Attachment 3

Underground Injection Control Class VI Draft Permit ID Nos:
R6-TX-245-C6-0001
R6-TX-245-C6-0002
R6-TX-245-C6-0003

Preliminary Permit Review

D. Lauren Ross

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Prepared for
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August 4, 2025

Contents

List of Exhibits

Introduction and Summary of Opinions

This report evaluates information regarding groundwater in the vicinity of wells that would be permitted by the U.S. Environmental Protection Agency Region 6 Underground Injection Control Class VI Draft Permit ID Nos: R6-TX-245-C6-0001, R6-TX-245-C6-0002, and R6-TX-245-C6-0003. The permit would authorize ExxonMobil Low Carbon Solutions Onshore Storage LLC to inject supercritical fluids, including carbon dioxide, through three wells into the Fleming Formation at a depth of about 3,524 to 6,149 feet below mean sea level and into the Frio Formation at a depth of about 6,563 to 7,806 feet below mean sea level. The wells would be located in Jefferson County, Texas. [1]

The federal Underground Injection Control Program is promulgated under Part C of the Safe Drinking Water Act. 40 CFR Chapter I Subchapter D, §144.1(g)[2] provides that no injection shall be authorized by permit or rule if it results in the movement of fluid containing any contaminant into underground sources of drinking water. 40 CFR Chapter I Subchapter D, §144.3[3] defines underground sources of drinking water to encompass an aquifer or its portion that contains fewer than 10,000 mg/L total dissolved solids that is not an exempted aquifer. No information in the draft permit characterizes the proposed injection zone as an exempt aquifer.

Conclusions

Based on my review of available data, I have reached two conclusions:

- The proposed injection zones would encompass geologic strata that have been identified by the U.S. Geological Survey and the Texas Water Development Board as the Jasper Aquifer.

[1] Draft Permit, page 3.
[2] https://www.ecfr.gov/current/title-40/chapter-I/subchapter-D/part-144, accessed on July 31, 2025.
[3] https://www.ecfr.gov/current/title-40/chapter-I/subchapter-D/part-144/subpart-A/section-144.3,. Accessed on July 31, 2025.

- The permit application and proposed permit fails to demonstrate total dissolved solids concentrations in the proposed Jasper Aquifer injection zone higher than the 10,000 mg/L. The permit application and proposed permit fail, therefore, to demonstrate that the proposed injection wells would be exempt from the prohibition on injection into an underground source of drinking water.

In reaching these conclusions, I have relied on sound and reliable science and engineering of groundwater, including information in the documents identified in Attachment 1, and on my professional experience.

Qualifications

I have a Bachelor of Science degree in civil engineering from the University of Texas, awarded with highest honors, a Master of Science degree in civil engineering from Colorado State University, and a Doctor of Philosophy degree in civil engineering from the University of Texas. My master's degree research was water and solute movement into and through unsaturated soils. My doctoral research was multivariate statistical methods for analyzing environmental monitoring data.

I have worked as a civil and environmental engineer since 1977 and have been registered to practice engineering in Texas since 1984. My areas of expertise include water resources engineering, water quality protection and engineering design, groundwater fate and transport, stormwater management, erosion and sedimentation controls, solid waste and wastewater management and disposal, statistical methods, and environmental monitoring. I have served as a testifying expert in legal proceedings regarding these matters. Attachment 2 to this report is my resume.

Hydrogeologic Setting

ExxonMobil is seeking authorization to construct and operate three wells in Jefferson County, Texas to inject supercritical fluids, predominantly carbon dioxide, into subsurface formations. The location of these wells is depicted on Attachment 3. Injection Well Map.

Regulations in 40 CFR §146.84 requires the owner or operator of a Class VI well to delineate an area of review for a proposed geologic sequestration project based on computational modeling. Attachment 3. Injection Well Map also illustrates the area of review delineated by ExxonMobil in the permit application.

Hydrogeologic information in the vicinity of the proposed injection is available from Texas Department of Water Resources Report 236 published in July 1979.[4] Additional relevant information regarding the geologic setting of the proposed injection wells is available from the Texas Water Development Board Brackish Resources Aquifer Characterization System (BRACS).

Attachment 4 is a copy of Report 236: Stratigraphic and Hydrogeologic Framework of Part of the Coastal Plain of Texas, the results of a joint study by the U.S. Geological Survey and the Texas Department of Water Resources. Figure 1 of this report is an index map of 11 dip sections and 1 strike section that extend from near the Sabine River to the Rio Grande and to a depth of 7,600 feet below sea level. Each dip section is about 100 miles long.

Stratigraphy was delineated on each section based on nearby geophysical well logs of spontaneous potential and resistivity. The extent of sands containing water with less than 3,000 mg/L of dissolved solids was estimated from electrical resistivity logs. Of the twelve sections , section A-A' is closest to the proposed Class VI injection well locations.

Jasper Aquifer

The Jasper Aquifer, along with the overlying Chicot and Evangline Aquifers, are sub-units of the Gulf Coast Aquifer. There are 1,468 wells in the TWDB Groundwater database, completed in the Jasper Aquifer, for the withdrawal of water. These wells are drilled as deep as 6,024 feet[5] and are capable of yielding as much as 3,000 gallons of water per

[4] Also published as the US Geological Survey Open-File Report 77-712, March 1978.
[5] Based on an examination of the TWDB Groundwater database.

minute or more in certain areas.[6] Jasper Aquifer wells closest to the proposed injection wells are shown on Attachment 5, Section Well Map

By matching locations and well names, I identified nine of the 11 logs used as a basis for section A-A' in the Texas Water Development Board BRACS GIS database. Attachment 5. Section Well Map also illustrates the locations of those nine wells with respect to the three proposed injections wells. Based on their relative locations, the Humble Oil and Refining Company Tyrell Combest Well No. 21, northeast from the proposed injection wells (well 8 on the section), is the closest to the proposed injection well locations.

On Attachment 6. Proposed Injection Zone I have delineated the proposed injection zones on this closest Humble Oil and Refining Company Tyrell Combest Well No. 21 log. The base section of this attachment is Figure 2. Stratigraphic and Hydrogeologic Section A-A' from Report 236.

Although there are slight stratigraphic discrepancies at the Texas-Louisiana border, attributable to different surface geology interpretations at the State Line, all of the interpretations identify the Jasper Aquifer as encompassing the Fleming Formation, one of two stratigraphic intervals proposed by ExxonMobil for injection. Furthermore, based on the stratigraphic and hydrogeologic interpretation of the Humble Oil and Refining Company Tyrell Combest Well No. 21 log by US Geological Survey and Texas Department of Water Resources staff, the proposed injection zone would span about 2,000 feet of the Jasper Aquifer. The overlying Burkeville confining system would tend to trap the injected fluids within the Jasper Aquifer, but not prevent their migration within the aquifer

The analysis of geophysical well logs in the Attachment 4 report indicate that the Jasper Aquifer is laterally extensive. Hydrogeologic interpretations by the U.S. Geological Survey and the Texas Department of Water Resources identify the Jasper Aquifer in the Texas coastal plain subsurface stratigraphy from the Sabine River to the Rio Grande.

[6] Baker, 1986, page 19..

Dissolved Solids Concentrations

The Safe Drinking Water Act requires protection of aquifers with dissolved solids concentrations up to 10,000 mg/L. Despite this requirement, the applicant provided no information regarding dissolved solids concentrations in the Jasper Aquifer proposed injection zone.

Attachment 4. Report 236: Stratigraphic and Hydrogeologic Framework of Part of the Coastal Plain of Texas delineates sands containing less than about 3,000 mg/L dissolved solids based on electrical resistivity logs. These delineations are not, however, sufficient to establish underground sources of drinking water protected by the Safe Drinking Water Act, which protects groundwater up to 10,000 mg/L dissolved solids.

Total dissolved solids concentrations in the proposed injection zone water could reasonably be determined by directly sampling formation water samples extracted from the proposed injection zones. Dissolved solids concentrations can also be estimated from geophysical well logs. The application and proposed draft permit fail, however, to include information from either of these potential sources. There is, therefore, no information demonstrating that the proposed draft permit would protect underground drinking water sources, as required.

Failure to Monitor Injection Zone Aquifer

Despite proposed injection into the Jasper Aquifer, the applicant proposes to monitor only three wells to protect underground sources of drinking water (USDW). See Table 5-5, page 198, of the application. These wells would be screened at intervals of 320 to 340 feet below grade, or higher. The deepest proposed USDW monitoring well would be screened about 3,000 feet higher than the Jasper Aquifer, into which the injection is proposed. The application and proposed permit do not provide any monitoring of water quality impacts from the proposed injection to the known Jasper aquifer.

Attachment 1. Documents and Sources Reviewed and/or Relied Upon

Aronow, S. 1971. Report 133: Ground-Water Resources of Chambers and Jefferson Counties, Texas. Texas Water Development Board. U.S. Geological Survey.

Baker, Jr., E.T. 1978. Open File Report 77-712: Stratigraphic and Hydrogeologic Framework of Part of the Coastal Plain of Texas. Texas Department of Water Resources, Texas Water Development Board.

Baker, Jr., E.T. 1979. Report 236: Stratigraphic and Hydrogeologic Framework of Part of the Coastal Plain of Texas. U.S. Geological Survey, Texas Department of Water Resources.

Baker, Jr., E.T. 1986. Report 295: Hydrology of the Jasper Aquifer in the Southeast Texas Coastal Plain. Texas Water Development Board. U.S. Geological Survey.

Delfiner, P. 2007. Three Statistical Pitfalls of Phi-K Transforms. *Reservoir Evaluation & Engineering*, December 2007: 609-617.

Jorgensen, D.G. 1989. Using Geophysical Logs to Estimate Porosity, Water Resistivity, and Intrinsic Permeability, Water-Supply Paper 2321. U.S. Geological Survey.

Keys, W. S. and MacCary, L.M. 1985. Techniques for Water-Resources Investigations of the United States Geological Survey; Chapter E1, Application of Borehole Geophysics to Water-Resources Investigations. U.S. Geological Survey.

Laughlin, K., Croskrey, Sutton, A. S. and AlKurdi. A. 2023. Open File Report 12-02: Brackish Resources Aquifer Characterization System Database Data Dictionary, Sixth Edition Texas Water Development Board.

LBG-Guyton Associates. 2003. Brackish Groundwater Manual for Texas Regional Water Planning Groups. NRS Consulting Engineers. Texas Water Development Board.

Mace, R.E., Davidson, S.C., Angle, E.S. and Mullican, W.F. 2006. Aquifers of the Gulf Coast of Texas. Texas Water Development Board.

No author. 1949. Well Spontaneous-Potential Log, #1 Beavers Well, So. Nome Area, Jefferson County, Texas. Sun Oil Company. Filing No. SG-7[unreadable].

No author. 1956. Well Spontaneous-Potential Log, Tyrell Combest No. 21, Amelia Field, Jefferson County, Texas. Humble Oil and Refining Company. Filing No. SG-72.

Thorkildsen, D. and Quincy, R. 1990. Report 320: Evaluation of Water Resources of Orange and Eastern Jefferson Counties, Texas. Texas Water Development Board.

Texas Water Development Board. 1993. Report 343: Borehole Geophysical Techniques for Determining the Water Quality and Reservoir Parameters of Fresh and Saline Water Aquifers in Texas, Volume I of II; Chapter 14: Techniques for Calculating Cw and TDS from Logs.

Texas Water Development Board. 2016. The Future of Desalination in Texas: 2016 Biennial Report on Seawater and Brackish Groundwater Desalination, 85th Legislative Session, by the Texas Water Development Board, December 1, 2016.

Texas Water Development Board. 2020. Groundwater Conservation Districts Overlapping Brackish Groundwater Production Zones, May 13, 2020.

Texas Water Development Board. 2024. Brackish Aquifers of Texas, May 21, 2024.

Attachment 1. Documents and Sources Reviewed and/or Relied Upon

Texas Water Development Board. 2024. Brackish Wells, May 21, 2024.

Texas Water Development Board. 2024. Brackish Wells and Brackish Aquifers, May 21, 2024.

Texas Water Development Board. 2024. Groundwater Database Wells, May 21, 2024.

U.S. Environmental Protection Agency. 2023. Geologic Sequestration Data Tool (GSDT).

D. Lauren Ross, Ph. D., P. E. – Principal Engineer

Dr. Lauren Ross is an environmental engineer and owner of Glenrose Engineering, Inc. in Austin, Texas since 1987.

Education

Ph. D. Civil Engineering, University of Texas at Austin; 1993
M. S. Civil Engineering, Colorado State University, Fort Collins, Colorado; 1982
B. S. Civil Engineering, University of Texas at Austin; 1977, *summa cum laude*

Registration, Certification, and Training

Registered Professional Engineer: State of Texas, 1984
OSHA 40-hour Hazardous Waste Health and Safety Training, 1993
Certified Professional in Erosion and Sediment Control, 2009
U. S. E.P.A. 5-Day Water Quality Analysis Simulation Program (WASP), 2016

Experience

Wastewater Engineering and Permitting

- Design of a constructed wetland system to treat high biochemical oxygen demand and concentrated nutrient wastewater from a tofu production facility.
- Soil, spring, and groundwater monitoring system recommendations for Texas land application systems: Barton Creek West Water Supply Corporation, Rocky Creek Wastewater Utility, Austin Highway 290 (Headwaters), City of Dripping Springs, Travis County Municipal Utility District No. 4, Scenic Greens, Hays County Water Control and Improvement District No. 1, Prentiss Properties Acquisition Limited Partnership.
- Water balance modeling for septic systems in the Barton Springs Edwards Aquifer Recharge and Contributing Zones.
- Water balance modeling for Three Rivers Refinery wastewater effluent irrigation.
- Environmental sampling and/or data analysis associated with wastewater effluent irrigation at Barton Creek West WSC, Hays County Water Control and Improvement District No. 1 (Belterra), Hays County Municipal Utility District No. 5 (Highpointe) Three Rivers Refinery, and West Cypress Hills wastewater effluent irrigation.

Ground Water

- Pollution concentration predictions in Barton Springs from a pipeline leak using a numerical model based on field dye trace data.
- Evaluation of environmental data to determine coal combustion waste disposal impacts in the Four Corners region.
- Groundwater contamination study, waste evaluation, sampling, and analysis for petroleum refinery.
- Closed landfill study: field investigation, compiled and reviewed historical records, assessed potential environmental consequences, installed, sampled, and evaluated data from monitoring wells.
- Conducted geologic assessment, designed and installed groundwater monitoring well system for municipal landfills.
- Designed a system to limit methane and leached organic chemical migration from a closed municipal landfill into a karst limestone sole-source drinking water aquifer.

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- Developed groundwater management alternatives to limit withdrawal and related land subsidence.

Environmental Assessment

- Baseline and impact assessment for wastewater line remediation project including evaluation of soils, geology, topography, and flow regimes.
- Environmental Assessment evaluation for a proposed project to convert an inactive crude oil pipeline, largely constructed in 1950, into active service as a high-pressure fuel transmission line. Work included: evaluating historical spill records; calculating statistical failure probabilities for different pipeline reaches and spill sizes; predicting time and concentrations of toxic and carcinogenic constituent migration through and discharge from a karst limestone aquifer; and evaluating the Operational Reliability Assessment performed for the pipeline.

Solid Waste

- Investigated waste metal migration in soil for petroleum land treatment unit.
- Investigated geologic setting and groundwater contamination and designed recovery well system for groundwater remediation at a commercial RCRA waste storage impoundment.
- Designed petroleum waste land treatment units: baseline soil and groundwater characterization; monitor well system design and installation; lysimeter systems; and land treatment demonstrations to determine maximum waste capacity and loading rates.
- Developed sampling procedures and in-place treatment for RCRA waste at electrical generation power plants.
- Managed and prepared technical phases of Industrial Solid Waste Permit Applications under RCRA and Texas Natural Resource Conservation Commission regulations for waste management facilities: land treatment units, surface impoundments, container storage areas.
- Designed closure plans for RCRA waste impoundments to store, treat and dispose of inorganic acids, spent pickle liquor, and organic chemicals.
- Review of proposed municipal solid waste landfill applications.

Water Quality and Engineering Design

- Gravity-flow retention and irrigation water pollution control system for a large hospital complex within the contributing watershed of the karst Barton Springs Aquifer.
- Design of an innovative bioretention water quality control system for a municipal complex located on the Barton Springs Edwards Aquifer Recharge Zone and permitting under Texas Commission on Environmental Quality Edwards Aquifer protection rules.
- Design of an innovative pervious pavement storm runoff detention and treatment system for a proposed parking lot to be located on the Northern Edwards Aquifer Recharge Zone and permitting under stringent City of Austin and Texas Commission on Environmental Quality water quality protection rules.
- Wet pond design and detention basin retrofit to treat stormwater from existing residential and commercial development in the Oak Springs neighborhood in East Austin.
- Combined wet pond and bioretention design for commercial storm runoff.
- Combined wet pond and retention/irrigation design for an existing 162-acre residential development over the sensitive Barton Springs recharge zone in the City of Austin, Texas.

D. Lauren Ross, Ph. D., P. E. – Principal Engineer

- Municipal engineer responsible for all water quality design, review, inspection, rules, and ordinances for the City of Sunset Valley, Texas.
- Analyzed nonpoint pollution sources and structural and non-structural retrofit controls for recharge and contributing zone of a sensitive karst aquifer.
- Analyzed nonpoint pollution sources and structural and non-structural retrofit controls as water quality engineer for the City of Sunset Valley, Texas.
- Technical consultant to the City of Austin on implementation of the 1991 Comprehensive Watersheds Ordinance and associated water quality monitoring system.
- Analyzed stormwater conveyance and flooding potential, designed regional detention basin to protect natural ecological systems for Armand Bayou Master Drainage Study.
- Estimated long-term groundwater yields based on rainfall rates, soil type, and river losses for Chisumbanje region of Zimbabwe, Africa.
- Evaluated land use, soils, agricultural and silvicultural practices to assess non-point pollution potential in the San Jacinto River Basin.
- Designed storm water drainage for subdivisions and regional water detention facilities.

Teaching and Presentations

- Semester Course in Statistics for Environmental Monitoring; University of Texas at Austin; Fall 1995.
- Semester Course in Water Resources, University of Texas at Austin.
- Land Development Seminar; Travis County Bar Association, 12 July 1996.
- Water Quality Protection Programs to Reduce Nonpoint Source Pollution, a presentation to the Barton Springs/Edwards Aquifer Conservation District's Watershed Management: Challenges and Innovations—A Nonpoint Source Pollution Conference, 25 July 1996.
- Presenter at Emerging Issues in Groundwater Regulation panel discussion, Key Environmental Issues in U.S. EPA Region VI conference, hosted by U.S. EPA and the American Bar Association, May 12-13, 1997.
- Short Courses in Statistics for Environmental Monitoring; University of Texas Continuing Engineering Studies Program: Spring 1995, Fall 1995, Spring 1996, Spring 1997, Spring 1998.
- Short Courses in Statistics for Environmental Monitoring; Louisiana Department of Environmental Quality. Focus on surface water sampling considerations, trend analysis and methods to assess the achievement of data quality objectives.

Statistics

- Evaluated surface and groundwater measurements for normality, differences in mean, spatial variability, and time series analysis. Techniques used include Student's t-test, Wilcoxon test, parametric and non-parametric ANOVA, Fourier series decomposition, Shapiro-Wilkes test, and Chi-squared tests.
- Geostatistical analysis and kriging of groundwater transmissivity data.
- Statistically-based sampling design including optimum sample number, stratified random sampling, and assessment of monitoring parameters to achieve efficient sampling designs.

Field/ Laboratory Experience

D. Lauren Ross, Ph. D., P. E. – Principal Engineer

- Field supervision of auger drilling, rotary-bit drilling, well installation, Shelby-tube core and split-spoon sampling, and soil type identification using the Unified Soils Classification System
- Surface, groundwater and hazardous waste sampling for a variety of constituents, including volatile organic constituents, dioxins, nutrients, metals, anions, cations, and other collection-sensitive parameters.
- Laboratory experiments to measure unsaturated hydraulic conductivity, water content versus soil water pressure, and other geophysical soil properties.

Reports and Publications

- *Prefiled Direct Testimony of D. Lauren Ross, PH. D., P.E.,* regarding Cullen RV Resort, LLC for TPDES Permit No. WQ0016309001 on behalf of Brazoria County, submitted on May 9, 2025.
- *Total Petroleum Hydrocarbons: Absher Equine Center; Flatonia, Texas,* prepared for Phillip Poplin, attorney, March 10, 2025.
- *Prefiled Direct Testimony of D. Lauren Ross, PH. D., P.E.,* regarding Application of Municipal Operations, LLC for TPDES Permit No. WQ0016171001 on behalf of Greater Edwards Aquifer Alliance and the City of Grey Forest, submitted on January 3, 2025 and amended on February 18, 2025.
- *Evaluation of Draft Permit WQ0005462000 for Space Exploration Technologies Corporation Deluge Wastewater,* prepared for Marisas Perales, attorney and Lauren Ice, attorney, December 27, 2024.
- *Prefiled Direct Testimony of D. Lauren Ross, PH. D., P.E.,* regarding Application of Corix Utilities (Texas) Inc. for TPDES Permit No. WQ0013977001 on behalf of Environmental Stewardship, December 19, 2024.
- *Prefiled Direct Testimony of D. Lauren Ross, PH. D., P.E.,* regarding Application of Clancy Utility Holdings, LLC for an Operating Permit from the Hays Trinity Groundwater Conservation District on behalf of Save Our Springs Alliance and Save the Pedernales, September 16, 2024.
- *Prefiled Direct Testimony of D. Lauren Ross, PH. D., P.E.,* regarding Application by San Miguel Electric Cooperative, Inc. for Renewal and Major Amendment to Texas Pollutant Discharge Elimination System Permit No. WQ0002043000 on behalf of Swaim, Lively & Shorty, Owners, July 3, 2024.
- *Prefiled Direct Testimony of D. Lauren Ross, PH. D., P.E.,* regarding Application by City of Kyle for a Major Amendment to Texas Pollutant Discharge Elimination System Permit No. WQ001041002, on behalf of San Marcos River Foundation, Inc, May 29, 2024.
- *Total Petroleum Hydrocarbons Present in Soils at the Absher Equine Center, Flatonia, Texas,* prepared for Phillip Polin, attorney, February 19, 2024.
- *Prefiled Direct Testimony of D. Lauren Ross, PH. D., P.E.,* regarding Application of San Miguel Electric Cooperative, Inc. for Renewal/Revision of Permit No. 60, San Miguel Lignite Mine, Areas F, G & H, McMullen County, Texas before the Railroad Commission of Texas, on behalf of Protestants Swaim, Lively, and Shorty Owners, October 9, 2023.
- *Prefiled Direct Testimony of D. Lauren Ross, PH. D., P.E.,* regarding Application by Undine Texas Environmental, LLC for New Texas Pollutant Discharge Elimination System Permit No. WQ0016046001, on behalf of Brazoria County, December 14, 2023.

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- *Prefiled Direct Testimony of D. Lauren Ross, PH. D., P.E.,* regarding Application by SJWTX, Inc. and Mary Jane Cielencki for New Texas Pollutant Discharge Elimination System Permit No. WQ0016052001, on behalf of Protestants Annette Gass, Rita Acker, and Rhonda Luman, July 19, 2023.
- *Prefiled Direct Testimony of D. Lauren Ross, Ph.D., P.E. on Remand,* regarding Application by City of Liberty Hill for Renewal of Texas Pollutant Discharge Elimination System Permit No. WQ0014477001, on behalf of Protestant Stephanie Morris, June 7, 2023.
- *Warrior Oil Tank Well Tank Battery and Associated Contamination,* prepared for Phillip Poplin, attorney, January 2, 2023.
- *Pre-Filed Direct Testimony of D. Lauren Ross, Ph.D., P.E. on Behalf of the Swaim, Lively & Shorty Protestants, regarding San Miguel Electric Cooperative, Inc.'s Application for New Permit, X, Y, and Z Area Lignite Mine, McMullen County, Texas,* Railroad Commission of Texas Docket No. MR-21-00006257, October 11, 2022.
- *Prefiled Direct Testimony of D. Lauren Ross, Ph.D., P.E.* regarding Application by City of Liberty Hill for Renewal of Texas Pollutant Discharge Elimination system Permit No. WQ0014477001, on behalf of Protestant Stephanie Morris, July 20, 2022.
- *Stormwater Control Measures Audit: Water Conservation Supply and Ecosystem Benefits,* memorandum for City of Austin, January 31, 2022.
- *Direct Prefiled Testimony in Application from Kendall West Utility, LLC for a new TPDES Permit WQ0015787001* for Save Our Springs Alliance, January 28, 2022.
- *Storm Water Pollution Prevention Plan for Country Club Creek West; Roy G. Guerrero Park Channel Stabilization, City of Austin C.I.P. No. 5848.026,* for City of Austin, November 2021.
- *Review of Houston Tradeport Municipal Setting Designation Application* for EarthJustice, April 2021.
- *Prefiled Testimony in Application by Silesia Properties, LP for TCEQ Permit WQ0015835001,* for Greater Edwards Aquifer Alliance, Mary 31, 2021.
- *Prefiled Testimony for Application of Cherryville GP, Inc. and Cherryville #5 LTD for new TPDES Permit No. WQ0015738001,* for Save Our Springs Alliance, January 15, 2021.
- *Review of Application to Register Domestic Septage Beneficial Use Site; Jack County, Texas for the Two Bush Community Action Group, October 15, 2020.*
- *Prefiled Testimony in Application of Texas Regional Landfill Company, LP, for MSW Permit No. 1841B* for Marisa Perales, attorney, August 25, 2020.
- *Review of Proposed City of Liberty Hill Sewage Effluent Discharge to the South Fork San Gabriel River,* prepared for Texas RioGrande Legal Aid, August 12, 2020.
- *Urban Sinkhole Evaluation and Mitigation Preliminary Engineering Report* with Geosyntec Consultants, January 31, 2020.
- *Prefiled Testimony in Application by Aqua Texas, INC> for TPDES Permit No. WQ0015642001,* for Mary Conner, attorney, June 21, 2019.
- *Black Mountain Sand Mine Review,* Wintergarden Groundwater Conservation District, January 2019.
- *Soils, Surface Water and Groundwater Hydrology in the Vicinity of the Peeler Ranch in Atascosa County, Texas,* Mary Whittle, attorney, August 2018.

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- *June 28 to 29, 2018 Field Investigation Report for Peeler Ranch, Atascosa County, Texas,* Mary Whittle, August 2018.
- *Direct Testimony in Application by the City of Dripping Springs for New TPDES Permit No. WQ0014488003,* for Save Our Springs Alliance, July 24, 2018.
- *Sampling Plan for June 28 to 29, 2018 Peeler Ranch Atascosa County, Texas,* Mary Whittle, June 2018.
- *City of Houston Sanitary Sewer Overflow Data Summary: Preliminary Report,* Eric Allmon, attorney, June 2018.
- *Water Quality Control Concept Design; Courtyard Park @ 5811 Southwest Parkway; Austin, Texas* for RealTex Ventures LP, April 11, 2018.
- *Arrowhead Landfill Protestant's Field Protocols,* for EarthJustice, May 26, 2017.
- *Review of Proposed City of Dripping Springs Wastewater Effluent Discharge to Onion Creek,* Protect Our Water, November 2016.
- *Prefiled Testimony on Application of 130 Environmental Park, LLC for Proposed TCEQ Municipal Solid Waste Permit No. 2383,* attorney Marisa Perales, June 2016.
- *Barnes Family Farm Water Availability Report*, Barnes Family Farm, Inc., April 2015.
- *Preliminary Engineering Design of Storm Runoff Treatment System,* Parkside Montessori Community School, February 2015.
- *Declaration regarding Wetlands Development in Galveston Baykeeper, Inc. vs. Trendmaker Homes, Inc.,* Galveston Baykeeper, Inc., November 2014.
- *Prefiled Testimony on Application of DHJB Development, LLC for a Major Amendment to TPDES Permit No. WQ 0014975001,* attorney Mary Conner, October 2014.
- *Potential Improvements to the Join Task Force Municipal Separate Storm Sewer MS4 Permit,* Houston Parks Board, Galveston Bay Foundation, Buffalo Bayou Partnership and Bayou Preservation Association, March 2014.
- *Asher Property Water and Soil Sampling Results* for Phillip Poplin Law Office, 23 January 2014.
- *Circle Acres Environmental Sampling Report*, Ecology Action, January 2014.
- *Potential Improvements to the Harris County Municipal Separate Storm Sewer MS4 Permit*, Houston Parks Board, Galveston Bay Foundation, Buffalo Bayou Partnership, and Bayou Preservation Association, January 2014.
- *Circle Acres Preliminary Engineering Biofilter Design*, Ecology Action, August 2013.
- *Circle Acres Storm Water Management Concept Plan*, Ecology Action, May 2013.
- C*omments on Draft Environmental Assessment of the Proposed Longhorn Pipeline Reversal*, City of Austin, September 2012.
- *Water for Coal-Fired Power Generation in Texas: Current and Future Demands,* for Sierra Club, February 2012.
- *Land-Applied Wastewater Effluent Impacts on the Edwards Aquifer,* for Greater Edwards Aquifer Alliance and Save Our Springs Alliance, November 2011.

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- *Proposed White Stallion Coal-Fired Power Plant Water Demands and the Highland Lakes Water Supply,* for Sierra Club, June 2011.
- *Water Treatment Plant #4 Environmental Monitoring Program,* for City of Austin, with INTERA, Inc., June 2011.
- *Remediation to Protect the Conemaugh River from Acidic Groundwater,* for Environmental Integrity Project, Lisa Widawsky, attorney, March 2011.
- *What Would You Drink if the Well Ran Dry? Nolan County Water and the Proposed Tenaska Coal-Fired Power Plant,* for Lone Star Chapter of the Sierra Club, November 2010.
- *A Unique Water Quality Retrofit Project in Austin, Texas,* with Scott Muchard, Rebecca Batchelder, and Tom Franke, StormCon; The North American Surface water Quality Conference & Exposition, August 5, 2010, San Antonio, Texas.
- *Potential Stormwater Impacts from Sand and Gravel Excavation on the Llano River, Texas,* for Brad Rockwell, attorney, February 2010
- *Engineering Analysis of Jeremiah Ventures L.P. Propose Wastewater Irrigation Areas,* submitted to City of Austin, December 2009.
- *Pease Park Water Quality and Stream Restoration: Preliminary Engineering Report*, with PBS&J, Inc., for City of Austin, August 2009.
- *Fort Branch Watershed Management Area Reaches 6 and 7; Final Environmental Assessment,* for City of Austin, August 2009.
- *Tannehill Branch Wastewater Line Environmental Assessment,* for City of Austin, August 2009.
- *Water Quality and Quantity Impacts from Proposed South Texas Plant Expansion,* submitted to Sustainable Energy and Economic Development (SEED) Coalition, April 2009.
- *City of Sunset Valley Environmental Monitoring Program: Air Quality,* submitted to the City of Sunset Valley, Texas, November 2008.
- *Recommendations to Stabilize Construction at Ranches at Hamilton Pool,* submitted to Brad Rockwell, attorney, October 2008.
- *Williamson Tributary 2 Water Quality Retrofit: Preliminary Design,* prepared for the City of Austin, October 2008.
- *Twin Oaks Community: Conceptual Design for Tofu Wastewater Treatment,* submitted to Twin Oaks Intentional Community, June 2008.
- *City of Sunset Valley Surface Water Quality Monitoring Program,* for the City of Sunset Valley, Texas, June 2008.
- *Storm Sewer Retrofit Alternatives to Improve Water Quality in Fort Branch Creek Reaches 6 and 7,* for City of Austin, December 2007.
- *Lundelius-McDaniel Water Quality Retrofit Project: Phase I Environmental Assessment* for HDR Engineering, Inc., September 2007.
- *Effects of Four Corners Power Plant Coal Combustion Waste Disposal on Surface and Groundwater Quality,* submitted to Lisa Evans, Earth Justice Attorney, August 2007.
- *Preliminary Review of the McCarty Road Landfill Proposed Major Permit Amendment*, submitted to Monica Jacobs, Attorney, August 2007.

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- *Surface Water and Sediment Sample Results Associated with the Walsh Cresson Ranch and Walsh West Ranch,* submitted to Mary Sahs, attorney, May 2007.
- *Biofiltration Water Quality Control Design Standards,* submitted to the City of Sunset Valley, Texas, 2007.
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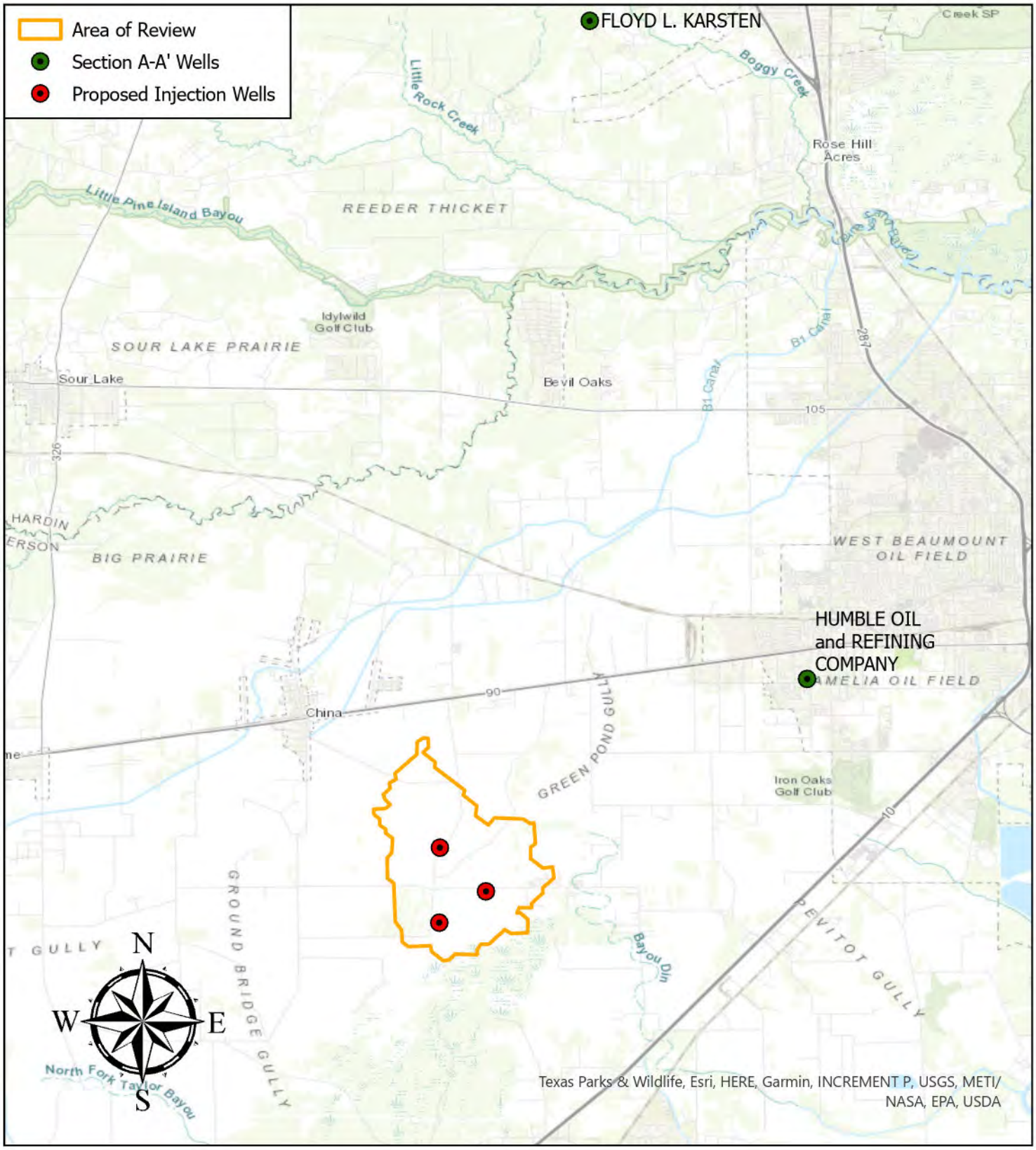


GLENROSE ENGINEERING
TBPELS # F4092

STATE OF TEXAS
D. LAUREN ROSS
56647
LICENSED PROFESSIONAL ENGINEER

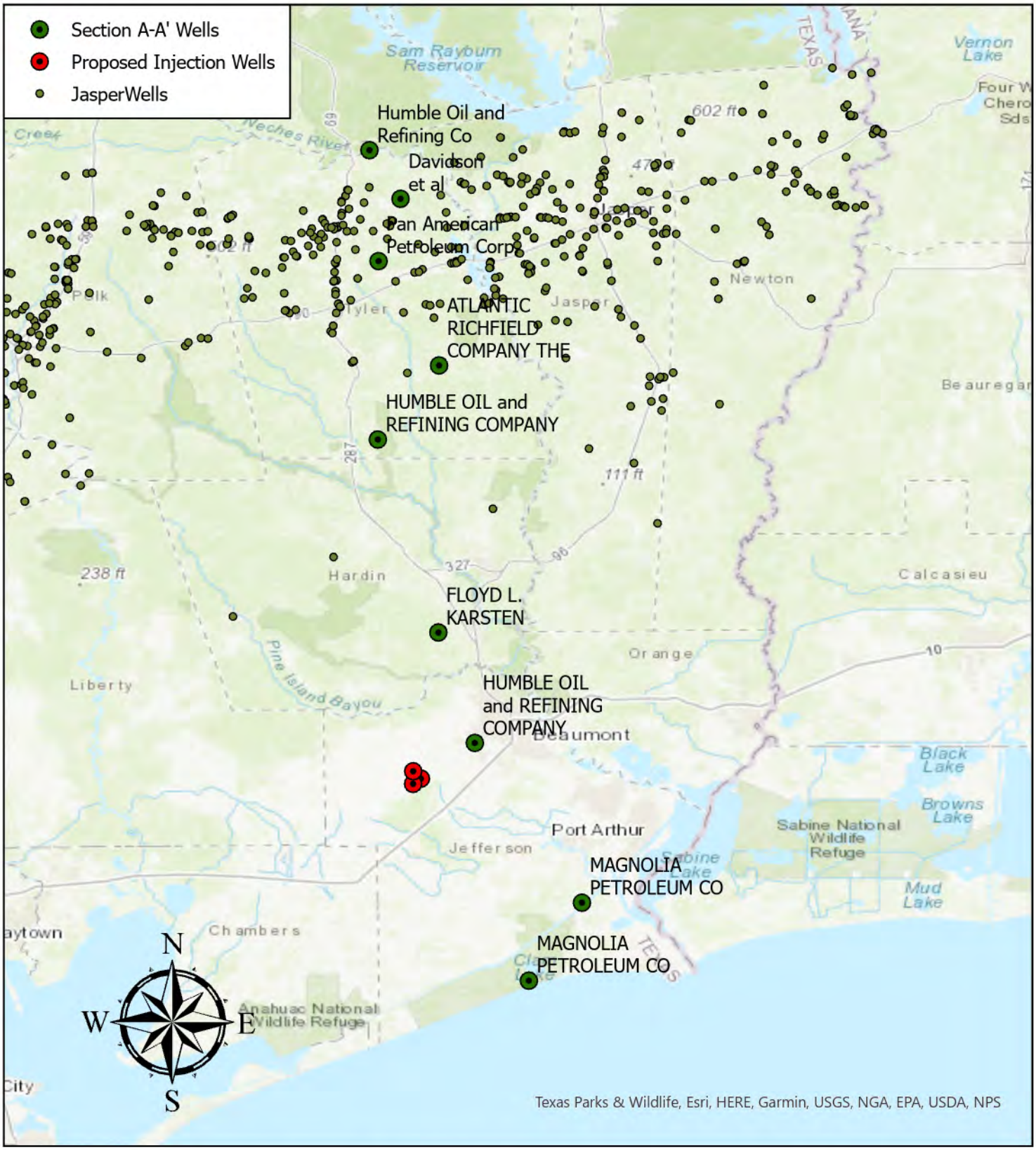
D. Lauren Ross

Digitally signed by D. Lauren Ross
DN: cn=D. Lauren Ross, o=Glenrose Engineering, Inc., ou, email=lauren@glenrose.com, c=US
Date: 2025.08.04 17:01:03 -05'00'

Proposed injection well locations are based on latitude and longitude in the permit application. The area of review was digitized from Figure 5-4, Location of Pre-Operation Data Collection and USDW Monitoring Wells by ERM, revised 07/17/2024, page 188/253 of the Draft Permit file.

0 1 2 4 Miles

Attachment 3. Injection Well Map



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D. Lauren Ross

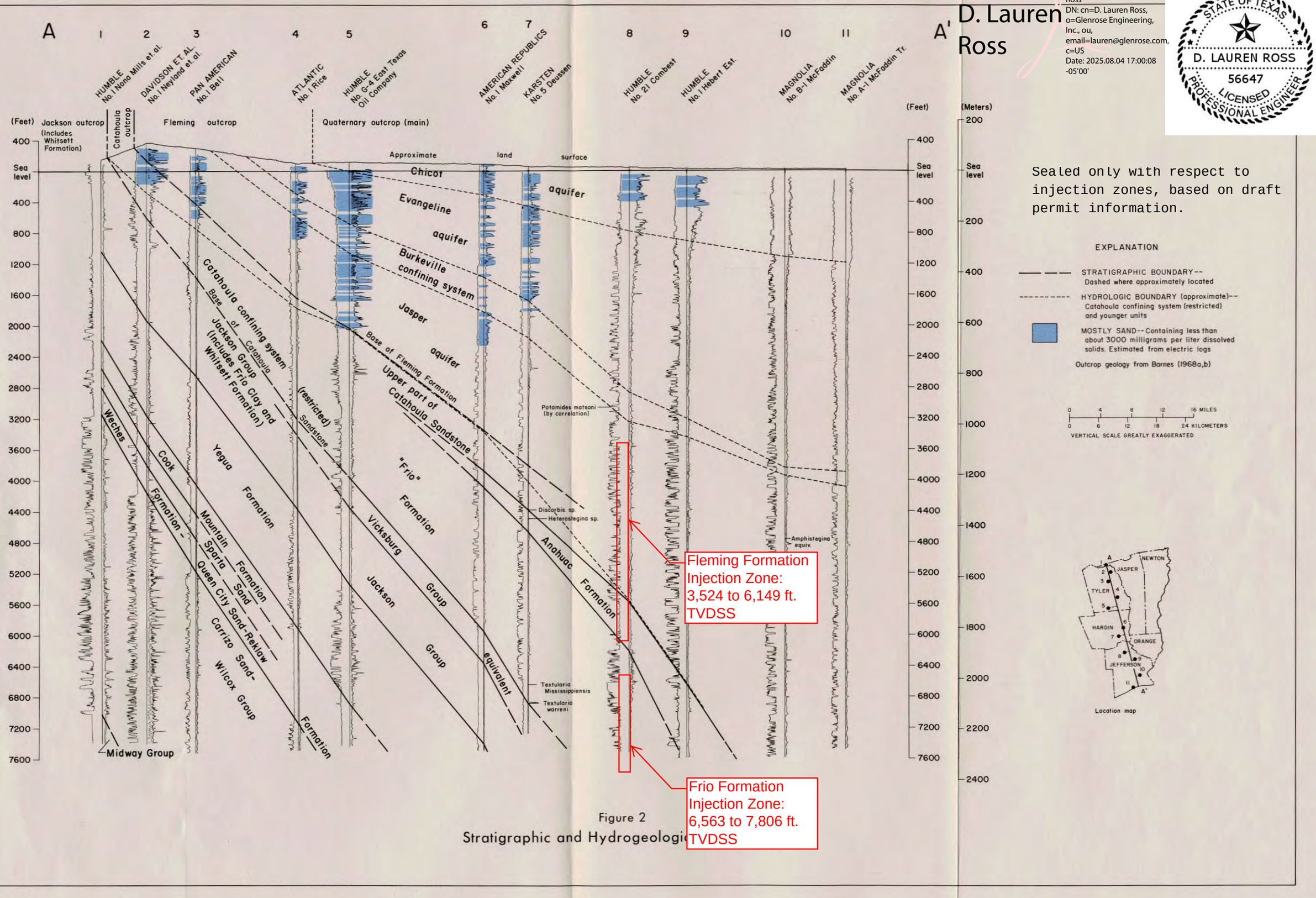
Digitally signed by D. Lauren Ross
DN: cn=D. Lauren Ross, o=Glenrose Engineering, Inc., ou, email=lauren@glenrose.com, c=US
Date: 2025.08.04 17:00:36 -05'00'

Proposed injection well locations are based on latitude and longitude in the permit application. Section A-A' well locations were determined by matching well names on the section to names in the Texas Water Development Board BRACS GIS database.

0 5 10 20 Miles

Attachment 5. Section Well Map

Sealed only with respect to injection zones, based on draft permit information.



EXPLANATION

STRATIGRAPHIC BOUNDARY-- Dashed where approximately located

HYDROLOGIC BOUNDARY (approximate)-- Catahoula confining system (restricted) and younger units

MOSTLY SAND-- Containing less than about 3000 milligrams per liter dissolved solids. Estimated from electric logs

Outcrop geology from Barnes (1968a,b)

0 4 8 12 16 MILES
0 6 12 18 24 KILOMETERS
VERTICAL SCALE GREATLY EXAGGERATED

Location map

Figure 2
Stratigraphic and Hydrogeologi