Railroad Commission of Texas
Geothermal Program – Regulatory Overview

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Agenda

- Initial Takeaways Up Front
- Regulatory Mission & History
- Organization & Functions
- Geothermal Injection Wells
- Regulatory Information
- Summary

Initial Takeaways Up Front

- The Class V shallow geothermal injection well "permit by rule" process under the Chapter 6 Rule is a success
- The Class V deep geothermal injection well rule is in development through 1st Quarter FY26
- Any new geothermal form requirements will go into effect with the new deep geothermal rule update
- Operators of shallow geothermal injection wells do not require financial assurance or an RRC organizational report

RRC Mission & History

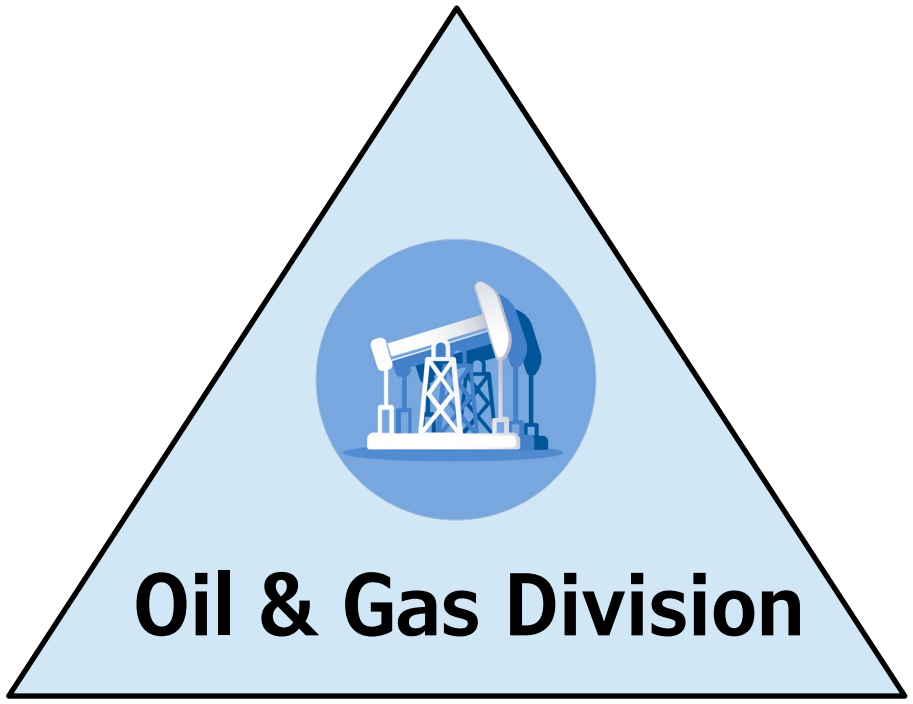
Our mission is to serve Texas by our stewardship of natural resources and the environment, our concern for personal and community safety, and our support of enhanced development and economic vitality for the benefit of Texans.

Commissioner Christi Craddick

Chairman Jim Wright

Commissioner Wayne Christian

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

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 (SIP) Unit *
  - Class II, V and VI programs

* Permits Class V Geothermal, Class V Lithium and Class VI CO_2

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

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/

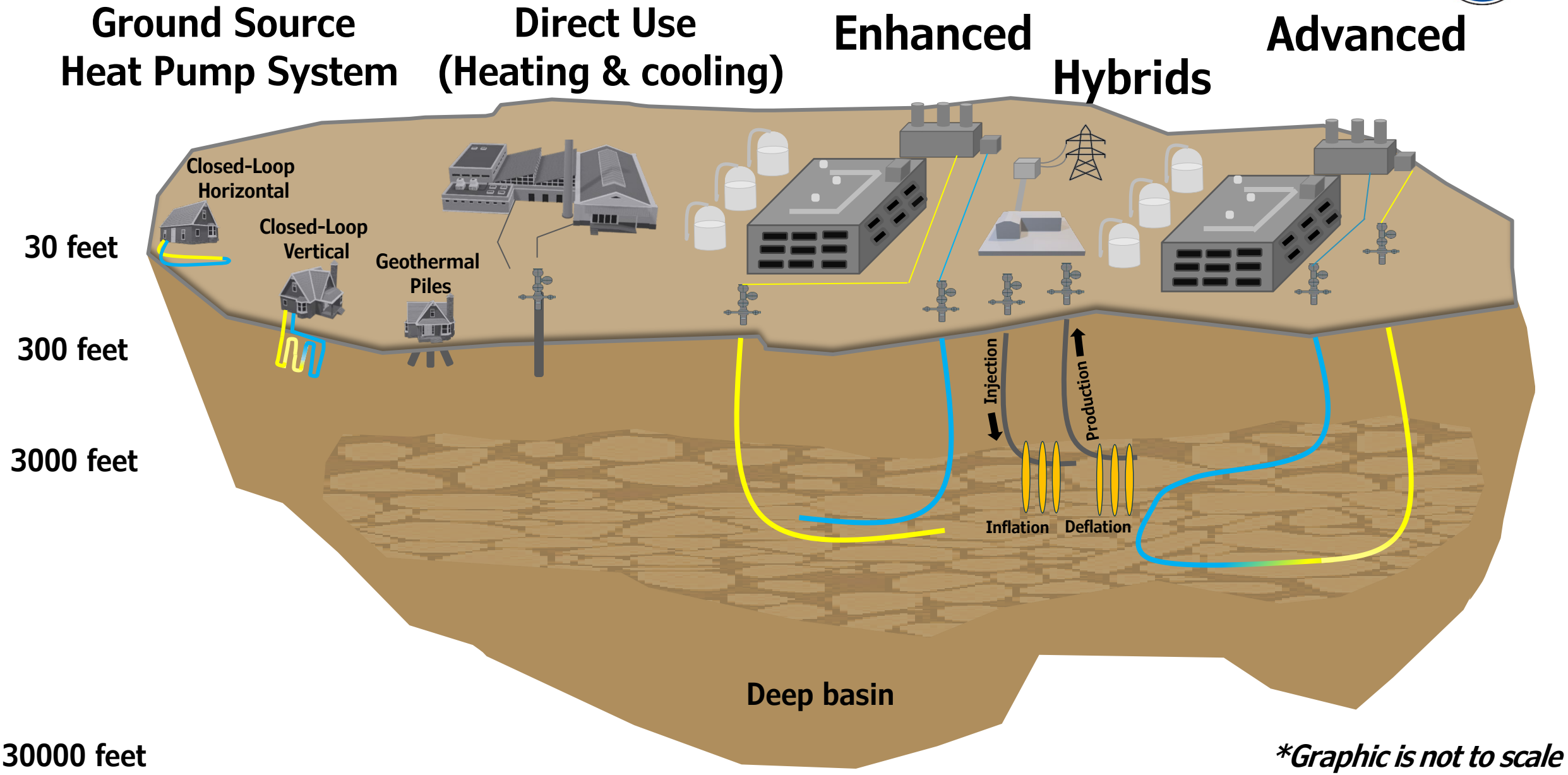
Class V Geothermal Jurisdiction

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

Underground Injection Control (UIC) Classes in Texas

	Class I	Class II	Class III	Class IV	Class V	Class VI
Injection Depth	Thousands of feet below lowermost USDW	Thousands of feet below lowermost USDW	Variable, deep mining formations	At or above USDW	At or above USDW; Can also be deep wells	Thousands of feet below lowermost USDW
Injected Substance	Hazardous & non-hazardous industrial waste	Fluids associated with oil & natural gas production	Fluids for mining	Radioactive waste	Non-hazardous fluids	Carbon Dioxide CO_2
Regulator	TCEQ *	RRC	RRC or TCEQ	Inactive but EPA or TCEQ may authorize	RRC or TCEQ	RRC **
Examples	Petroleum refining; wastewater treatment	Produced water; enhanced recovery	Brine mining (RRC); Uranium and sulfur (TCEQ)	Cleanup operations for the environment	Geothermal and lithium brine (RRC)	Geologic storage of CO_2

Categories of Class V Geothermal Wells



*Graphic is not to scale

Class V Wells (Geothermal) – Who regulates what

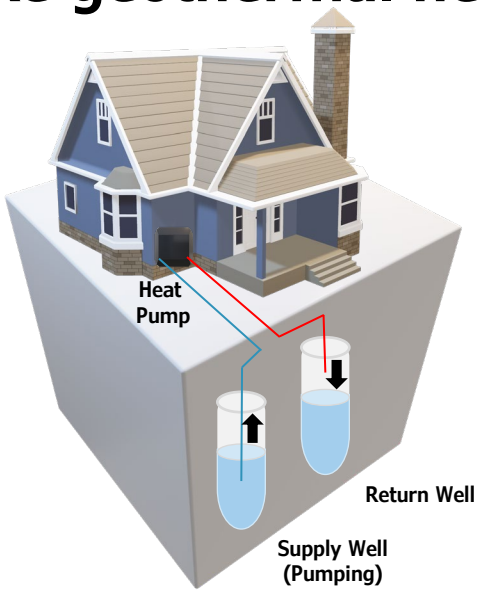
FY25

	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* **Newest 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* **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*

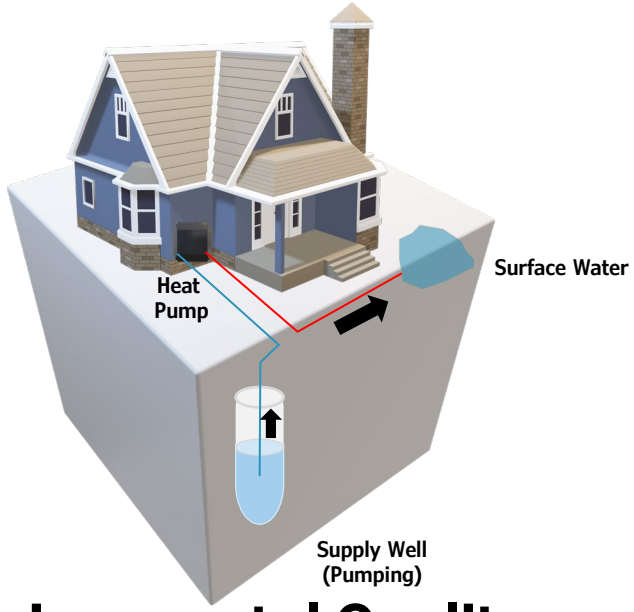
Geothermal Rule – What RRC does not regulate

- **The Chapter 6 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



These systems are regulated by the Texas Commission on Environmental Quality

Class V - Deep Geothermal Systems (Chapter 6 Rule)

- Rule is currently under development
- Covers all facets of geothermal energy and associated resources
- Addresses administrative and technical requirements for various geothermal system designs
  - Advanced Geothermal System (AGS)
  - Enhanced Geothermal System (EGS)
  - Geothermal Geopressured System (GGS)
  - Conventional “Hot Rock” System
  - Hybrid / Other Types of Geothermal Systems
- Rooted in the Underground Injection Control (UIC) Program
- Expect a draft version near the end of 1st Quarter FY26

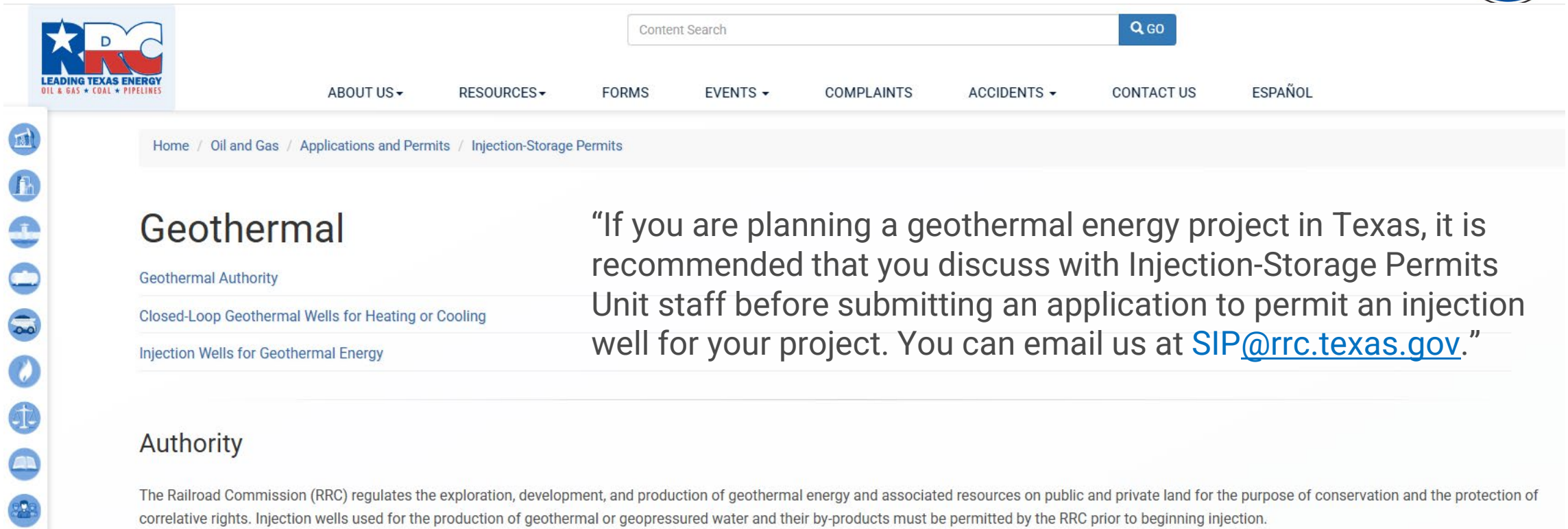
Recent Statutes & Regulations (89th Session)

- **SB 879: Exempts closed-loop geothermal injection well drillers and operators from specific Railroad Commission requirements (specifically a financial bonding requirement)** ✓
- **SB 1762: Outlines that a geothermal energy conservation well is not a battery energy storage resource. Makes geothermal projects eligible for the Texas Energy Fund.** ✓
- **HB 4370: Enables geothermal energy networks in local development districts, creating new opportunities for scalable, community-based geothermal infrastructure** ✓
- **HB 3240: Texas Geothermal Energy Production Policy Council** X

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

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

Summary / Take Aways

- Update on RRC's Geothermal Regulatory Program
- Chapter 6 is the geothermal rule chapter
- Class V Shallow & Deep Geothermal Injection Wells
  - Shallow: Permit-by-rule, no P-5 requirement, no RRC fee
  - Deep: Requires a packet, requires a P-5, requires a fee
- The SIP staff manages geothermal permitting activities
- Expect a draft of the deep geothermal rule by Summer 2026
- RRC Regulatory Conference is July 13-15, 2026

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