Railroad Commission of Texas
Class V Geothermal Injection Well Update

Jared Ware & Leslie Savage, P.G. - Oil & Gas Division

July 2025

Agenda

- Botton Line Up Front
- Regulatory & Organizational Overview
- Shallow Closed-Loop Geothermal Injection Wells
- Deep Geothermal Injection Wells
- Additional Information Summarized
- Question & Answer

Bottom Line Up Front

- The Class V shallow geothermal injection well "permit by rule" process is working
- The Class V deep geothermal injection well rule is in development through 1st Quarter FY26
- Expect any new or updated geothermal forms to go into effect with the new rule update
- Expect additional information on forming a geothermal energy policy group in 1st Quarter FY26

Oil & Gas Division - Functions

- **Administrative Compliance**
  - Financial Assurance, Drilling Permits, Well Compliance, Production Audit, and Well Mapping
  - Review applications and issue drilling permits for oil and gas wells & waste haulers

- **Technical Permitting**
  - Underground Injection Control, Geological Advisory Unit, Environmental Permits Unit (waste, recycling, and reclamation) and Special Injection Permits Unit *
  - Class II, III, V and VI programs

** Class V Geothermal: Special Injection Permit (SIP) Unit*

- **Field Operations**
  - HQ & District Offices - "Administrative to Emergencies"
  - Inspections (Compliance, Enforcement, Emergencies and Investigations)
  - Well plugging and cleanup programs

Division Organization & Core Responsibilities

Issue organization reports (P5 forms) and accept operator financial assurance.

Receives Class V permit applications; issues permit.

Perform routine inspections, enforce RRC rules, respond to emergencies 24/7.

Conduct senior administrative and technical tasks; coordinate with outside stakeholders.

All directorates have tasks associated with geothermal regulation

Geothermal Regulation (Texas Natural Resources Code)

- **Title 5. Geothermal Energy and Associated Resources**
  - **Chapter 141: Geothermal Resources**
  - **Subchapter B: Powers And Duties Of The Railroad Commission**
  - **Sec. 141.011: General Duty Of The Railroad Commission**

"Except for duties and responsibilities given to other agencies and officials under this chapter, the commission shall regulate the exploration, development, and production of geothermal energy and associated resources on public and private land for the purpose of conservation and the protection of correlative rights."

https://www.rrc.texas.gov/oil-and-gas/applications-and-permits/injection-storage-permits/geothermal/

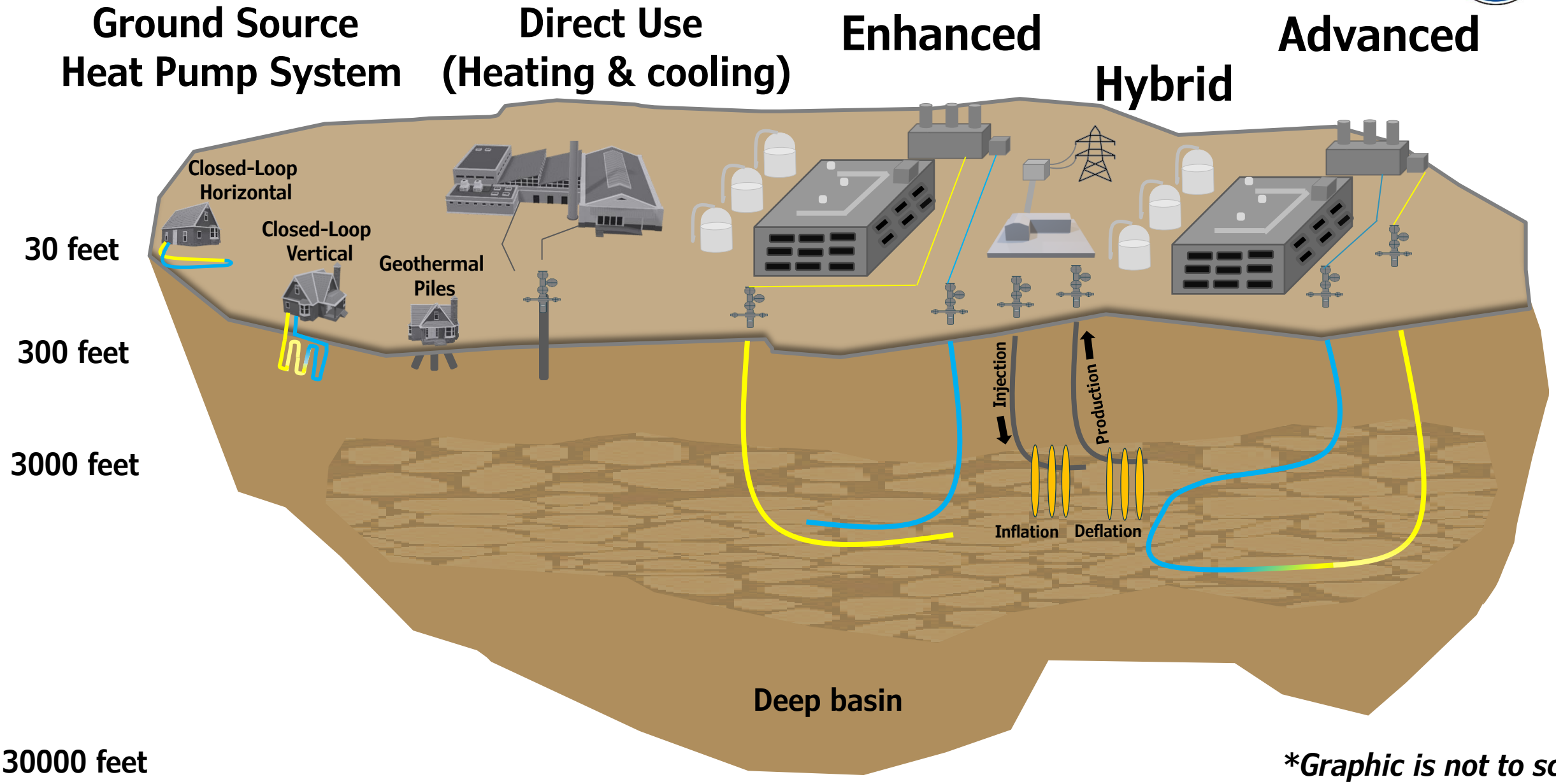
Class V Geothermal Jurisdiction

- **RRC has jurisdiction over closed-loop and deep open-loop geothermal injection wells**
- **RRC can adopt rules as necessary to regulate**
- **RRC may issue permits for geothermal injection wells**
- **Includes individual permits, general permits, or permits by rule**

Statutes & Regulations (88th Session)

- **Senate Bill 785: Amended the Texas Natural Resources Code**
  - Defines heat as a by-product of geothermal energy and associated resources
  - Excludes mineral, oil or gas, or any product of oil or gas in the definition
- **Senate Bill 786: Amended the Texas Water Code**
  - Defines closed-loop geothermal injection well
  - Transfers all TCEQ functions and activities that relate to the regulation of closed-loop geothermal injection wells to the RRC.
- **Senate Bill 1210: Amended the Texas Natural Resources Code**
  - Further defines “geothermal energy and associated resources”
  - Allows operators to convert orphaned oil or gas wells into geothermal wells
  - Defines “Energy conservation well” as a well used for the retention of energy

Categories of Class V Geothermal Wells



*Graphic is not to scale

Class V Wells (Geothermal) – Who regulates what

FY25

	Shallow	Deep
Closed Loop	**Railroad Commission of Texas** - *RRC has jurisdiction over closed-loop geothermal injection wells based on Senate Bill 786.* - *Chapter 6 (Geothermal Resources), Subchapter A* - *Adopted 1/6/2025* **New rule in effect**	**Railroad Commission of Texas** *- Regulate the exploration, development, and production of geothermal energy and associated resources under Section 141.011, Natural Resources Code.* *- Senate Bill 786* **New rule in development**
Open Loop	Texas Commission on Environmental Quality - *27.037, Water Code* - *331.11, Administrative Code* Texas Department of Licensing and Regulation *- 76.10, Administrative Code*	**Railroad Commission of Texas** *- 141.011, Natural Resources Code* *- 141.012, Natural Resources Code outlines consultation with TCEQ*

Shallow Closed-Loop Geothermal Systems (Chapter 6)

- **Verifies requirements for "permit by rule"**
  - No RRC permitting fee
  - Well report submitted to RRC within 30 days of completion
- **Outlines requirements for owners, drillers and installers**
- **Updates technical & construction specifications**
  - Defines a closed-loop geothermal system
  - Removed legacy terminology specific to open loop systems
  - Removed legacy terminology specific to subsurface pumps
- **Describes relationships among other regulating entities**
  - Groundwater Conservation Districts (GCD), TCEQ and TDLR

Geothermal Rule 6.101 - Purpose & Scope

- Implements the Texas state program for the regulation of shallow closed-loop geothermal systems under the RRC's jurisdiction.
- Consistent with state and federal law for the protection of fresh water.
- Includes regulation of
  - The drilling of the borehole
  - The completion of the well
  - The construction, operation, and plugging of shallow closed-loop geothermal systems.

Geothermal Rule – Applicability & Compliance

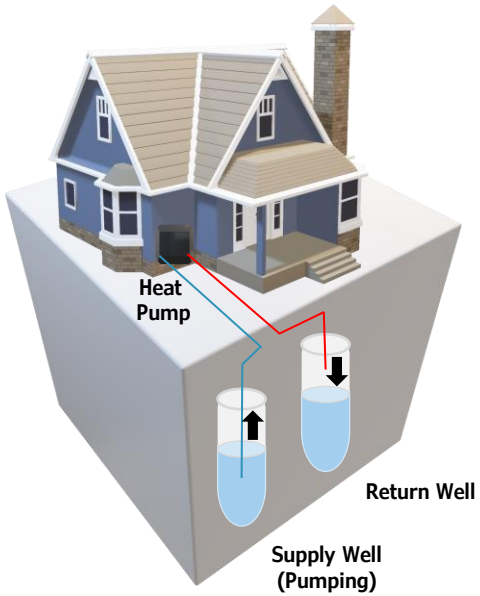
- **Any shallow closed-loop geothermal system constructed before January 6, 2025, is exempt from the current rule requirements.**

- **It is not exempt if the system is altered, deteriorated, abandoned, or determined by the Director to:**
  - **(1) encounter groundwater that is detrimental to human health and the environment or cause pollution to land, surface water, or other groundwater;**
  - **(2) cause a violation of primary drinking water regulations under 40 CFR Part 142; or**
  - **(3) otherwise adversely affect human health or the environment**

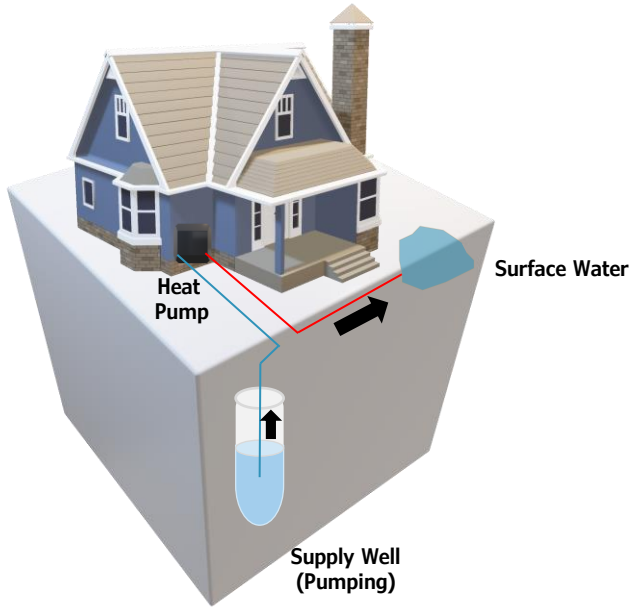
Geothermal Rule – Applicability & Compliance Cont.

- **The rule does not apply to:**
  - **(1) open-loop air-conditioning return flow wells used to return water that has been used for heating or cooling in a heat pump to the aquifer that supplied the water;**
  - **(2) other geothermal injection wells; or**
  - **(3) pond/lake geothermal heat pump systems.**

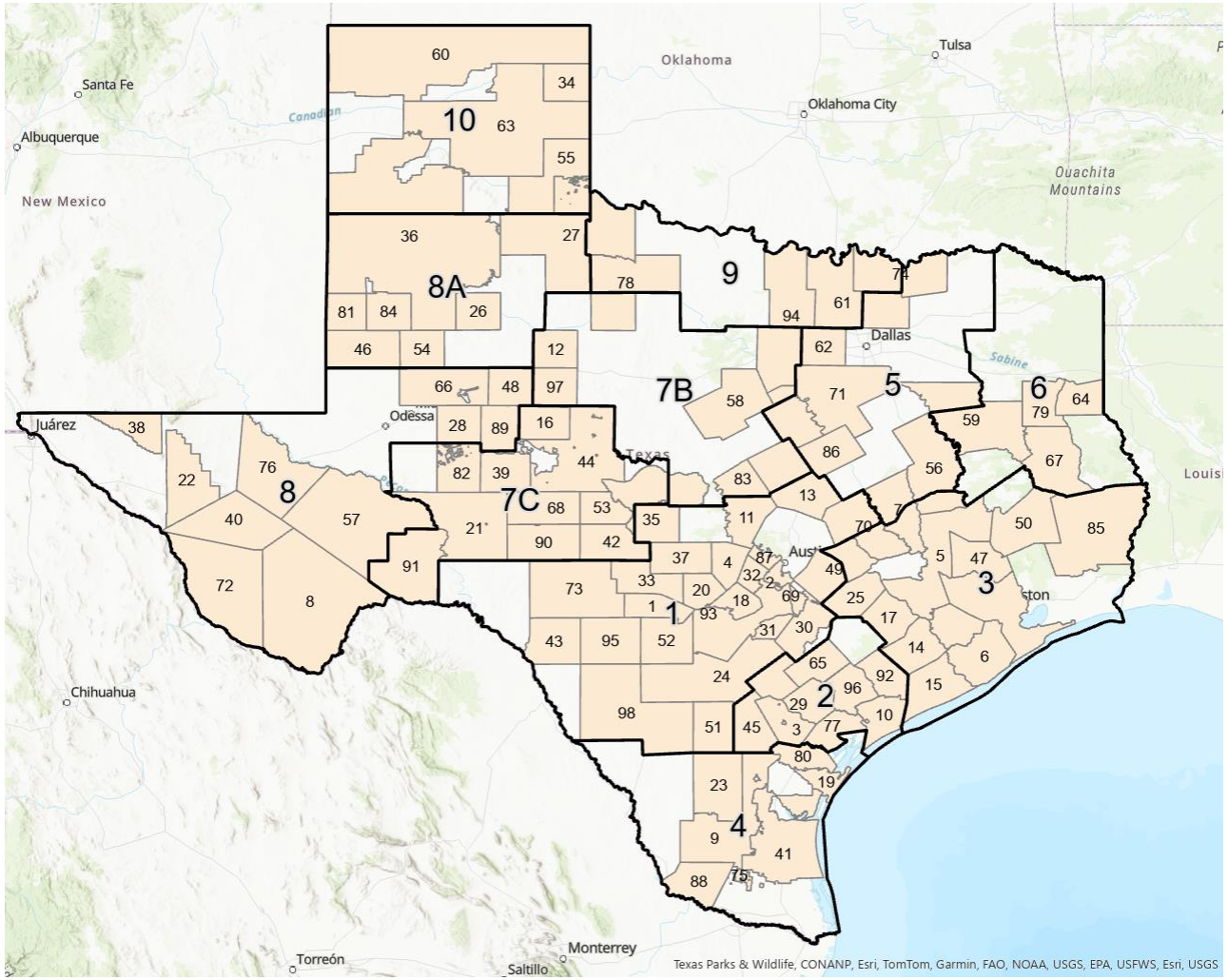
System discharging to ground water



System discharging to surface water



RRC Districts & GCDs: Areas of Responsibility

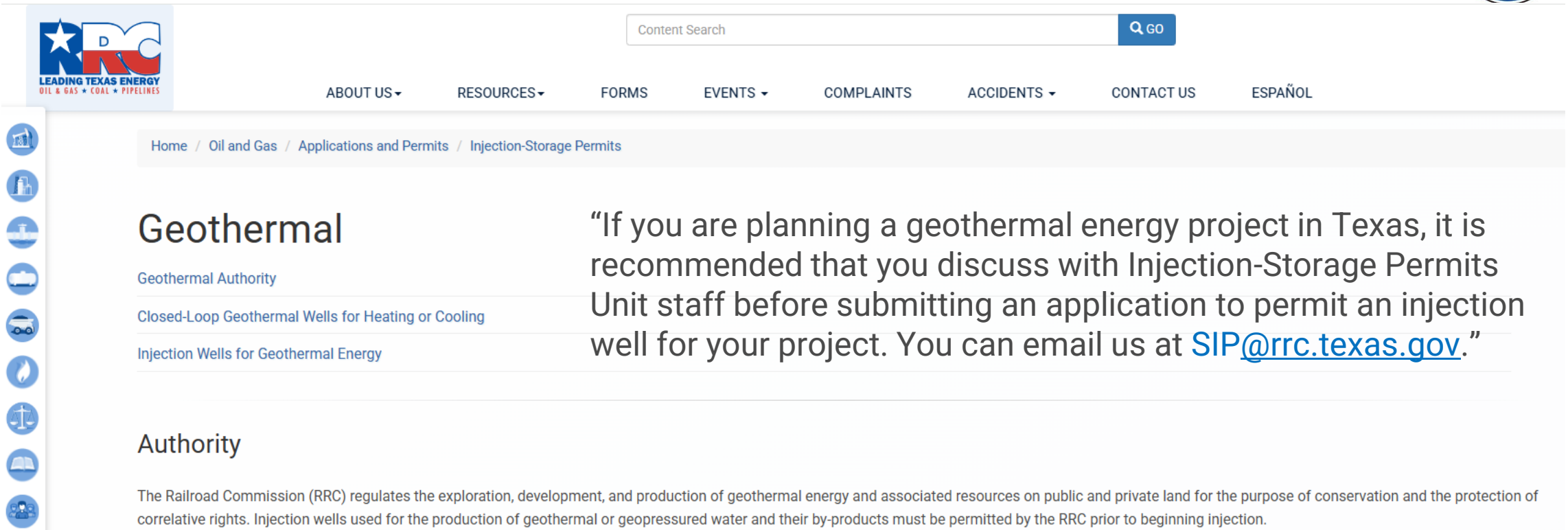


Contact RRC District Offices for

- Field Operations / Activities
- P-13 Form Information
- Emergencies

District	City	Address	Phone / FAX
1	San Antonio	112 E. Pecan Street, Suite 705 (map) San Antonio, TX 78205 san_antonio@rrc.texas.gov	210-227-1313 210-227-4822
2	San Antonio	112 E. Pecan Street, Suite 705 (map) San Antonio, TX 78205 san_antonio@rrc.texas.gov	210-227-1313 210-227-4822
3	Houston	1919 N Loop West, Suite 620 (map) Houston, TX 77008 Houston@rrc.texas.gov	713-869-5001 713-869-9621
4	Corpus Christi	10320 I-37 (map) Corpus Christi, TX 78410 Corpus_Christi@rrc.texas.gov	361-242-3113 361-242-9613
5	Kilgore	100 Bane Blvd (map) Henderson, TX 75652 kilgore@rrc.texas.gov	903-655-1840
6	Kilgore	100 Bane Blvd (map) Henderson, TX 75652 kilgore@rrc.texas.gov	903-655-1840
7B	Abilene	1969 Industrial Blvd. (map) Abilene, TX 79602 Abilene@rrc.texas.gov	325-692-0404 325-692-0273
7C	San Angelo	622 South Oakes St, Suite J (map) San Angelo, TX 76903 san_angelo@rrc.texas.gov	325-657-7450 325-657-7455
8	Midland	10 Desta Dr, Suite 500 E (map) Midland, TX 79705 midland@rrc.texas.gov	432-684-5581 432-684-6005
8A	Lubbock	6302 Iola Avenue, Suite 600 (map) Lubbock, TX 79424 DOLubbock8A@rrc.texas.gov	806-698-6509 806-698-6532
9	Wichita Falls	5800 Kell Blvd, Suite 300 (map) Wichita Falls, TX 76310 wichita_falls@rrc.texas.gov	940-723-2153 940-723-5088
10	Pampa	200 West Foster, Room 300 (map) Pampa, TX 79065 pampa@rrc.texas.gov	806-665-1653 806-665-4217

RRC Geothermal Webpage



https://www.rrc.texas.gov/oil-and-gas/applications-and-permits/injection-storage-permits/geothermal/

Texas Administrative Code – Geothermal Rules

View TAC

TITLE 16	ECONOMIC REGULATION
PART 1	RAILROAD COMMISSION OF TEXAS
CHAPTER 6	GEOTHERMAL RESOURCES
SUBCHAPTER A	SHALLOW CLOSED-LOOP GEOTHERMAL SYSTEMS

Rules

§6.101	Purpose and Scope
§6.102	Definitions
§6.103	Applicability and Compliance
§6.104	Authorization by Rule
§6.105	Registration of a Shallow Closed-Loop Geothermal System for Authorization by Rule
§6.106	Construction Standards
§6.108	Pump Installer Requirements
§6.109	Operational Standards
§6.110	Well Reports
§6.111	Plugging
§6.112	Enforcement and Penalties

https://texas-sos.appianportalsgov.com/rules-and-meetings?chapter=6&interface=VIEW_TAC&part=1&subchapter=A&title=16

TITLE 16 ECONOMIC REGULATION
PART 1 RAILROAD COMMISSION OF TEXAS
CHAPTER 6 GEOTHERMAL RESOURCES

SUBCHAPTER A SHALLOW CLOSED-LOOP GEOTHERMAL SYSTEMS

§6.101 Purpose and Scope

This subchapter implements the state program for the regulation of shallow closed-loop geothermal systems under the jurisdiction of the Commission consistent with state and federal law for the protection of fresh water, including regulation of the drilling of the borehole, completion of the well, and the construction, operation, and plugging of shallow closed-loop geothermal systems.

Source Note: The provisions of this §6.101 adopted to be effective January 6, 2025, 50 TexReg 103

§6.102 Definitions

The following terms, when used in this subchapter, shall have the following meanings, unless the context clearly indicates otherwise.

(1) Annular space--The space between the borehole wall and the heat exchange loop installed within the borehole.

(2) Aquifer--A geologic formation that contains enough saturated permeable material to provide significant quantities of water to wells and springs.

(3) Casing--A metal or plastic pipe installed into the borehole to prevent the sides from collapsing and to protect groundwater from contamination.

(4) Commission--The Railroad Commission of Texas.

(5) Director--The director of the Oil and Gas Division or the director's delegate.

(6) Fresh water--Groundwater containing 1000 parts per million (ppm) or less total dissolved solids.

(7) Groundwater conservation district--Any district or authority created under Section 52, Article III, or Section 59, Article XVI, Texas Constitution that has the authority to regulate the spacing of water wells, the production from water wells, or both as defined in Texas Water Code §36.001.

(8) Grouting--The material used to achieve an impervious seal in the borehole after the heat exchange loop has been installed.

(9) Heat exchange loop--A conduit used in shallow closed-loop geothermal heat systems factory manufactured by fusing a U-bend fitting to dual coil polyethylene pipe, with fusion equipment for heat transfer.

(10) Individual permit--A permit, other than an authorization by rule or general permit, for a specific activity at a specific location.

(11) Injection well--A well into which fluids are injected.

(12) License number--The number assigned to a water well driller or pump installer by the Texas Department of Licensing and Regulation (TDLR).

(13) Licensed pump installer--A person licensed by TDLR to install submersible pumps.

(14) Open-loop air conditioning return flow wells--Class V Underground Injection Control (UIC) wells used to return groundwater, which has been circulated through open-loop, heat pump/air condition (HAC) systems, to the subsurface. These wells are regulated by the Texas Commission on Environmental Quality under 30 Texas Administrative Code §331.11 and §331.12.

(15) Owner--The owner of a shallow closed-loop geothermal system subject to the requirements of this subchapter.

(16) Person--A natural person, corporation, organization, government, governmental subdivision or agency, business trust, estate, trust, partnership, association, or any other legal entity.

(17) Pitless adapter--An adapter that provides a water-tight connection between the drop pipe from the submersible pump inside a well and the water line running to the service location. The device not only prevents water from freezing but also permits easy maintenance of the system components without the need to dig around the well.

(18) Pump installer--A person who installs or repairs well pumps and equipment. A person does not have to be a "licensed pump installer" to install, repair, or service above ground pumps for shallow closed-loop geothermal systems.

(19) Shallow closed-loop geothermal injection well--An injection well that is part of a shallow closed-loop geothermal system. These types of wells are limited to a depth of formations that contain water with a total dissolved solids content of 1000 parts per million (ppm) or less.

(20) Shallow closed-loop geothermal system--A closed-loop geothermal injection well, including all heat pumps and tubing, heat transfer fluids, and connections from the injection well to the infrastructure and the geothermal heat exchange system, that operates as a heat source or heat sink in concert with a heating, ventilation, and air conditioning system designed to heat or cool infrastructure. These systems are also called "ground source heat pump systems." All energy used

https://www.rrc.texas.gov/media/l0kfujvw/chapter6-all-effective-jan6-2025.pdf

Geothermal Activities and Outreach

Chapter 6. Geothermal Resources - 1 adopted 12/17/2024

Rule Title & Contact Person :
New rules in Chapter 6 (Senate Bill 786, 2023 session) regarding shallow closed-loop geothermal systems (Jared Ware, 512-463-7336)

Proposal Approved at Conference for Submission to the Texas Register :
09/24/2024 (pdf format)

Proposal Published in the Texas Register :
10/11/2024

Comment Period Ends :
11/12/2024 at 5:00 pm Comments Received

Adoption Approved at Conference :
12/17/2024 (pdf)

Adoption Published in the Texas Register :
1/3/2025

Effective Date of Adoption :

RRC's Geothermal Energy Regulation Activities **Heating Up**

Oil and Gas Division staff have devoted significant time and energy over the past year to integrate and implement a set of geothermal energy laws into a new regulatory framework. A major statutory element of Senate Bill 786 required the RRC to assume responsibility for the Class V closed-loop geothermal program from the Texas Commission on Environmental Quality no later than December 1, 2023. All regulatory processes, information, functions, and resources are now the responsibility of RRC.

The next major task involved creating a new geothermal rule, which included consolidating existing rules to account for changes in the industry. This rule is the first major change in over a decade with respect to geothermal energy and associated resources.

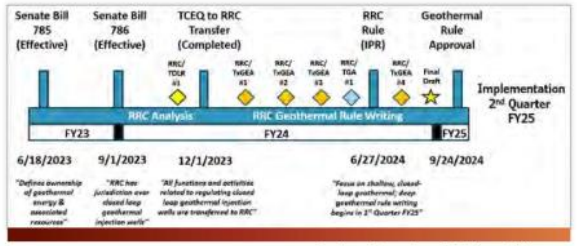
Staff from the Communications Division, Government Relations, Office of General Counsel and Oil and Gas Division assessed the statutory requirements and developed a plan of action to address the rule development process.

Outreach activities included bi-monthly meetings with relevant stakeholders from the geothermal energy community in Texas as well as discussions with the Texas Commission on Environmental Quality, Texas Department of Licensing and Regulation, and the Texas Water Development Board.

Other activities included the development of a mapping database for existing and new geothermal wells, conducting site visits to better understand the geothermal well lifecycle, and attending conferences to learn the latest in geothermal energy design and operations.

The RRC is currently accepting comments on the draft rule until mid-November. Staff will continue to review comments and make any final edits before seeking rule approval from the Commissioners, possibly in December.

Overall, the staff involved in this initiative appreciate that RRC has this rulemaking opportunity. It is also cognizant of the responsibility that comes with RRC being the "agency of choice" when it comes to regulating energy in Texas.



Geothermal Regulatory Timeline and Milestones.

Upshur County Court House – Drilling and Installing a Class V Closed-Loop Geothermal System

Oil & Gas Division Participates in Geothermal Energy Systems Workshop

Last month, Jared Ware, Oil and Gas Division, attended the Geothermal Energy Machinery and System (GEMS) Workshop at the Southwest Research Institute (SwRI) in San Antonio. This collaborative workshop between industry, government and academia provided an opportunity for industry experts to meet in Texas and discuss the technology development needs for advanced geothermal energy systems. The workshop also provided a networking session with the primary goal to advance geothermal power plant technology. The RRC was the single government regulatory organization selected to attend this year's workshop.

Researchers, industry partners and end-users attending this workshop discussed cutting-edge technology and applications, identified technology gaps, outlined research needs and developed guidance to coordinate and direct future pre-competitive R&D activities related to geothermal power technologies. Topics covered ranged from the latest in advanced geothermal system design, enhanced geothermal system operations, improved methodologies for geothermal well injection, lifecycle operations and the changes or updates required to properly regulate the geothermal energy industry. Open discussion and panel sessions allowed workshop participants to discuss the most current technology and methods being used throughout the geothermal industry.

The energy sector has recognized the growing interest in geothermal technology and research initiatives in Texas. This interest includes recent advances in deep geothermal technologies, opportunities for additional surface power generation, and the ability to operate at higher temperatures with higher efficiencies and reliability. Policy efforts in the most recent legislative session include a series of statutes enabling geothermal technology growth and empowering the RRC to regulate geothermal energy and associated resources. The knowledge gained from this workshop will be implemented into the agency's growing geothermal regulatory program. This will benefit employees assigned to participate in a wide range of geothermal regulatory activities that include rulemaking, data systems design, permitting and inspections.

RRC TAKES IMPORTANT STEPS ON GEOTHERMAL ENERGY REGULATION

Texas has been at the forefront of energy regulation and innovation for more than a century, and the RRC has adopted new rules to administer legislation in the geothermal energy front in Texas.

Senate Bill 786 transfers regulatory authority of closed-loop geothermal injection wells from the Texas Commission on Environmental Quality to the Railroad Commission, allowing the RRC jurisdiction and permitting authority for these types of wells.

RRC adopts geothermal rules

On December 17, the Texas Railroad Commission (RRC) adopted new rules relating to Shallow Closed-Loop Geothermal Systems.

A recently-passed state law transferred regulatory authority of these systems from the Texas Commission on Environmental Quality (TCEQ) to the RRC.

This fall, the Texas Groundwater Association worked with members and industry stakeholders to recommend changes on the RRC's proposed rules.

The RRC agreed to consider TGWA's suggestion of developing a best practices guideline document that will help industry comply with the new rules.

Deep Geothermal Rules

- **Any geothermal system other than**
  - **Shallow closed-loop geothermal system**
  - **AC/Heating system under TCEQ jurisdiction**

- **Statutes and rules since 1974**
  - **Chapter 141, Geothermal Resources**
  - **“Geothermal” in RRC oil and gas rules in Chapter 3**

- **Primacy from EPA since 1982**

Deep Geothermal Rules

- **Drafting new rules in Chapter 6 to**
  - **Reference Chapter 3 rules**
  - **Add new requirements for new Geothermal technologies**
    - **Geothermal heat extraction**
    - **Geothermal energy extraction (Geopressured)**

- **Submit new rules to EPA**

Questions

- Class V Geothermal topics covered today?
- Geothermal in general? Send email to SIP@rrc.texas.gov
- UIC in general? Send email to UIC@rrc.texas.gov