application of:

**New Production Permit**

- a. **Applicant:** City of Trenton; 216 Hamilton St, Trenton, TX 75490  
**Location of Well:** Hwy 69, Trenton, TX 75490; Latitude: 33.424602°N Longitude: 96.327290°W; about 420 feet west of Hwy 69, and about 1,650 feet south of CR 4605, in Fannin County.  
**Purpose of Use:** Municipal/Public Water System  
**Requested Amount of Use:** 117,177,321 gallons per year  
**Production Capacity of Well:** 425 gallons per minute  
**Aquifer:** Woodbine

General Manager Paul Sigle provided information for the Board. Discussion was held.

3. Public Comment on the Production Permit Application (verbal comments limited to three (3) minutes each).

No public comments.



4. Consider and act upon the Production Permit Application, including designation of parties and/or granting or denying the Production Permit Application in whole or in part, as applicable.

Chuck Dood made a motion to Table the Permit Application for more information from the City of Trenton. Billy Stephens seconded.

5. Adjourn or continue permit hearing

Board President Mark Patterson adjourned the permit hearing at 10:12 a.m.

### **Board Meeting**

1. Pledge of Allegiance and Invocation.

Board President Mark Patterson led the group in the Pledge of Allegiance and Board Member Chuck Dodd offered the invocation for the group.

2. Call to order, establish quorum; declare meeting open to the public.

Board President Mark Patterson called the meeting to order at 10:12 a.m., established a quorum was present, and declared the meeting open to the public.

3. Consider and act upon election of Officers.

Skipped. This was a mistake

4. Public Comment.

No Public Comment.

5. Consider and act upon approval of Minutes of October 19, 2023, Board Meeting.

Board Member Chuck Dodd made a motion to approve the minutes of October 19, 2023, meeting. The motion was seconded by Board Member Mark Gibson. Motion passed unanimously.

6. Budget and Finance.

- a. Review and approval of monthly invoices.

General Manager Paul Sigle reviewed the invoices with the Board. Discussion was held. Board Member Billy Stephens made the motion to approve the monthly invoices. Board Member Mark Gibson seconded the motion. Motion passed unanimously.

- b. Receive monthly financial information.

General Manager Paul Sigle reviewed the District's monthly financial information with the Board.



7. Consider and act upon the Administrative Service Contract with the Greater Texoma Utility Authority.

General Manager Paul Sigle provided information to the Board.

Harold Latham made the motion and Mark Gibson made the second. Motion Passed Unanimously.

8. Update and possible action regarding the process for the development of Desired Future Conditions (DFC).

General Manager Paul Sigle provided information for the Board.

No action was taken.

9. Discussion and possible action regarding sending letters to municipalities discussing options for wells being proposed to be drilled within city boundaries

General Manager Paul Sigle provided information for the Board.

Chuck Dodd made motion to send the letter. Mark Gibson seconded. Motion passed unanimously.

10. Discussion and possible action regarding issuing Historic Use Permits for Non-Exempt Well Owners.

General Manager Paul Sigle and Legal Counsel Kristin Fancher provided information to the Board. Many citizens had comments

No action was taken

11. Consider and act upon compliance and enforcement activities for violations of District Rules.
  - a. Tioga ISD

Board went into executive session at 11:18 am.

Board reconvened at 11:40 am. No action was taken.

12. General Manager's report: The General Manager will update the Board on operational, educational, and other activities of the District.

- a. Well Registration Summary

General Manager Paul Sigle reviewed the well registration summary with the Board. 8 new wells were registered in October and 4 new wells were registered in November.

- b. Update on Injection/Disposal Well Monitoring Program

13. Open forum / discussion of new business for future meeting agendas.

No discussion.

11. Adjourn.

Board President Mark Patterson declared the meeting adjourned at 11:40 a.m.

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\_\_\_\_\_  
Recording Secretary

\_\_\_\_\_  
Secretary-Treasurer

ATTACHMENT 5 a.

RESOLUTION NO. 2024-01-01

A RESOLUTION BY THE BOARD OF DIRECTORS OF THE RED RIVER GROUNDWATER CONSERVATION DISTRICT AUTHORIZING PAYMENT OF ACCRUED LIABILITIES FOR THE MONTHS OF DECEMBER AND JANUARY

The following liabilities are hereby presented for payment:

	<u>Amount</u>
<b><u>Administrative Services</u></b>	
GTUA - December 2023	11,306.37
GTUA - January 2024	11,201.05
<b><u>Direct Costs</u></b>	
NexTraq - GPS Service for January 2024	40.65
NexTraq - GPS Service for February 2024	36.95
<b><u>GMA-8 Fees</u></b>	
NTGCD - 2023 Intera expenses for Northern Trinity & Woodbine Aquifer GAM Update Oct - Nov 2023	19,445.03
NTGCD - 2023 Intera expenses for Northern Trinity & Woodbine Aquifer GAM Update Sept. 2023	4,996.00
<b><u>Injection Well Monitoring</u></b>	
Statewide Plat Service - Monthly service charge for November 2023	50.00
Statewide Plat Service - Monthly service charge for December 2023	50.00
<b><u>Insurance</u></b>	
Bayless Hall - Blanket Bond for Board renewal 3/14/24-3/14/25	315.00
<b><u>Legal</u></b>	
Fancher Law - BOD general legal services through Dec 2023 - Jan 2024	4,968.00
<b><u>Meetings &amp; Conferences</u></b>	
Feast On This - December BOD Lunch	207.00
<b><u>Refunds</u></b>	
Riverby Flats - account correction	63.32
<b>GRAND TOTAL:</b>	<b><u><u>52,679.37</u></u></b>

NOW THEREFORE BE IT RESOLVED BY THE BOARD OF DIRECTORS OF THE RED RIVER GROUNDWATER CONSERVATION DISTRICT THAT the Secretary-Treasurer is hereby authorized to make payments in the amounts listed above.

On motion of \_\_\_\_\_ and seconded by:

\_\_\_\_\_, the foregoing Resolution was passed and approved on this, the 15th. day of February 2024

by the following vote:

AYE:

NAY:

At a meeting of the Board of Directors of the Red River Groundwater Conservation District.

\_\_\_\_\_  
President

ATTEST:

\_\_\_\_\_  
Secretary/Treasurer



ATTACHMENT 5 b.

**RED RIVER GROUNDWATER**  
**Balance Sheet**  
As of January 31, 2024

**ASSETS**

**Current Assets**

**Checking/Savings**

10001 CASH-First United	274,516.05
10005 BANK OZK CDRS	142,296.45
10025 A/R CONSUMPTION	77,358.02
10230 A/R Violation Fees	500.00
10101 ALLOWANCE FOR UNCOLLECT	-1,530.00
10010 INVESTMENTS	506,275.68
10230 PP EXPENSES	1,966.50

**TOTAL ASSETS** **1,001,382.70**

**LIABILITIES & EQUITY**

**Liabilities**

**Current Liabilities**

**Accounts Payable**

23100 ACCOUNTS PAYABLE	21,265.05
23150 DRILLERS DEPOSIT LIAB	15,357.62

**Total Other Current Liabilities** **36,622.67**

**Total Current Liabilities** **36,622.67**

**Total Liabilities** **36,622.67**

**Equity**

35100 RETAINED EARNINGS 978,005.44

Net Income -13,245.41

**Total Equity** **964,760.03**

**TOTAL LIABILITIES & EQUITY** **1,001,382.70**

**RED RIVER GROUNDWATER**  
**Profit & Loss Budget vs. Actual**  
January 31, 2024

	<u>Current Actual</u>	<u>Current Budget</u>	<u>YTD Actual</u>	<u>Total Budget</u>	<u>% of Budget Remaining</u>
<b>Income</b>					
46002 GW PRODUCTION	0.00	0.00	0.00	326,769.23	100.00%
46005 LATE FEES	0.00	0.00	0.00	0.00	0.00%
46006 VIOLATION FEES	0.00	0.00	0.00	0.00	0.00%
46015 REGISTRATION FEES	300.00	833.00	300.00	10,000.00	97.00%
46020 PERMITTING FEES	0.00	583.00	0.00	7,000.00	0.00%
46100 INTEREST INCOME	0.00	1,333.00	0.00	16,000.00	100.00%
<b>Total Income</b>	<u>300.00</u>	<u>2,749.00</u>	<u>300.00</u>	<u>359,769.23</u>	<u>99.92%</u>
<b>Gross Profit</b>	300.00	2,749.00	300.00	359,769.23	
<b>Expense</b>					
77010 ADMINISTRATIVE COST	4,066.00	8,750.00	4,066.00	105,000.00	96.13%
77020 ADVERTISING	4.00	83.00	4.00	1,000.00	99.60%
77027 AUDITING	0.00	0.00	0.00	5,700.00	100.00%
77031 BANKING FEES	0.61	83.00	0.61	1,000.00	99.94%
77032 CONTRACT SERVICES	0.00	4,392.00	0.00	52,702.39	100.00%
77035 FIELD TECH	4,338.00	5,417.00	4,338.00	65,000.00	93.33%
77040 DIRECT COST	0.60	375.00	0.60	4,500.00	99.99%
77045 FIELD PERMITTING SPECIAL	2,162.00	2,917.00	2,162.00	35,000.00	93.82%
77450 DUES & SUBSCRIPTIONS	0.00	333.00	0.00	4,000.00	100.00%
77480 EQUIPMENT	0.00	167.00	0.00	2,000.00	100.00%
77500 FEES-GMA8	0.00	0.00	0.00	181.82	100.00%
77810 INSURANCE AND BONDING	327.75	367.00	327.75	4,410.00	92.57%
77850 GENERIC SOFTWARE SVC	0.00	208.00	0.00	2,500.00	100.00%
77970 LEGAL	2,016.00	1,250.00	2,016.00	15,000.00	86.56%
78010 MEETINGS AND CONFEREN	105.00	500.00	105.00	6,000.00	98.25%
78310 RENT	200.00	200.00	200.00	2,400.00	91.67%
78600 SOFTWARE MAINTENANCE	0.00	4,167.00	0.00	50,000.00	100.00%
78750 TELEPHONE	257.01	250.00	257.01	3,000.00	91.43%
78770 - TRANSPORTATION	68.44	417.00	68.44	5,000.00	98.63%
<b>Total Expense</b>	<u>13,545.41</u>	<u>29,876.00</u>	<u>13,545.41</u>	<u>364,394.21</u>	<u>96.28%</u>
<b>Net Income</b>	<u><u>-13,245.41</u></u>	<u><u>-27,127.00</u></u>	<u><u>-13,245.41</u></u>	<u><u>-4,624.98</u></u>	

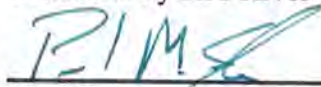


ATTACHMENT 5 c.

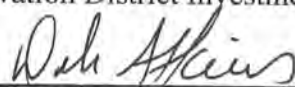
Red River Groundwater Conservation District  
Quarterly Investment Report  
For the Quarter Ended  
December 31, 2023

The investment portfolio of the Red River Groundwater Conservation District is in compliance with the Public Funds Investment Act and the Investment Policy and Strategies.

Presented by Red River Groundwater Conservation District Investment Officers:



Paul Sigle  
General Manager



Debi Atkins  
Finance Officer

Investment Holdings  
12/31/2023

Description	Ratings	Coupon/ Discount	Maturity Date	Settlement Date	Face Amount/Par Value	Book Value	Market Price	Market Value	Life (Day)	Yield
First United (DDA)		0.00%	1/1/2024	12/31/2023	\$ 301,986.34	\$ 301,986.34	1.00	\$ 301,986.34	1	0.00%
East West (CD)		5.00%	2/26/2024	2/24/2023	\$ 250,000.00	\$ 250,000.00	1.00	\$ 250,000.00	57	5.13%
EastWest (CD)		5.65%	8/26/2024	8/24/2023	\$ 256,275.68	\$ 256,275.68	1.00	\$ 256,275.68	368	5.65%
OZK (CDARS)		5.45%	6/14/2024	6/14/2023	\$ 142,296.45	\$ 142,296.45	1.00	\$ 142,296.45	366	5.45%
Weighted Ave Maturity in yrs					\$ 950,558.47	\$ 950,558.47			58	
									(1)	0.46

(1) Weighted average life - For purposes of calculating weighted average life, bank accounts, pools and money market funds are assumed to have an one day maturity.

Book/Market Value Comparison

Description	Coupon/ Discount	Maturity Date	September 30, 2023		December 31, 2023			
			Face Amount/ Par Value	Book/Market Value	Sales/Adjust/ Call Maturity	Face Amount/ Par Value	Book/Market Value	
					Purchases/ Adjustments			
First United (DDA)	0.00%	1/1/2024	241,319.78	241,319.78	128,916.05	68,249.49	301,986.34	\$ 301,986.34
East West (CD)	5.65%	8/26/2024	256,275.68	256,275.68			256,275.68	\$ 256,275.68
East West (CD)	5.00%	2/26/2024	250,000.00	250,000.00			250,000.00	\$ 250,000.00
OZK (CDARS)	5.45%	6/14/2024	138,500.00	138,500.00	\$ 3,796.45		142,296.45	\$ 142,296.45
			\$ 886,095.46	\$ 886,095.46	\$ 132,712.50	\$ 68,249.49	\$ 950,558.47	\$ 950,558.47



ATTACHMENT 6



# RED RIVER GROUNDWATER CONSERVATION DISTRICT



FANNIN COUNTY AND GRAYSON COUNTY

## General Manager's Quarterly Report Date: December 31, 2023 Red River GCD Management Plan

This quarterly briefing is being provided pursuant to the adopted Management Plan for the quarter ending December 31, 2023.

### Well Registration Program:

Current number of wells registered in the District: **1,184**

Aquifers in which the wells have been completed: Trinity and Woodbine

### Well Inspection/Audit Program:

**2023**

#### Well Inspections

Month	Fannin	Grayson	Total
January	0	18	18
February	9	20	29
March	6	22	28
April	5	7	12
May	0	5	5
June	0	6	6
July	4	3	7
August	5	8	13
September	4	2	6
October	1	7	8
November	17	10	27
December	2	9	11
<b>Total</b>	<b>53</b>	<b>117</b>	<b>170</b>

**Number of Exempt wells inspected (as of December 31, 2023)**

<b>County</b>	<b>Number of Wells Inspected (2023)</b>	<b>Total Number of Completed Wells*</b>	<b>%</b>
<b>Fannin</b>	28	283	<b>10%</b>
<b>Grayson</b>	50	547	<b>9%</b>
<b>Total</b>	<b>78</b>	<b>830</b>	<b>9%</b>

**Number of Non-Exempt wells inspected (as of December 31, 2023)**

<b>County</b>	<b>Number of Wells Inspected (2023)</b>	<b>Total Number of Completed Wells*</b>	<b>%</b>
<b>Fannin</b>	17	94	<b>18%</b>
<b>Grayson</b>	63	223	<b>28%</b>
<b>Total</b>	<b>80</b>	<b>317</b>	<b>25%</b>

\*Plugged wells have been excluded

\*Total number of completed wells is estimated.

- Assumptions
  - Wells that have completion dates are assumed to be complete.
  - Wells with application dates through 9/7/2022 are assumed to be complete.
  - Wells that have been inspected are assumed to be complete.



ATTACHMENT 9





## **STATEMENT OF QUALIFICATIONS**

**NORTH TEXAS GROUNDWATER  
CONSERVATION DISTRICT &  
RED RIVER GROUNDWATER  
CONSERVATION DISTRICT**

**CONSULTING SERVICES, CUSTOM PROGRAMMING  
& INTEGRATION SERVICES RELATED TO A WATER  
WELL MANAGEMENT SYSTEM**

December 15, 2023





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## Appendix A: Key Personnel Resumes

December 15, 2023

Paul Sigle, General Manager  
North Texas Groundwater Conservation District  
Red River Groundwater Conservation District  
5100 Airport Dr.  
Denison, TX 75020  
Submitted Via Email: [paul@gtua.com](mailto:paul@gtua.com)



**RE: Consulting Services, Custom Programming and Integration Services Related to a Water Well Management System**

Dear Mr. Sigle and Members of the GCD Boards,

Since their creation, the North Texas Groundwater Conservation District (NTGCD) and Red River Groundwater Conservation District (RRGCD, collectively “the Districts”) have made tremendous progress in their missions to conserve, preserve, recharge, and prevent waste of groundwater within north Texas. We recognize that an effective database and data management system is an essential part of meeting these goals efficiently. To keep pace with permitting demands and requests for information, user friendly public-facing tools that integrate with your internal administrative processes are important. Just as important is having secure, internal system tools that support workflows, empower you to query your data at will, and allow you to extract reports and displays from analytical tools based on real hydrological data and science. We also understand that the Districts’ internal processes and workflows change over time, and your system must be able to adapt over time to stay relevant. LRE Water is uniquely suited to work with the Districts to improve your existing well data management system (currently DripDrop), and create a more-reliable and flexible application customized to your needs.

**LRE Water** brings the following qualifications to meet the Districts’ Water Well Management System request:

- **Database Design Expertise:** LRE Water has a proven track record of successfully developing integrated database and dashboard applications for multiple entities across the country. Our recent and ongoing work for other Groundwater Conservation Districts (GCDs), including Barton Springs (BSEACD), Clearwater (CUWCD) and North Plains (NPGCD), provides our team an invaluable understanding of GCD-specific groundwater data management, permitting, reporting, analysis, and integrated mapping needs. We have already developed a broad suite of tools to support these districts which we can adapt for the Districts, allowing us to focus on the new functionalities you need, rather than spending time building tools from scratch.
- **Groundwater Backgrounds:** As hydrogeology professionals, we not only build and support these systems, we use them too, and we understand the importance of data-driven management of groundwater resources. We know how to organize and communicate technical information effectively to assist managers and engage stakeholders. We have decades of collective professional experience and we move beyond just storing and visualizing your data, to analysis of that data to help you understand what it means for the Districts and management of the groundwater resources.
- **In-Depth Knowledge of Local Aquifers and Issues:** We have extensive knowledge of the complex hydrogeology of the Trinity Aquifer and we understand the issues facing the Districts related to population growth, reduced water levels, and drought management. We will incorporate our local knowledge when enhancing your existing well data management system to include functionality that can help you effectively manage and monitor water levels and pumping, protect groundwater resources, as well as tackle other important issues and challenges.

We believe that communication and collaboration is key to successful project execution, and we will implement a rigorous project management approach that ensures timely communication, and efficient execution to meet project goals on time and within budget. We commit to: providing extraordinary levels of service; responding rapidly to calls/emails; and participating in person at meetings as requested. We plan on coordinating an initial project meeting in which we observe Districts’ staff working with your current system, to better understand your workflow and existing functionality you have now can be improved to better meet staff needs. Please do not hesitate to contact us with any questions about our qualifications and services offered to the Districts. As our development team lead, you may reach me directly at [Kelly.Close@LREWater.com](mailto:Kelly.Close@LREWater.com) or 720-301-3728.

Sincerely,

A handwritten signature in blue ink that reads 'K. Kelly Close'.

**Kelly Close, PE**  
System Design and Development Team Lead

A handwritten signature in black ink that reads 'Jordan Furnans'.

**Jordan Furnans, PhD, PE, PG**  
Project Manager, Vice President - TX Operations

# GENERAL DESCRIPTION OF COMPANY

Leonard Rice Consulting Water Engineers, LLC (d/b/a LRE Water) is an interdisciplinary company with a 90+ person staff focused on bringing creative solutions to water issues. For 53 years, LRE Water has provided leadership in engineering and consulting services related to planning, managing, and developing water resources throughout the western United States. It is this unique combination of leadership and technical expertise that our clients rely upon when planning for and managing their most precious resource: *water*.

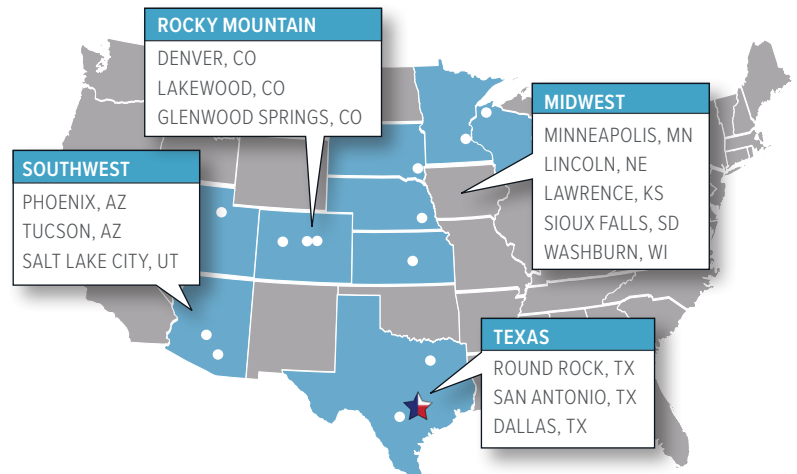
**LRE Water, LLC** was created in 2015 as the Texas-based office of LRE Water. Dr. Jordan Furnans, PE, PG leads our Texas office and has over 22 years of experience in Texas water resources. LRE Water, LLC is an established leader in providing accurate groundwater and surface water science to the Texas marketplace. We are continuously expanding our services to meet the water resources needs of clients throughout Texas, and have become a premier Central Texas-based boutique firm offering industry-leading consulting services for surface water and groundwater resources.

## FINANCIAL CAPABILITY AND STABILITY

So far in 2023, gross revenue from LRE Water exceeded \$17M, including over \$2M in net revenue from Texas projects. We have the financial capability and stability to provide the requested services to the Districts.

## OFFICE LOCATIONS

LRE Water maintains 14 offices across four regions of the United States. Our Texas staff members specialize in water resource modeling, aquifer characterization, groundwater exploration, and master planning for a variety of public and private clients throughout Texas.



## FIRM PRINCIPLES

Our vision is to be the gold standard in the water community by bringing innovative solutions to our clients and partners through our dedicated team of experts. Guiding principles of our firm are represented in six Core Values.

### LRE WATER CORE VALUES

**EVERYONE IS ESSENTIAL** - We treat everyone with mutual respect and professionalism. Each of us is essential and no one is "above the law". Our reputation depends as much on how people feel when they work with us as it does the quality of our work.

**EXCELLENCE** - We endeavor to consistently do our best, and value self-motivation and continuous improvement. Excellence is our attitude.

**OWNERSHIP** - We take ownership of our responsibilities and mistakes, and we are vested in the success of our company, co-workers, and clients.

**CONTINUITY** - We are intentional about perpetuating the firm and 'being there' for our clients and co-workers. Our long-term relationships are based on mutual respect and benefit.

**BALANCE** - We strive to maintain a balanced workforce and promote a healthy work-life balance for employees.

**PASSION** - We have a genuine passion for water/ natural resources and supporting our clients. Because of this passion, we are willing to go the extra mile to assist a client and to ensure that a project is successful.

# COMPANY PROFILE

<b>Firm Name</b>	LRE Water, LLC (a subsidiary of LRE Water)
<b>Regional HQ Address</b>	1101 Satellite View #301, Round Rock, TX 78665
<b>Name of Parent Company</b>	LRE Water
<b>Former Names of Parent Company</b>	Leonard Rice Consulting Water Engineers, Inc., Leonard Rice Engineers
<b>Address of Parent Company</b>	1221 Auraria Pkwy, Denver, CO 80204
<b>Type of Ownership</b>	Limited Liability Corporation
<b>Year of Establishment</b>	LRE Water: 1970 / LRE Water, LLC: 2015
<b>Authorized Signer</b>	Cortney Brand, President/CEO
<b>Primary Contact</b>	Jordan Furnans, Vice President/Manager of Texas Operations
<b>Phone Number</b>	512-736-6485
<b>Fax Number</b>	N/A
<b>Email Address</b>	Jordan.Furnans@LREwater.com

## FIRM PRINCIPALS

<b>Name and Title</b>	<b>Contact Information</b>
<b>Cortney Brand</b> President / CEO	1221 Auraria Parkway Denver, CO 80204 303-455-9589
<b>Mary Presecan</b> Senior Project Manager / Chief Business Development Officer	1221 Auraria Parkway Denver, CO 80204 303-455-9589
<b>Bill Fronczak</b> Vice President, Risk Management	1221 Auraria Parkway Denver, CO 80204 303-455-9589
<b>Gary Gin</b> Vice President, ASR Practice Lead	11811 North Tatum Boulevard Suite 1026 Phoenix, AZ 78665 602-237-6769
<b>Janet Williams</b> Business Unit Manager	1221 Auraria Parkway Denver, CO 80204 303-455-9589
<b>Jeremy Wescoat</b> Chief Financial Officer	1221 Auraria Parkway Denver, CO 80204 303-455-9589
<b>Carolyn Nobel</b> Chief Operating Officer	1221 Auraria Parkway Denver, CO 80204 303-455-9589

### SERVICES OFFERED



Groundwater,  
Geology &  
Hydrogeology



Data Visualization  
& Web-Based  
Tools



Data Integration,  
Modeling &  
Technology



Water Resources  
Planning



Regulatory  
Compliance &  
Environmental  
Permitting



Water Quality &  
Environmental  
Monitoring



Water Rights  
Engineering



Watershed  
Planning



# GENERAL STATEMENT OF QUALIFICATIONS



*Jacob's Well Swimming Hole predating more recent spring flow reductions.*

LRE Water is a recognized leader in groundwater evaluations and modeling as well as the development of client-specific management and visualization tools. We are actively engaged in the development of integrated mapping systems for the Clearwater Underground Water Conservation District (CUWCD), Barton Springs Edwards Aquifer Conservation District (BSEACD) and North Plains Groundwater Conservation District (NPGCD). We also provide Goliad County Groundwater Conservation District (GCGCD), Middle Pecos Groundwater Conservation District (MPGCD), and Lost Pines Groundwater Conservation District (LPGCD) with hydrogeologic consulting services. We are developing 3-Dimensional hydrogeologic models for the Middle Trinity Groundwater Conservation (MTGCD), LPGCD, and a consortium of multiple entities within the Central Texas region, that includes portions of Travis, Williamson, and Burnet Counties.

**LRE Water will approach the creation of a data management and interactive mapping systems for the Districts by first listening to your needs. We do not believe in “one-size-fits-all” management tools when it comes to the highly localized and incredibly important groundwater management issues that need to be addressed and managed with these tools.**

## HYDROGEOLOGICAL SERVICES

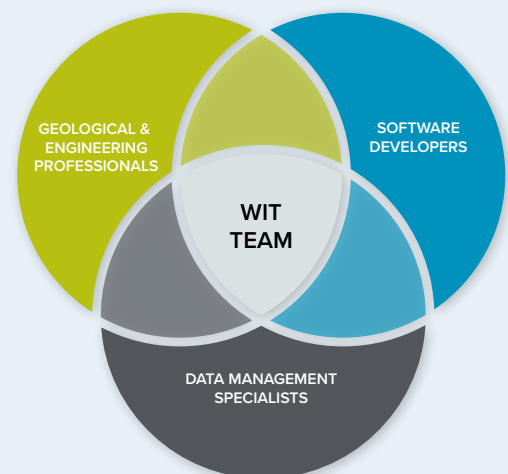
The LRE Water Groundwater Team has a long history serving our clients' needs for groundwater resource development and management. We specialize in providing both preliminary and detailed water reliability assessments, performing well and well-field design, construction, testing, rehabilitation, and optimization. Our groundwater services include innovative solutions that provide water storage and water quality improvements like aquifer storage and recovery (ASR), soil aquifer treatment, and riverbank filtration. At LRE Water, we also understand that managing groundwater can be a complex consideration of many factors including hydraulic, structural, and lithologic characteristics of the aquifer, while also considering the quality of the groundwater relative to its proposed use.

## WATER INFORMATION TECHNOLOGY TEAM

Our Water Information Technology (WIT) Team was created by Kelly Close, PE. Since 2007, the WIT Team has been developing customized data management, display and mapping tools throughout the western United States. We are an interdisciplinary group of water professionals with additional expertise in database design, data management, modeling, and software development. We have a deep passion for developing functional and aesthetic systems and websites that effectively communicate complex technical information.

The WIT Team has applied their expertise to develop tools for a diverse set of clients ranging from Federal, State, and local government entities to nonprofits and community organizations. We leverage non-proprietary software to keep maintenance costs low, and we apply Agile project management and open communication to engage clients in the design and development of their systems at every step.

**At LRE Water, our Water Information Technology (WIT) Team goes beyond traditional software development, synergistically combining engineering, data management expertise, and leading-edge software development techniques to create smart solutions for water management that really work.**





# QUALIFICATIONS OF THE TEAM AND WORK EXPERIENCE

As detailed in the “Services Proposed for this Solicitation” section of the RFQ, the Districts envision utilizing a secure web-based data management system with capabilities that will ease the ability of staff to effectively and efficiently manage groundwater within their jurisdiction. Creation of such a system requires both programming expertise AND a detailed understanding of the geology, engineering, and organization requirements of the Districts. The LRE Water team has expertise in all of these areas, as we’ve proven through our recent work with GCDs across Texas.

On each of our projects with NPGCD, BSEACD, and CUWCD, we have made it a point to have detailed initial meetings with each District, to clearly understand their needs and system requirements. This allowed us to suggest appropriate system components and to scale the projects to meet the immediate needs of each client. Discussions involved both the database system components and output and reporting needed by each district. We also discussed district wishes for groundwater analysis tools we could potentially create. Some examples of deliverables that resulted from this approach included:

- Virtual Well Bore tool,
- Customized water quality reporting tools,
- Graphical and text-based analysis of time-series trends,
- Well, permit and owner database management systems,
- Interactive web-based GIS tools, and
- Data input forms that have eased reporting burdens for registered well owners.

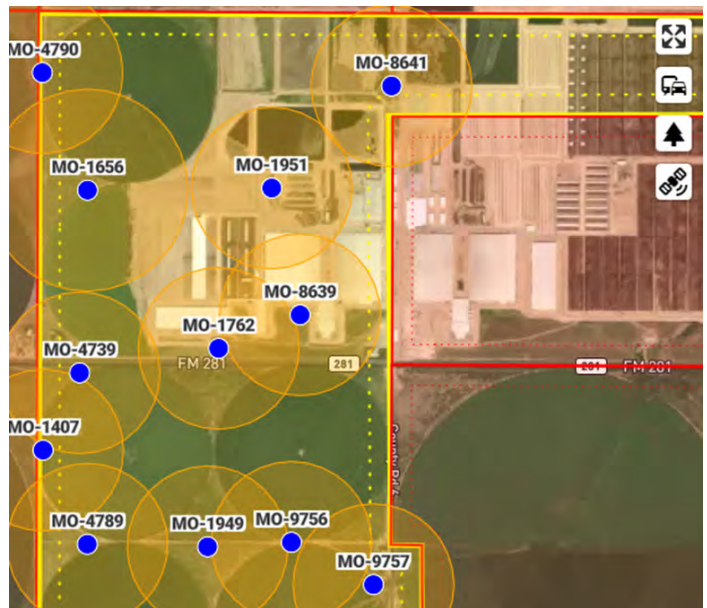
For the Districts we pledge to conduct a project scoping meeting early in the project, to fully vet deliverables and ensure we provide the desired project outcomes. This includes all of the outcomes listed in the RFQ, but also may include additional items the LRE Water team believes to be of value. For example, we envision creating a desired future conditions (DFC) compliance tool, which would allow staff to compare managed drawdown against the defined goals of GMA-8. As currently written, the DFCs for aquifers within the Districts’ jurisdiction are based on average drawdown defined for each formation over the entire district area. Hence we’d envision development of a drawdown assessment tool applicable to wells within the Districts’ database, from which district-wide average drawdown is automatically computed. This would have to be augmented with similar data from the entire GMA-8 region in order to fully assess DFC compliance; this would be an interesting challenge to overcome over the course of the project.

**Please find several project examples detailing similar work experience in "Description of Previous Work" section.**

## RESUMES

**Resumes for LRE Water team members expected to work on this project are provided in [Appendix A](#).**

Our proposed team will be fully supported by the entire 90+ LRE Water nationwide staff, including local as-needed support from experienced hydrogeologists Vince Clause, PG, Allan Standen, PG, and Theresa Budd, PG. Our project manager, Jordan Furnans, PhD, PE, PG will have full authority to utilize all LRE Water staff as needed to complete tasks for the Districts.



*Custom "Well Buffering" tool developed for NPGCD supporting evaluation of new well applications.*

# KEY PERSONNEL

While we will assign LRE Water staff to project tasks based on project requirements and respective staff skills, we expect to manage and complete the project using key personnel from both our Round Rock, TX office and our Denver, CO office. Our Round Rock office includes 7 staff members and is located within a 4-hour drive from the District offices. We also will utilize a staff member located in Dallas, who can be present as needed at District offices or in board meetings to discuss project progress and report results/receive feedback. We will not hesitate to be present when needed and requested by District Staff.

## EXPERIENCE & QUALIFICATIONS OF KEY PERSONNEL



### **JORDAN FURNANS, PHD, PE, PG | PROJECT MANAGER**

Jordan will lead this project for the Districts, and will serve as the administrative point of contact, provide project oversight, and coordinate staff efforts to ensure efficient team operation and project completion meeting deadlines and task budgets. Jordan is the head of LRE Water in Texas and manages all TX-based staff and offices. He will also provide expertise and oversight related to hydrogeological sciences pertinent to the further development of the groundwater management system. Jordan is a TX-licensed engineer and geologist, and has been developing groundwater and surface water resources in Texas since 2004. Jordan also teaches an undergraduate course in engineering hydraulics at The University of Texas at Austin.



### **KELLY CLOSE, PE | SYSTEM DESIGN AND DEVELOPMENT TEAM LEAD**

Kelly will lead the system design and development team for this project. Kelly has been leveraging databases and programming since the early 1990s to meet water planning and management challenges. Her passion is finding better ways to turn data into useful information, streamline data-driven analysis and reporting, and support efficient and timely water management decisions and operations. Her diverse background includes water rights accounting, modeling, GIS, water quality analysis, field data collection, and permitting. Kelly has led similar project efforts for BSEACD, NPGCD, and CUWCD.



### **WALLACE DARLING, GIT | STAFF HYDROGEOLOGIST AND ANALYTICS SPECIALIST**

Wally will support database development, system analytics and customized tools programming. Wally has subject matter expertise in well field design, numerical data processing and visualization, field data collection and interpretation and environmental remediation. He works with programming languages such as R and Python, and web frameworks (such as Django) to build tools for interpretation, analysis, display and reporting of geologic and hydrologic data.



### **MICHAEL BARRY | FULL STACK WEB DEVELOPER**

Michael is a “full-stack” web developer who builds web tools from the ground up. Many traditionally trained web developers specialize in just a focused slice of the website coding process, but Michael understands how the different components of a data management system fit together and is able to work seamlessly with engineers, scientists and database developers to build clean and user friendly tools. While Michael will primarily lead the User Interface development work, he will also assist in database development efforts. Michael has worked on similar project efforts for BSEACD, NPGCD, and CUWCD.



**TIM SALAZAR | DATABASE PROGRAMMER**

Tim is a "full-stack" data scientist experienced in data engineering, programming, and statistical methods development, with a background in Geography, Ecology, Hydrology and Water Resources. Tim support's LRE Water's cloud systems development and security management, provides database programming and automation support, and adds to LRE's expertise in the programing analytical methods into custom tools. He has experience developing in the MS Azure cloud environment as well as Amazon Web Services, and has command of several programming languages including Python and R.



**WILL CARTER | LEAD SOFTWARE ENGINEER**

Will is an Agile software engineer with over 15 years of experience working with GIS, databases, various programming languages and web development platforms. His background includes working with geographic data processing, query optimization and automation to produce data driven visualization tools and web maps. Will is also a certified Amazon Web Services (AWS) practitioner.



**ALEX SCHELLHORN | PROJECT HYDROGEOLOGIST**

Alex is a project hydrogeologist based in Dallas, TX serving as the project liaison between LRE Water and all of our clients located within North Texas. Alex will serve as a local linkage between District and LRE Water project staff performing the technical work on the system. She has correlation and mapping experience in a multitude of states including Texas, Oklahoma, Mississippi, and Louisiana. Her academic background includes a Master's in Energy Business from The University of Tulsa, and a Bachelor of Science in Geology from Texas Christian University.



*I'm impressed with the research that LRE Water did to understand everything about CTWC, so they can give us strategic direction in resolving our issues. The quality of work is excellent - everything they have delivered has been top rate. The research that Jordan is doing is original a lot of times, and we use it to educate our river authorities and our Texas agencies."*

*—Jo Karr Tedder, President,  
Central Texas Water Coalition*

# DESCRIPTION OF PREVIOUS WORK

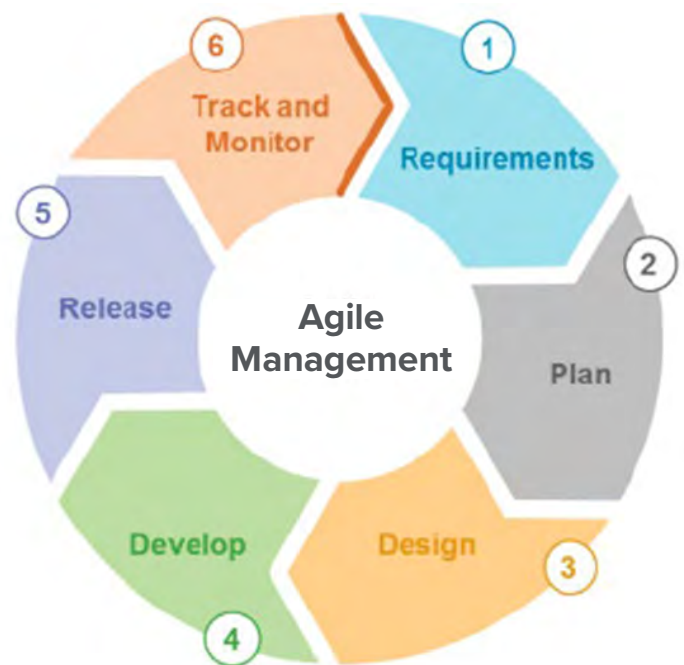
LRE Water has been building database applications for a wide variety of water management entities for over 15 years. These systems run the gamut of functionality, including interactive mapping tools, online data entry, custom querying and reporting, analytical tools and easy to understand data visualizations and analytics. These tools are being used by water managers, water accountants and field staff to monitor and manage data related to well information, meter readings, water levels, water quality, and more. Several of these systems also have public-facing components designed to engage stakeholders, provide management tools for irrigators and district members, and streamline reporting for regulatory compliance.

Our systems are built on a common foundation of **non-proprietary**, license-free software wherever possible, keeping ongoing costs manageable. This also means that you own your system once it's delivered, not LRE Water (we will of course host and support your system for you as long as you need). We also build on past work and leverage our experience so that new tools do not need to be created from scratch. We can readily adapt functionality shown in the examples below to meet your needs, allowing the Districts to focus resources on innovative solutions to challenges unique to your area and ensuring that your budget is spent on customizations important and necessary for you.

The following pages highlight several highly relevant examples of data management, analysis, and mapping systems LRE Water designed, developed, and continues to support. At the beginning of this section a table illustrates a comprehensive list of LRE Water developed tools and the various functions they serve related to client needs. **Note: hyperlinks will take you to the public-facing portion of each database application.**

## CLIENT-FOCUSED, AGILE MANAGEMENT

LRE Water is committed to meeting our client's expectations and delivering on time and on budget and we use leading-edge software development management techniques to ensure success. "Agile Management" means that our professionals spend time with Clients during each step of the development process, getting input early and often. It also means that high priority features identified during an in-depth Requirements Discovery Stage (preliminary meeting) are prioritized and finished first so they can be tested and even put to use while there is still plenty of time to make improvements. Agile Management ensures a high quality final product that meets expectations.



## SYSTEM PLATFORM, HOSTING AND DATA MANAGEMENT

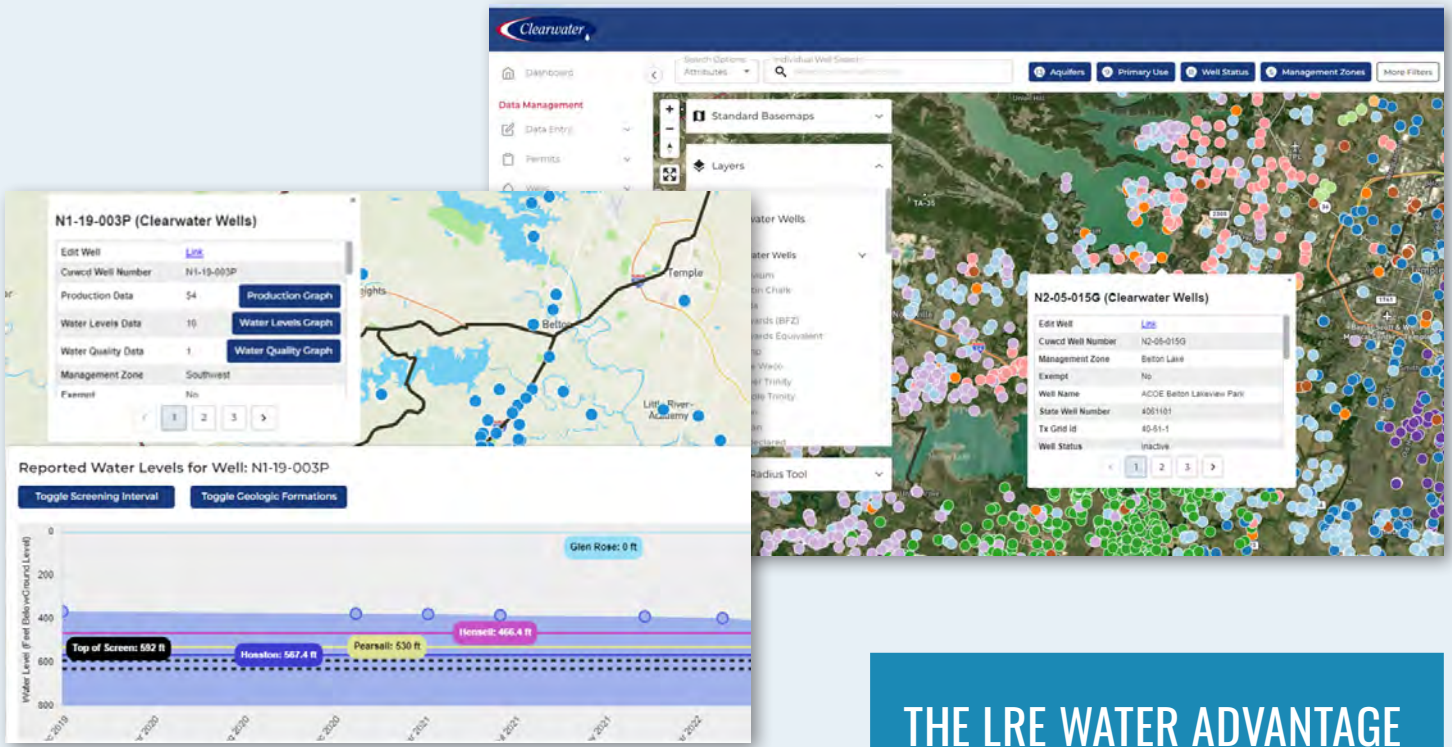
LRE Water will support your current Django/MS Azure/ PostgreSQL system and our staff have experience with the MS Azure cloud hosting environment, the Django web framework and the PostgreSQL database platform. As part of hosting and managing your system, we will review your current setup and ensure the system is being backed up appropriately as well.



# SUMMARY OF DASHBOARD AND DATA VISUALIZATION PROJECTS

Client and Project Name	Project Link	Client Type				Key Function											
		State Government	Local Government	Special District /Authority	Private Company	Interactive Mapping	Regulatory Workflow	Production Reporting	Multiple User Roles	Spatial Well Data	Data Management	Custom Queries	Modeling/Forecasting	Regulatory Reporting	Texas	Colorado	California
<b>Clearwater Underground Water Conservation District (CUWCD)</b>	<a href="https://clearwater.lre-up.com/map">https://clearwater.lre-up.com/map</a>		◆			◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		
<b>Barton Springs Edwards Aquifer Conservation District (BSEACD)</b>	<a href="https://bseacd.lre-up.com/map">https://bseacd.lre-up.com/map</a>		◆			◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		
<b>North Plains Groundwater Conservation District (NPGCD)</b>	<a href="https://northplainsgcd.lre-up.com/">https://northplainsgcd.lre-up.com/</a>		◆		◆	◆			◆	◆	◆	◆		◆			
<b>United and Water Sanitation District Dashboard</b>	<a href="https://unitedwaterdata.com/">https://unitedwaterdata.com/</a> User: CWC Demo Password: CWCD3m0			◆		◆		◆	◆	◆	◆		◆			◆	
<b>Cherry Creek Basin Water Quality Portal</b>	<a href="https://ccbwwqportal.org">https://ccbwwqportal.org</a>			◆		◆			◆	◆		◆				◆	
<b>Urban Waters Water Quality Assessment Tool (formerly South Platte WQAT)</b>	<a href="https://spwqat.lre-up.com/">https://spwqat.lre-up.com/</a>	◆	◆			◆			◆	◆						◆	
<b>Arkansas Basin Colors of Water Data Viewer</b>	<a href="http://div2waterops.com/ColorsOfWater">http://div2waterops.com/ColorsOfWater</a>	◆				◆			◆		◆					◆	
<b>Arkansas Basin Water Requests System</b>	<a href="http://div2waterops.com">http://div2waterops.com</a> User: CWC Demo Password: CWC#d3m0!	◆					◆		◆	◆		◆				◆	
<b>Siloam Well Users Meter Use Reporting &amp; Accounting Dashboard</b>	Not public - contact LRE Water for demo				◆	◆	◆	◆	◆	◆		◆	◆			◆	
<b>Central Colorado Water Conservancy District Data Management Dashboard</b>	Not public - contact LRE Water for demo			◆		◆	◆	◆	◆	◆	◆	◆	◆			◆	
<b>GSConfluence Data Management and Reporting Platform Concept</b>	<a href="https://gsconfluence.com/">https://gsconfluence.com/</a>		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆			◆	





CHECK OUT THE SYSTEM: <https://clearwater.lre-up.com/map>

## CLEARWATER UNDERGROUND WATER CONSERVATION DISTRICT

BELL COUNTY, TX

LRE Water refined and updated CUWCD's data management, analysis, and integrated mapping system for water well permitting processes and hydrologic data management. The database application has the following capabilities:

### Data Management:

- Maintains water level and water quality records and summarizes the data in customized reports.
- Creates a seamless permitting workflow process and generates applicable maps and reports.
- Automates online well registration and permittee reporting of water level and production data.
- Allows multiple user roles with different permissions and levels of system access.

### Public-facing Dashboard:

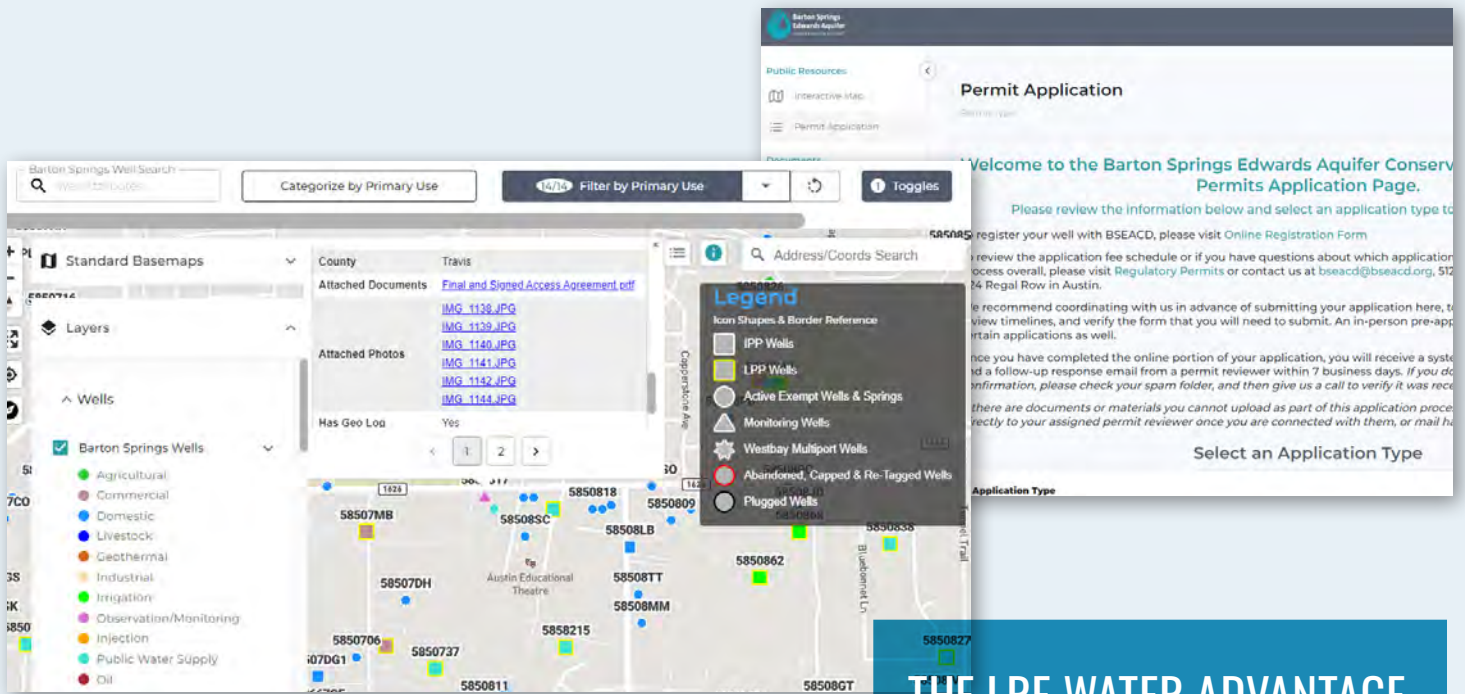
- Displays an interactive map with aquifer and surface geology layers, groundwater wells, land parcels, and GIS layers developed by District staff or consultants.
- Allows for spatial queries, exporting, and printing of maps.
- Extracts and displays stratigraphic columns based on GIS layers developed by District consultants.
- Extracts and displays well completion diagrams (casing, screen, intersected formations, etc.) based on available data for each well.

### Data Analysis and Visualization:

- Assessment of the status of each aquifer with respect to adopted desired future conditions (DFC).
- Dynamic visualization of water-level data and trends with user-friendly plot customization options.
- Dynamic visualization of water quality parameters with an option to view various water quality parameters at once.
- Spatial interpolation of water level measurements allowing for dynamic contouring of historic and present water levels.

The data management and integrated mapping system currently aids the District in providing educational materials to the public, in making and assessing groundwater permit applications, in determining compliance with established DFCs, and in managing data provided by District permittees.

**THE LRE WATER ADVANTAGE**  
 As hydrogeologists first, we understand the need for effective management of groundwater data to support management of the groundwater resources.



CHECK OUT THE SYSTEM: <https://bseacd.lre-up.com/map>

**THE LRE WATER ADVANTAGE**  
 LRE Water's system developers are not just computer scientists - we are an interdisciplinary team of professionals that understand the hydrogeological factors affecting your district.

## BARTON SPRINGS EDWARDS AQUIFER CONSERVATION DISTRICT DATA MANAGEMENT AND INTEGRATED MAPPING SYSTEM

TRAVIS AND HAYS COUNTIES, TX

LRE Water is working with Barton Springs Edwards Aquifer Conservation District (BSEACD) to replace an outdated system built on Microsoft Access. Their new system will include all the relied upon features of their old system but also provide them with new management and analysis tools, an integrated mapping system with a public facing version and internal version, and online tools supporting their permitting processes. Some unique highlights of BSEACD's new system include:

### Data Management, Analysis, and Visualization:

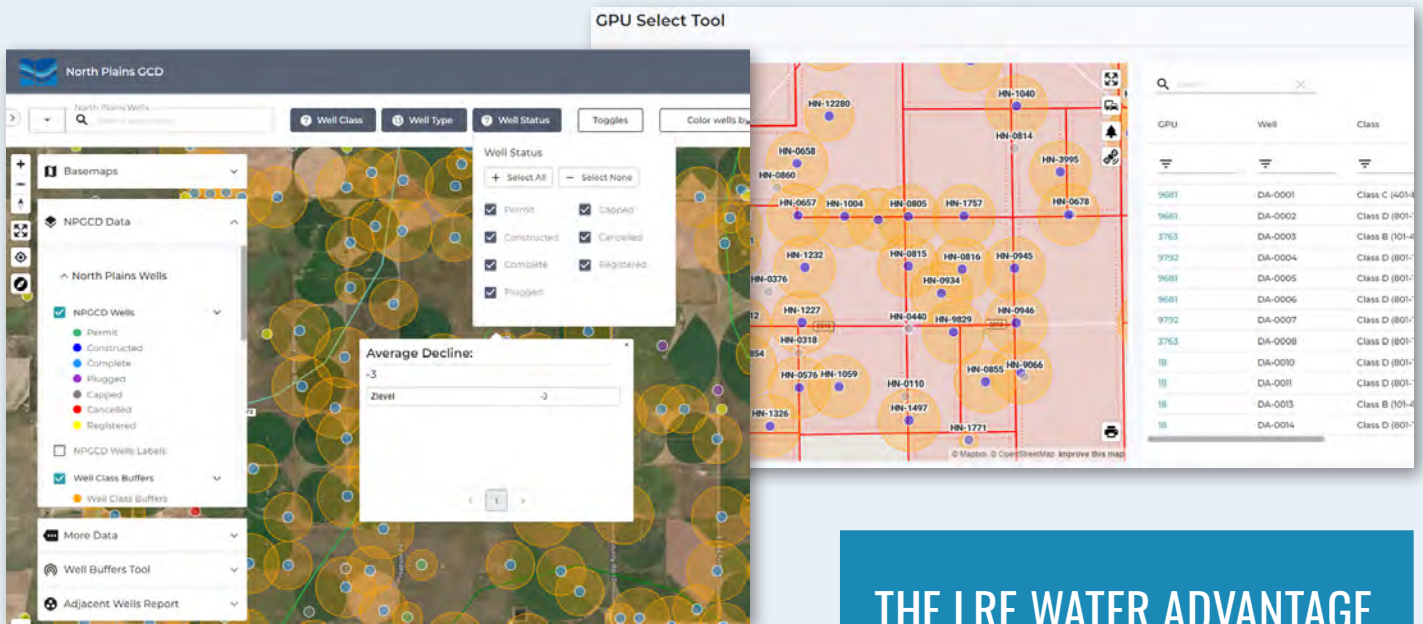
- Well owner access to meter readings, data entry for those readings, immediate pumping calculations based on entered readings, and graphical displays showing usage, allocations, and well hydrogeology features.
- Incorporation of water level and water quality data, including data entry tools for BSEACD staff and interactive visualizations.
- Tools supporting permitting workflow, administrative processes and generation of applicable maps and reports.
- Automation of well registration, permit setup and permitted pumping vs allocations.
- Multiple user roles with different permissions and levels of system access.

### Public-facing Dashboard:

- Public facing interactive map with aquifer and surface geology layers, groundwater wells, land parcels, and additional GIS layers developed by District staff and consultants.
- Functions that allow for spatial queries, exporting, and printing of maps.
- Transparent access to well information including attached documents.

This new data management and integrated mapping system will aids the District in providing educational materials to the public, in making and assessing groundwater permit applications, in determining compliance with established DFCs, and in managing data provided by District permittees.





CHECK OUT THE SYSTEM: <https://northplainsgcd.lre-up.com/>

## NORTH PLAINS GROUNDWATER CONSERVATION DISTRICT DATA MANAGEMENT AND INTEGRATED MAPPING SYSTEM

### TEXAS PANHANDLE

North Plains Groundwater Conservation District (NPGCD) engaged LRE Water to develop a public-facing map that can integrate with their well information management system which is supported by a separate vendor. LRE worked with NPGCD and their other consultants to create a richly featured interactive map displaying over 19,000 district managed wells and providing users of the map with a set of tools to explore existing well information and self-evaluate the potential for new well applications.

Most notably, the system connects every 2 hours with web services developed by their data management vendor and keeps the information behind the map current. Some unique highlights of NPGCD's interactive mapping system include:

- Access to historical and current water level observations from both annual winter well observation data sets and near-real-time telemetry.
- Water level data are displayed graphically with interactive tools for specifying date range and downloading the displays or the data behind the displays. Winter Observation water level graphs also include a trendline calculated from available data and extending 5 years into the future by extrapolation.
- Tools for mapping buffers around wells based on well classifications, to determine potential new well locations.
- Interactive searching and reporting tools based on NPGCD's Groundwater Production Units map layer, kept current with automated web services.
- Inclusion of map layers managed by TWDB, also kept current with automated web services.
- Incorporation of NPGCD-generated contour maps showing average water level declines, depth to water and saturated clay thickness over the 6-county area.
- Integration of county CAD Parcel layers and several other helpful but hard to access public data sets.
- A set of user help-guides providing use-case focused instructions on using the map to accomplish certain tasks and answer common questions.

This interactive public map system will be completed by October 2023 and will provide members of the District with transparent access to NPGCD managed well information as well functionality for understanding the current state of groundwater levels and existing well data, and the potential for new well development.

## THE LRE WATER ADVANTAGE

LRE does not believe in “one-size-fits-all” groundwater management systems. Instead we leverage a common platform “under the hood” to save development costs and then deliver cost effective, custom tools designed to perfectly fit your needs.

# REFERENCES

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## **DIRK AARON**

General Manager  
Clearwater Underground Water Conservation District, TX  
<https://clearwater.lre-up.com/map>  
[daaron@cuwcd.org](mailto:daaron@cuwcd.org)  
254-933-0120

## **TIMOTHY T. LOFTUS, Ph.D.**

General Manager  
Barton Springs Edwards Aquifer Conservation District, TX  
<https://bseacd.lre-up.com/map>  
[TLoftus@bseacd.org](mailto:TLoftus@bseacd.org)  
512-282-8441

## **ODELL WARD**

Aquifer Science Manager, GIT  
North Plains Groundwater Conservation District, TX  
<https://northplainsgcd.lre-up.com/>  
[oward@northplainsgcd.org](mailto:oward@northplainsgcd.org)  
719-339-4208

## **DREW DAMIANO**

Vice President of Operations  
United Water and Sanitation District, CO  
[drew@thebromleycompanies.com](mailto:drew@thebromleycompanies.com)  
303-659-5000

## **RUTHANNE SCHAFFER**

Water Resources Analyst  
City of Thornton, CO  
[ruthanne.schaffer@thorntonco.gov](mailto:ruthanne.schaffer@thorntonco.gov)  
720-977-6600

# CLIENTS UNDER NTGCD OR RRGCD JURISDICTION

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LRE Water currently is the design engineer of record for the Tanglewood on Texoma Well #23 project in Grayson County (for Texas Water Utilities), and the Fields Well No. 1 project in Denton County (for FHQ Holdings, Inc.). In addition, we are working on behalf of the Antero Group to develop Well #6 for the City of Bells, and will soon be submitting to RRGCD the associated permit application and hydrogeological report. We are also subcontracted to Hayter Engineering for work on a well owned by the City of Pottsboro, TX. We recently provided the Billingsly Company with a proposal to complete a hydrogeologic report in support of a permit application they intend to submit to the NTGCD for a well in Denton County. We believe we can provide Water Well Management System consulting services to the Districts without creating a conflict of interest with our clients who may submit permit applications to the Districts.

# SERVICES PROPOSED FOR THIS SOLICITATION

We understand that the Districts intend to enhance their existing well data management system and are in need of support to:

- Maintain and make general improvements to the existing system
- Develop a permitting module
- Improve water billing processes, and
- Create other features/enhancements requested by the Districts

As evidenced in our previous dashboard and management system projects in Texas and elsewhere, we can offer the Districts all requested services, and we develop customized applications to meet individual client needs. We also routinely build upon existing applications, to make improvements and add new, useful features. The goal of all of these efforts is to help in aquifer management, including in aquifer education, pumping mitigation programs, data reporting, and DFC monitoring/compliance.

Through preliminary conversations with staff from the Districts, we understand that the current system was created using the Django web framework and the Python programming language. We have researched this web framework and found it similar in syntax and functionality to many previously used in data management system projects. Notably, it shares similarities with Drupal, which LRE Water used as their standard development platform from 2007-2017. LRE Water continues to host and manage several systems based on these frameworks to this day. To verify our capabilities with Django, we constructed a simple data management system entirely in Django. As such, we believe we can maintain and enhance DripDrop in its current form, without having to migrate the system immediately to our standard platform.

Should the Districts wish to implement significant changes or new functionality, we recommend updating to LRE Water's standard technology platform which is more flexible for customizing to the Districts' specific needs, and has very low ongoing hosting and maintenance costs. Our standard platform also leverages PostgreSQL for data management so this migration would primarily just be an overhaul of the user interface. By migrating to LRE Water's standard platform, the Districts could also take advantage of tools and functions already developed for other LRE Water systems, such as Clearwater's, Barton Spring's, and North Plains.

We propose to tailor our offered services based upon conversations with the Districts during a project kickoff meeting. At this meeting, we will strive to listen to the Districts and learn exactly what features and methods are to be created/used during this project. We will also present to the Districts some of the tools we've developed for other clients, which we think would be of benefit to District staff and operations. From this discussion, we will jointly develop a project scope and budget, so that both the Districts and LRE have a clear understanding of expectations for this project work.

## COMPUTER REQUIREMENTS

When creating systems from scratch, LRE Water will leverage the Amazon Web Services cloud to securely host your database, Netlify to deploy and manage your web-facing system components, and Auth0 to integrate secure login controls. This "trifecta" of industry standard tools and services combined with LRE Water's experienced system management and support staff provides you with a stable and secure system that will have very minimal downtime and will stand the test of time. Nightly system backups are standard and we monitor this to ensure it's happening successfully.

When maintaining existing systems, we work with system owners to identify "pain points" and develop solutions with minimal effort and system changes, where possible. We are confident we can work within the confines of the Districts' existing system, utilizing Django to create minor system enhancements. We expect to discuss these pain-points with you during the initial project kickoff meeting, and to then discuss the feasibility of implementing solutions without a system migration to LRE Water's standard platform. We can also discuss with the Districts what a system migration would look like, and the advantages that may be gained by moving the current system to a modern, custom JavaScript framework.

All LRE Water systems are built on a common foundation of non-proprietary, license-free software wherever possible.



# **APPENDIX A**

KEY PERSONNEL RESUMES

# JORDAN FURNANS, PhD, PE, PG

Water Resources Engineer | Vice President - Texas Operations



Jordan leads LRE Water, LLC in Round Rock, Texas. His 22 years of professional experience encompasses both field hydrologic data collection and analysis of data through the development and application of numerical models. He specializes in water availability modeling (groundwater and surface water), groundwater management, well design, water rights analysis & acquisition, hydrology & hydraulics, water supply planning/evaluation, water valuation, water right accounting; optimization, coupled field and model hydrodynamic investigations of estuaries, lakes, and rivers; linking water quality and hydrodynamics in natural systems; watershed hydrology planning and management; flood plain management; hydrographic and sedimentation survey methods; and freshwater inflow and instream flow requirements for ecosystem health.

## EDUCATION

PhD, 2005, Civil Engineering  
The University of Texas at Austin

MSE, 2001, Environmental & Water Resources Engineering  
The University of Texas at Austin

BSE, 1999, Civil/Geological Engineering, Princeton University

US Fulbright Fellowship, 2002-2003, Centre for Water Research  
The University of Western Australia

## PROFESSIONAL REGISTRATION

### Professional Engineer

TX	(2006)	No. 97316
CO	(2010)	No. 44217
NM	(2010)	No. 19880
OK	(2012)	No. 26095
AZ	(2015)	No. 61061
KS	(2019)	No. 26856

### Professional Geoscientist

TX	(2011)	No. 11002
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### NSPS Certified Hydrographer\*\*

USA	(2011)	No. 268
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\*\*National Society of Professional Surveyors

## EMPLOYMENT & GENERAL EXPERIENCE

### LRE Water, LLC, Round Rock, TX

*Senior Project Manager, Vice President and Manager of the LRE Water, Inc. Texas office*

2015-present

Conducts and supervises water resource investigations, including State of Texas WAM modeling, water availability modeling, water rights permitting & analysis, watershed hydrology, surface water supply/analyses, groundwater availability assessments/modeling, groundwater well design/permitting, reservoir and river operations modeling, and hydrographic surveys of reservoir volumes and sedimentation.

### The University of Texas at Austin, Austin TX

*Adjunct Faculty – Department of Civil, Architectural, and Environmental Engineering*

2016-present

Teaching CE 356 – Fundamentals of Hydraulic Engineering

### INTERA, Inc. Austin, TX

*Senior Water Resources Engineer & Surface Water Team Manager*

2009-2015

### Texas Water Development Board. Austin, TX

*Water Resources Engineer*

2003-2009



## RECENT & RELEVANT PROJECT EXPERIENCE

### **State of Texas Estimate of Groundwater Pumping Volumes, Locations, and Aquifers for West Texas, TWDB (2020-2022)**

Project Manager/Engineer. Served as project manager for effort to revise and improve historical groundwater pumpage datasets for the Pecos Valley, Edwards-Trinity (Plateau), Lipan, Trinity (Hill Country), and Edwards (Balcones Fault Zone) aquifers. Revised datasets were based on the TWDB water use survey datasets, updated through improved and uniformly applied analysis techniques. Pumpage was quantified by year from 1984-2018 for each of 54 counties and 5 aquifers. We also developed an ArcGIS tool that translates the pumpage data into MODFLOW Wel files for use within the GAM program. TWDB Contract Number 2048302456.

### **State of Texas Estimate of Groundwater Recharge Volumes and Locations for West Texas, TWDB (2020-2022)**

Staff Engineer. As a subconsultant to WSP, Inc, led project efforts to assess historical recharge in west Texas using the Soil Water Balance (SWB) model, the USGS Groundwater Toolbox (RECESS & RORA), and a modified SCS Curve Number method. Developed the modified SCS Curve number method for assessing recharge as a rapid means of assessing recharge ranges using automatable, standard hydrologic analysis techniques without required calibration. Applied all methods to the Pecos Valley, Edwards-Trinity (Plateau), Trinity (Hill Country), and Edwards (Balcones Fault Zone) aquifers .TWDB Contract Number 2048302455.

### **Groundwater Development – Grayson County, TX, Texas Water Utilities (2021-Present)**

Project engineer responsible for conducting a groundwater availability study for the Tanglewood on Texoma subdivision serviced by the South West Water Corporation. Analyzed local geologic data and TWDB GAM models to recommend ideal well locations and development timelines to ensure community would have sufficient water through 2050. Included estimated well costs, yields, and expected water quality from each proposed well site.

### **Groundwater Development – Webb County, TX, SE Legacy WSC (2021-Present)**

Project engineer responsible for the design, permitting, and construction oversight of groundwater wells in Webb County to support local residential, commercial/industrial development along I-35 as well as to provide supplemental public water supplies for Webb County and the City of Laredo.

### **Camp OTX Groundwater Well Design & Permitting – Bandera, TX (2021-Present)**

Project Manager/Engineer. Developed groundwater well permit applications to the Bandera County River Authority and Conservation District, application to TCEQ for a new public supply groundwater well, and well design specifications for groundwater wells to support camp operations. Permits pending approval in January 2022, with drilling/construction to commence shortly thereafter.

### **Evaluation Rainfall-Runoff Trends in the Upper Colorado River Basin, Phase II – TWDB, (2018-2019)**

Project Manager/Engineer. Investigated the cause of diminished rainfall/runoff response in the Upper Colorado River Basin, and to quantify the reduction in streamflow resulting from determined causes. This investigation involved quantifying the impact of small detention structures of runoff-based streamflow, assessing the impact of continued groundwater production on springs and baseflow, correlating trends in precipitation, temperature, and soil moisture to streamflow production, and compiling statistical analyses to suggest streamflow impacts and potential mitigation measures. TWDB Contract Number 1800012283.

# KELLY CLOSE, PE

Senior Technical Advisor | Water Rights Engineer | Technology Team Lead



Kelly leverages modern technologies to meet water planning and management challenges. Her passion is finding better ways to turn data into information, streamline data-driven reporting and modeling, and support efficient day to day water operations. Her background includes water rights engineering and accounting, surface and ground water modeling, rainfall runoff predictive modeling, water quality analysis, field data collection and environmental permitting. Kelly leads LRE's Water Information Technology (WIT) team, an interdisciplinary group of water experts with a knack for the high tech, collaborating with clients to deliver intelligent and long lasting data management and analytical solutions to water management challenges.

## FEATURED PROGRAM & PROJECT EXPERIENCE

### EDUCATION

B.S., Environmental Design,  
University of Colorado 1992,  
additional Coursework in  
mathematics, 2003 - 2007

### PROFESSIONAL REGISTRATION

Professional Engineer  
CO#44870

### PROFESSIONAL ACTIVITIES

American Water Resources  
Association (AWRA)  
2021

Shannon Estates Water and  
Sanitation District (SWSD) –  
Current Board Vice President  
2017

Colorado Lake and Reservoir  
Management Association  
(CLRMA) – President  
2016 - Present

Crystal Lakes, Colorado Water and  
Sewer District Board (CLWSD)  
Colorado Foundation for Water  
Education 2009 Water Leaders

#### Clearwater Underground Water Conservation District

#### (CUWCD) Data Management System & Integrated Map, Texas

Kelly led the development of CUWCD's system for management of wells, permits, and well monitoring data (water quality, pumping and water levels). The system includes a public facing web map with dozens of GIS layers that help users find their own wells and explore hydrogeological conditions for existing and potential wells. CUWCD staff also use the system to monitor drought conditions, send drought notices, and to report out to their Board. Well owners can log in to provide report well production data and track usage against annual allocations.

#### Barton Springs Edwards Aquifer Conservation District

#### (BSEACD) Data Management System & Integrated Map, Texas

Kelly is leading the development of a new platform BSEACD will use for management of wells, permits, and well monitoring data. The system will include a public facing map with dozens of GIS layers that users can use to find their own wells and explore hydrogeological conditions for existing and potential wells. LRE is porting BSEACD's existing data from an MS Access based system which they are outgrowing, and the new system will include all of the old data, and provide much-needed new functionality and security. Well owners will be able to log in to provide self-reported meter readings and track usage against annual allocations. Michael will support this tool as part of LRE Water's annual hosting and support services.

### **North Plains Groundwater Conservation District (NPGCD) Interactive Water Well Map, Texas**

Kelly led the development of an interactive web map which brings together interactive public facing web mapping tools with NPGCD's existing well management system. This public facing tool will empower users to find their own wells, explore conditions for existing and potential wells, measure distances and buffer points, locate Texas state well logs, view graphs of NPGCD managed well observation data and more. Michael will support this tool as part of LRE Water's annual hosting and support services.

### **United Water and Sanitation District Water Operations Dashboard**

United Water is LRE's longest standing client for data management and visualization services. Kelly led the original design and build on this system and continues to lead its ongoing support and updates. It is a cloud based data collection and management system leveraging an open source platform and it automates data collection for hundreds of private and public telemetered monitoring stations on structures along the Front Range. Data telemetry data are captured and stored in a cloud database which processes the data and serves it up to a series of customized data visualization tools on the web. The Dashboard includes easy to comprehend interactive graphics, conveys real-time and historical data and long-term trends.

### **Central Colorado Water Conservancy District (CCWCD), Colorado**

Kelly leads development, hosting and support for database and web tools that automate accounting, capture telemetry data and water quality data, and provide visualization, analytics and online reporting, to help CCWCD staff manage over 1300 wells, recharge ponds, irrigation reservoirs, and flow stations. The non-proprietary system is highly customizable and adaptable to CCWCD's ever-changing needs.

### **Flying B-Bar "B20" Water Tracking Dashboard**

Kelly led the design and deployment of a mobile-friendly tool for managers to track key groundwater system metrics. The tool employs animated graphics and delivers real-time pumping and delivery data to operators, decision makers, and Flying B clients. A sophisticated database supports alerts and individualized content while a hierarchical interface delivers high-level summaries as well as detailed views of the raw telemetry data.

### **Cherry Creek Basin Water Quality Authority (CCBWQA), Colorado**

Kelly led the development of a comprehensive water quality database and website for CCBWQA that helps them meet regulatory compliance, stakeholder outreach, modeling and reporting needs. For the past 3 years, CCBWQA has used the system to publish an online and interactive Annual report. The system includes secure login roles for data upload, download and editing while allowing all users to access visualizations and analysis tools. <https://ccbwqportal.org>

### **Mile High Flood District (MHFD) Alert Maps, Colorado**

Kelly manages ongoing work with the MHFD supporting flood managers and public users with online access to flood alerts and climate and hydrology data in the Denver Metro area. Web sites incorporate map based graphical displays and data behind the sites are managed in a cloud-based database. From May – October each year LRE and her team monitor a real-time rainfall runoff modeling system they developed for MHFD in 2010, which runs every 5 minutes and reports data to a web-based model output viewing tool.

# WALLACE DARLING, III, GIT

Staff Hydrogeologist



Wallace Darling III (“Wally”) is a Staff Hydrogeologist with one year of experience in groundwater and surface water hydrology and environmental remediation. His technical expertise subject areas include well field design, numerical data processing and visualization, field data collection and interpretation, and environmental remediation. Wally provides technical oversight and assists in the collection, interpretation, and analysis of geologic and hydrologic data for use in hydrogeologic evaluations.

## FEATURED PROGRAM & PROJECT EXPERIENCE

### Legacy SE Well Field Development – Webb County, Texas (2023)

Primarily focused on field work and construction oversight on future public water supply wells. Collection and classification of drill cuttings for accurate well lithology. Oversight of borehole logging, including the use of NMR technology. Closely monitored well development process and conduct regular sampling to ensure quality and identify any potential issues.

### Arbuckle Reservoir – Wharton, Texas (2023)

Utilizing Excel, Mr. Darling expanded an existing dataset encompassing total flows from the Colorado River, alongside the water rights usage of multiple entities. The primary objective was to ascertain the feasible quantity of water that could be diverted from the river into Arbuckle Reservoir while ensuring compliance with existing water use permits.

### Texas Water Development Board Database – Texas (2023)

In support of multiple projects, Mr. Darling has compiled the well completion data available from the TWDB by using Python to manage and query large datasets that can be shared between projects.

## EDUCATION

M.S. Hydrology, Tulane University, 2022

B.S. Geology, University of South Florida, 2018

## PROFESSIONAL REGISTRATION

Geologist-in-Training  
TX #625

## RELEVANT EXPERTISE

Data Management & Processing  
Python Programming  
Preparation of Technical Reports

### Brazoria Wellfield Assessment – Brazoria County, Texas (2023)

Creating topographic rasters using ArcGIS based on datapoints of aquifer attributes such as water levels, total dissolved solids, and other water quality variables.

### Spatial and Temporal Analysis of Surface Water in Jean Lafitte National Park – New Orleans, Louisiana (2020-2022)

During a partnership with the National Park Service Mr. Darling was tasked with evaluating the change in surface hydrology for a specific area within Jean Lafitte National Park. The goal of the project is to better understand the impacts of both man-made and natural causes that can alter the surround hydrology. Southern Louisiana is prone to intense tropical storms as well as rapid land subsidence and rising sea-levels. Mr. Darling assisted in the completion of a well field consisting of 28 shallow monitoring wells that capture water level both below and above the ground surface along with three subsidence markers. The data collected was then analyzed to look for trends and relationships between different variables including seasonal patterns, rainfall intensity and duration, death of



vegetation and frequencies of flooding based on the changing lithology. Utilizing multiple resources such as NOAA, USGS, and The Army Corps of Engineers Wally compiled data into a single format that can be used for future evaluations of the landscape. Additionally, interactive data visualizations were created and made available to park staff to help answer any additional questions. The project is ongoing and has assisted both local park staff and regional staff with resource management as well as financial management questions while providing strong scientific reasoning for the answers. (While enrolled at the Tulane University)

### **Spatial and Temporal Analysis of Surface Water in Jean Lafitte National Park – New Orleans, Louisiana (2020-2022)**

During a partnership with the National Park Service Mr. Darling was tasked with evaluating the change in surface hydrology for a specific area within Jean Lafitte National Park. The goal of the project is to better understand the impacts of both man-made and natural causes that can alter the surround hydrology. Southern Louisiana is prone to intense tropical storms as well as rapid land subsidence and rising sea-levels. Mr. Darling assisted in the completion of a well field consisting of 28 shallow monitoring wells that capture water level both below and above the ground surface along with three subsidence markers. The data collected was then analyzed to look for trends and relationships between different variables including seasonal patterns, rainfall intensity and duration, death of vegetation and frequencies of flooding based on the changing lithology. Utilizing multiple resources such as NOAA, USGS, and The Army Corps of Engineers Wally compiled data into a single format that can be used for future evaluations of the landscape. Additionally, interactive data visualizations were created and made available to park staff to help answer any additional questions. The project is ongoing and has assisted both local park staff and regional staff with resource management as well as financial management questions while providing strong scientific reasoning for the answers. (While enrolled at the Tulane University)

### **Marianna Dewatering Project – Marianna, Florida (2019)**

Assisted in the design and implementation of a localized dewatering project to remove a leaking underground storage container and prevent contamination into the surficial aquifer. Mr. Darling provided construction oversight and handled contractors for multiple jobs taking place simultaneously with guidance from senior engineers. (While employed at ECS FL)

### **Arsenic Contamination Evaluation – Jacksonville, Florida (2019)**

Aided in the design and placement of 36 shallow monitoring wells and 3 deep pumping wells to be situated along property near the Saint Johns River to monitor an ongoing arsenic contamination. Professional services included analyzing well field design, water sampling, monthly water level measurements for shallow wells, flow tests and wastewater disposal of deep pumping wells, water quality data for the existing wells and capture zone modeling to optimize pumping. Subsequent tasks included recommendations on future wellfield monitoring and maintenance and determining the suitability of pumping equipment for the existing wells. (While employed at ECS FL)

### **Environmental Risk Assessments – Multiple Locations, Florida (2018-2019)**

Conducted site evaluations and surface water and soil samples for multiple locations throughout Florida related to petroleum contamination due to leaking underground and above ground storage tanks. Mr. Darling documented damages and recommended remediation strategies for the affected areas, including the design of monitoring well systems to determine the extent of possible groundwater contaminations. Remediation plans consisted of both passive and active strategies where different techniques of remediation were applied based on the area's specific conditions. (While employed at ECS FL)

# MICHAEL BARRY

Staff Full-Stack Web-Developer



Michael Barry is LRE's lead full-stack web developer with a background of more than ten years of operations management. He creates data-driven graphical user interfaces to empower water resources decision makers. This includes water engineering projects, interactive maps, dynamic graphs & charts, and data management tools. Michael collaborates with several teams to deliver a clean project to the client.

## FEATURED PROGRAM & PROJECT EXPERIENCE

### Clearwater Underground Water Conservation District (CUWCD) Data Management System & Integrated Map, TX

Michael is the lead web programmer for CUWCD's system for managing wells, permits, and well monitoring data. The system includes a public facing web map with dozens of GIS layers that help users find their own wells and explore hydrogeological conditions for existing and potential wells. CUWCD staff also use the system to monitor drought conditions, send drought notices, and to report out to their Board. Well owners can log in to provide report well production data and track usage against annual allocations. Michael continues to support this tool as part of LRE Water's hosting and support services,

### Barton Springs Edwards Aquifer Conservation District (BSEACD) Data Management System & Integrated Map, TX

Michael is the lead web programmer for the platform BSEACD will use for management of wells, permits, and well monitoring data. The system will be complete by late fall 2023 and will include a public facing map with dozens of GIS layers that users can use to find their own wells and explore hydrogeological conditions for existing and potential wells. LRE is porting BSEACD's existing data from an MS Access based system which they are outgrowing, and the new system will include all of the old data, and provide much-needed new functionality and security. Well owners will be able to log in to provide self-reported meter readings and track usage against annual allocations. Michael will support this tool as part of LRE Water's annual hosting and support services.

### North Plains Groundwater Conservation District (NPGCD) Interactive Water Well Map, TX

Michael is the lead web programmer for an interactive web map which brings together interactive web maps with data from NPGCD's well management system. This public facing tool empowers users to find their own wells, explore conditions for existing and potential wells, measure distances and buffer points, locate Texas state well logs, view graphs of NPGCD managed

## EDUCATION

BA, Business, SUNY Oneonta, NY  
2009

## EXPERIENCE

2021–Present  
LRE Water – Denver, CO

## TECHNICAL SKILLS

JavaScript, ReactJS, HTML, CSS, PostgreSQL, Mapbox, NextJS, ChartsJS, Node.js, Material-UI, Auth0, mobile design.

## VALUE TO PROJECT

- Development of creative and flexible user graphical interfaces
- Data visualization, maps, decision support tools
- Solutions driven problem solver

well observation data and more. Michael will support this tool as part of LRE Water's annual hosting and support services.

### **United Water and San. District Water Operations Dashboard**

United Water is LRE's longest standing client for data management and visualization services. Their system covers thousands of square miles and includes monitoring, visualization and reporting functionality for streamflow data, reservoir data, recharge systems and well fields, and groundwater pumping and water levels data. Michael supports all web-facing aspects of this system, which allows the client and many of their consultants and engineers to interact with near real-time data collected for hundreds of private and public monitoring stations within Colorado's South Platte Basin.

### **Central Colorado Water Conservancy District (CCWCD), Colorado**

Michael leads the web development support and programming for CCWCD's extensive set of data management, visualization, data entry and reporting tools. Michael works closely with LRE's WIT team to help deliver hosting & support for these database & web tools that automate accounting and modeling processes, capture telemetry data and water quality data, and provide visualization, analytics, & online reporting, and enable CCWCD staff to manage over 1300 wells, recharge ponds, irrigation reservoirs, and flow stations. The non-proprietary system is highly customizable and adaptable to CCWCD's ever-changing needs.

### **Donala Water and Sanitation District Well Sustainability Dashboard**

Michael is working with the LRE Groundwater team and WIT database experts to develop the front end UI for a web based, interactive tool that provides visualization and analytics for well water monitoring data (water levels, pumping volumes and rates, and other pump health metrics) dating back decades. The District will use this tool to evaluate aquifer health and the sustainability of their aquifers as well as individual well health.

### **LRE Water Unified Platform, Web Tool Development**

Michael co-developed an open-sourced web application that is tailor-made for water engineering projects. It encapsulates a fantastic starting point for entering & analyzing data, accessing & visualizing wells & properties, and viewing reports & analytics. Using this design, he has created projects for 20 clients including Central Colorado Water Conservancy District, Clearwater Underground Water Conversation District, the town of Telluride, the town of Pipestone, Idaho Surface Water Coalition, and Cherry Creek Basin Water Quality Authority.

### **Cherry Creek Basin Water Quality Authority Web Portal**

Michael manages the web development of the CCBWQA Water Quality Data Portal and associated web-based interactive Annual Report of activities for the Colorado Water Quality Control Commission that enable users to access data efficiently, comprehend & integrate information and transform data into actionable insights

### **Eagle County Watershed Portal**

Michael expanded this platform where staff and stakeholders can access and analyze baseline watershed information via an online interactive portal that calculates statistics, enables targeted evaluations based on flexible queries, and translates results to potential risks. He has created several new data visualizations, mapping interfaces, and other analytics.

# TIM SALAZAR

Staff Full-Stack Data Scientist



Tim Salazar is a full stack data scientist experienced in data engineering, programming, and statistical methods, with a background in Geography, Ecology, Hydrology and Water Resources. Tim supports LRE Water's cloud systems development and security management, provides database programming and automation support, and adds to LRE's expertise in the programming analytical methods into custom tools. He has experience developing in the MS Azure cloud environment as well as Amazon Web Services, and has command of several programming languages including Python and R.

## FEATURED PROGRAM & PROJECT EXPERIENCE

### EDUCATION

BA, Geography, Minor in Ecology and Evolutionary Biology, University of Colorado, Boulder 2015

### EXPERIENCE

May 2023–Present  
LRE Water – Denver, CO

### TECHNICAL SKILLS

Python, R, NumPy, SciPy, Pandas, Matplotlib, SQL, Linux, Cloud Systems (Amazon and Azure), Docker, Kubernetes, Data Lakes, Machine Learning, Image Recognition, Statistical Methods

### VALUE TO PROJECT

- Programming for data processing and automation with the ability to pull from an extensive set of tools
- Solutions driven problem solver

#### **Clearwater Underground Water Conservation District (CUWCD) Data Management System & Integrated Map, TX**

Tim supports the R-Shiny based Analytical Tools programming that CUWCD staff rely on to track groundwater pumping impacts and water quality changes across the district. This tool incorporates model rasters, well pumping data, water quality monitoring results and spatial data layers to provide an interactive environment for exploring the data at a high level as well as drill down to specific details and locations.

#### **Barton Springs Edwards Aquifer Conservation District (BSEACD) Data Management System & Integrated Map, TX**

Tim provides SQL programming and cloud system architecture and security monitoring for this platform that BSEACD will use for management of wells, permits, and well monitoring data. The system will be complete by early 2024 and includes a public facing map with dozens of GIS layers that users can use to find their own wells and explore hydrogeological conditions for existing and potential wells. LRE is porting BSEACD's existing data from an MS Access based system which they are outgrowing, and the new system will include all of the old data, and provide much-needed new functionality and security.

#### **North Plains Groundwater Conservation District (NPGCD) Interactive Water Well Map, TX**

Tim maintains cloud system security, backups and system monitoring for this interactive web map which brings together interactive web maps with data from NPGCD's well management system. This public facing tool empowers users to find their own wells, explore conditions for existing and potential wells, measure distances and buffer points, locate Texas state well logs, view graphs of NPGCD managed well observation data and more.



### **United Water and San. District Water Operations Dashboard**

United Water is LRE's longest standing client for data management and visualization services. Their system covers thousands of square miles and includes monitoring, visualization and reporting functionality for streamflow data, reservoir data, recharge systems and well fields, and groundwater pumping and water levels data. Tim is working on an upgrade to this system that will significantly speed up the data collection process, providing United with the very near-real-time access it needs to their internally managed data, and also incorporate a more comprehensive set of public data, providing context for system monitoring. This new web-based system will allow United and their many consultants and engineers to interact with data collected for hundreds of private and public monitoring stations within Colorado's South Platte Basin.

### **Basalt Water Conservation District (BWCD) Online Well Meter Readings Reporting**

Tim is leading the development of a set of individualized online reporting forms for the 700+ members of the BWCD to allow them to report their well use monthly using web forms, instead of the paper forms that have been used historically. The shift to this online platform will save hundreds of hours of manual key entry, improving the accuracy of the data as well. The state regulatory agency, (Division of Water Resources) will be able to access reports that BWCD is required to send automatically, also reducing labor and improving BWCD's compliance.

### **Denver Water Climate Tools**

Tim provides scripting, automation and SQL programming support for the development of a set of web-based interactive tools that will allow Denver Water staff to track flows and water and air temperatures at key locations in their watershed, and look for relationships between these metrics and other water quality parameters also monitored and managed within the same system.

# WILL CARTER

Agile Software Engineer



Will Carter is an Agile software engineer with over 15 years of experience working with GIS, databases, various programming languages and web development platforms. His background includes working with geographic data processing, query optimization and automation to produce data driven visualization tools and web maps. Will is also a certified Amazon Web Services (AWS) practitioner.

## FEATURED PROGRAM & PROJECT EXPERIENCE

### Clearwater Underground Water Conservation District (CUWCD) Data Management System & Integrated Map, TX

Will provides geospatial processing and PostGIS SQL programming support for Clearwater's web-based well data management platform. The system integrates spatial and tabular data from a variety of sources, including user entered production data and CUCWCD staff entered water quality and water level monitoring data, staff managed well registrations, and raster and vector GIS data from many sources. On-the-fly processing ensures these data are aligned and available through a map-driven interface for review, analysis and the production of reports.

### Barton Springs Edwards Aquifer Conservation District (BSEACD) Data Management System & Integrated Map, TX

Will supports the SQL programming team, bringing his expertise in spatial analytics and PostGIS programming to add significant functionality to the well and permit data management platform LRE is building for BSEACD. BSEACD will use this system to manage wells, permits, and various types of monitoring data, and provide a public facing map with dozens of GIS layers that users can use to find their own wells and explore hydrogeological conditions for existing and potential wells.

### United Water and San. District Water Operations Dashboard

United Water is LRE's longest standing client for data management and visualization services. Their system covers thousands of square miles and includes monitoring, visualization and reporting functionality for streamflow data, reservoir data, recharge systems and well fields, and groundwater pumping and water levels data. Will is leading an effort to upgrade to this system to a more modern and secure web and database platform. The new system will providing United with very near-real-time access to their internally managed data, and incorporate a comprehensive set of public data, providing context for system monitoring

## EDUCATION

BA, Business Administration,  
University of Illinois at  
Urbana/Champaign  
1995

GIS Certificate, Front Range  
Community College, CO  
2017

Full Stack Software Developer  
Bootcamp, Flatiron School  
2020

## EXPERIENCE

October 2023–Present  
LRE Water – Denver, CO

## TECHNICAL SKILLS

ESRI ArcGIS, QGIS, PostgreSQL and  
PostGIS, Python, React, JavaScript,  
Ruby, C#, GDAL/OGRASP.NET,  
Docker, Kibana Data Viz

## VALUE TO PROJECT

Leadership for development and  
programming team; deep spatial  
data programming expertise.

# Alex Schellhorn

Project Hydrogeologist



Alex is a Dallas-based geologist with over 9 years of petroleum experience. She specializes in private equity-funded E&P horizontal operations, prospect generation for conventional activities, behind-pipe potential evaluation in vertical wellbores, and tertiary CO2 flood development and design. She has correlation and mapping experience in a multitude of states including Texas, Oklahoma, Mississippi, and Louisiana. Her academic background includes a Master's in Energy Business from The University of Tulsa, and a Bachelor of Science in Geology from Texas Christian University.

## FEATURED PROGRAM & PROJECT EXPERIENCE

### Contract Petroleum Geologist – Denbury Inc.

While at Denbury Inc. (May 2022 - April 2023), Alex played a pivotal role in a ground-up CO2 development project, effectively utilizing geologic, geophysical, and engineering data. She adeptly identified, assembled, and presented behind-pipe gas prospects in South Texas and provided essential support to engineers managing approximately 400 wells across four Mississippi fields. She was responsible for planning a designing a tertiary CO2 flood to target left behind oil in a historic field.

### Contract Petroleum Geologist – ClearRock Geophysics

During her tenure at ClearRock Geophysics, LLC (Jan 2020 - May 2022), Alex leveraged her expertise to design, gather, and interpret technical data, ultimately securing funding for 3D seismic data acquisition in Northern Louisiana. She excelled in generating prospects based on well and production data, employing calculations for channel volumetrics and constructing structure and isopach maps to enhance the identification of potential pay zones.

### Petroleum Geologist – Rimrock Resource Operating, LLC

At Rimrock Resource Operating, LLC (Aug 2014 - Nov 2019), Alex showcased her extensive experience in the full cycle SCOOP play, from prospect to production, particularly in horizontal Sycamore and Woodford wells. She contributed to well preparation, operations, and evaluation of both operated and non-operated well proposals. Additionally, her role as an expert witness at the Oklahoma Corporation Commission highlighted her ability to provide geologic testimony and technical exhibits in various hearings, including Spacings, Location Exceptions, Multiunits, and Poolings, solidifying her multifaceted expertise in the field.

## EDUCATION

B.S. Geology: Texas Christian University (2013)

Masters of Energy Business: University of Tulsa (2020)

## PROFESSIONAL CERTIFICATIONS

Preparing to take PG exam  
Spring 2024

## EXPERIENCE

Nov 2023 - present: LRE Water

May 2023 – Nov 2023: Independent  
Prospecting Geologist

May 2022 - April 2023: Contract  
Petroleum Geologist, Denbury Inc.

Jan 2020 - May 2022: Contract  
Petroleum Geologist, ClearRock  
Geophysics

Oct 2014 - Nov 2019: Petroleum  
Geologist, Rimrock Resource Op.



CONNECTING WATER TO LIFE



ATTACHMENT 11 a.

**RED RIVER GROUNDWATER CONSERVATION DISTRICT**  
**Well Registration Summary**  
 (as of 12/31/2023)

Well Type	Fannin	Grayson	Total RRGCD	New Registrations December 2023
Domestic	260	442	702	1
Public Water	61	196	257	0
Livestock	17	32	49	0
Agriculture	24	27	51	0
Commercial	10	19	29	0
Surface Impoundments	14	18	32	0
Oil / Gas	0	17	17	0
Golf Course	0	14	14	0
Irrigation	1	13	14	0
Monitoring	1	10	11	0
Industrial	0	7	7	0
*Other	1	0	1	0
<b>TOTALS</b>	<b>389</b>	<b>795</b>	<b>1184</b>	<b>1</b>

**NOTE: Plugged wells have been excluded**  
**\*Construction Water**

**RED RIVER GROUNDWATER CONSERVATION DISTRICT**  
**Well Registration Summary**  
(as of 1/31/2024)

Well Type	Fannin	Grayson	Total RRGCD	New Registrations January 2024
Domestic	260	442	702	1
Public Water	61	197	258	1
Livestock	17	32	49	0
Agriculture	24	27	51	0
Commercial	10	19	29	0
Surface Impoundments	14	18	32	0
Oil / Gas	0	17	17	0
Golf Course	0	14	14	0
Irrigation	1	13	14	0
Monitoring	1	10	11	0
Industrial	0	7	7	0
*Other	1	0	1	0
<b>TOTALS</b>	<b>389</b>	<b>796</b>	<b>1185</b>	<b>2</b>

**NOTE: Plugged wells have been excluded**  
**\*Construction Water**



ADJOURN