Texas Railroad Commission
Underground Injection Control

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February 17, 2020







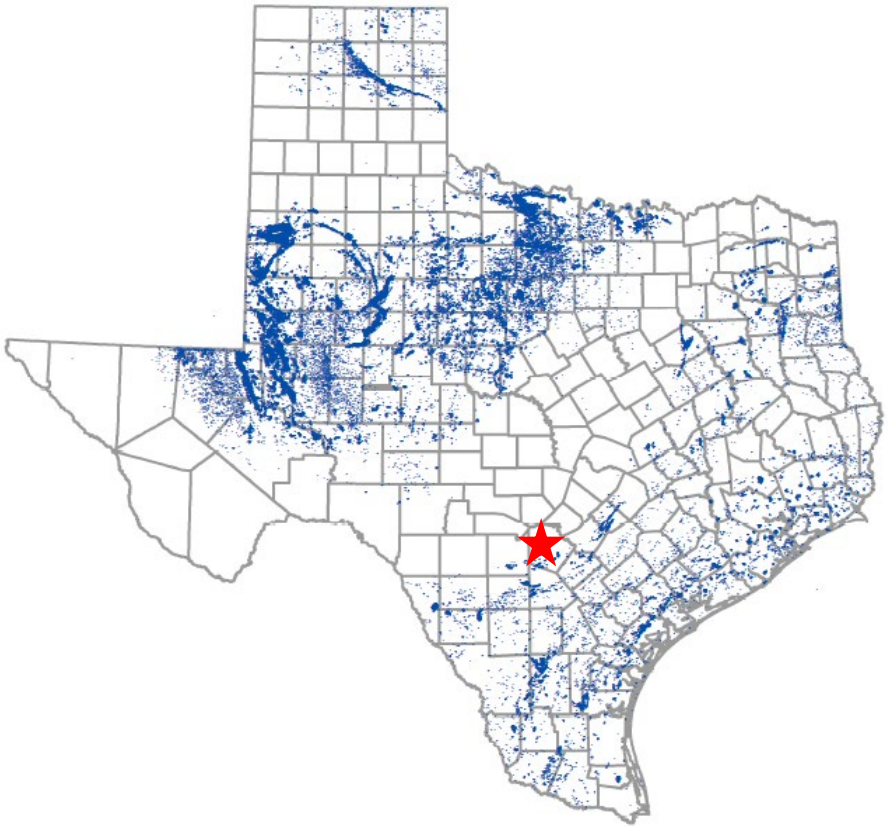


Texas Railroad Commission UIC

- UIC 2019 in Review
- Seismicity and Process
- Systems Modernization and RBDMS
- Texas Water Development Board's Brackish Resources Aquifer Characterization Studies
- Carbon Storage

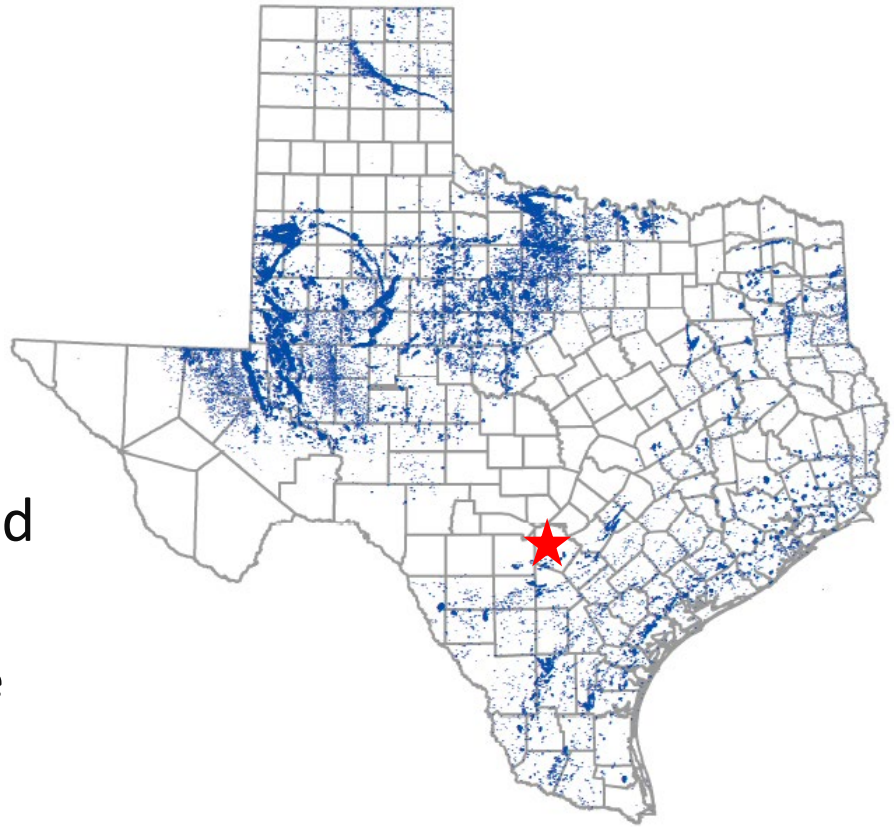
UIC Wells in Texas – Inventory

- 54,754 permitted oil and gas injection and disposal wells
- 32,991 active
- 7,842 disposal wells
- 24,627 enhanced recovery injection wells

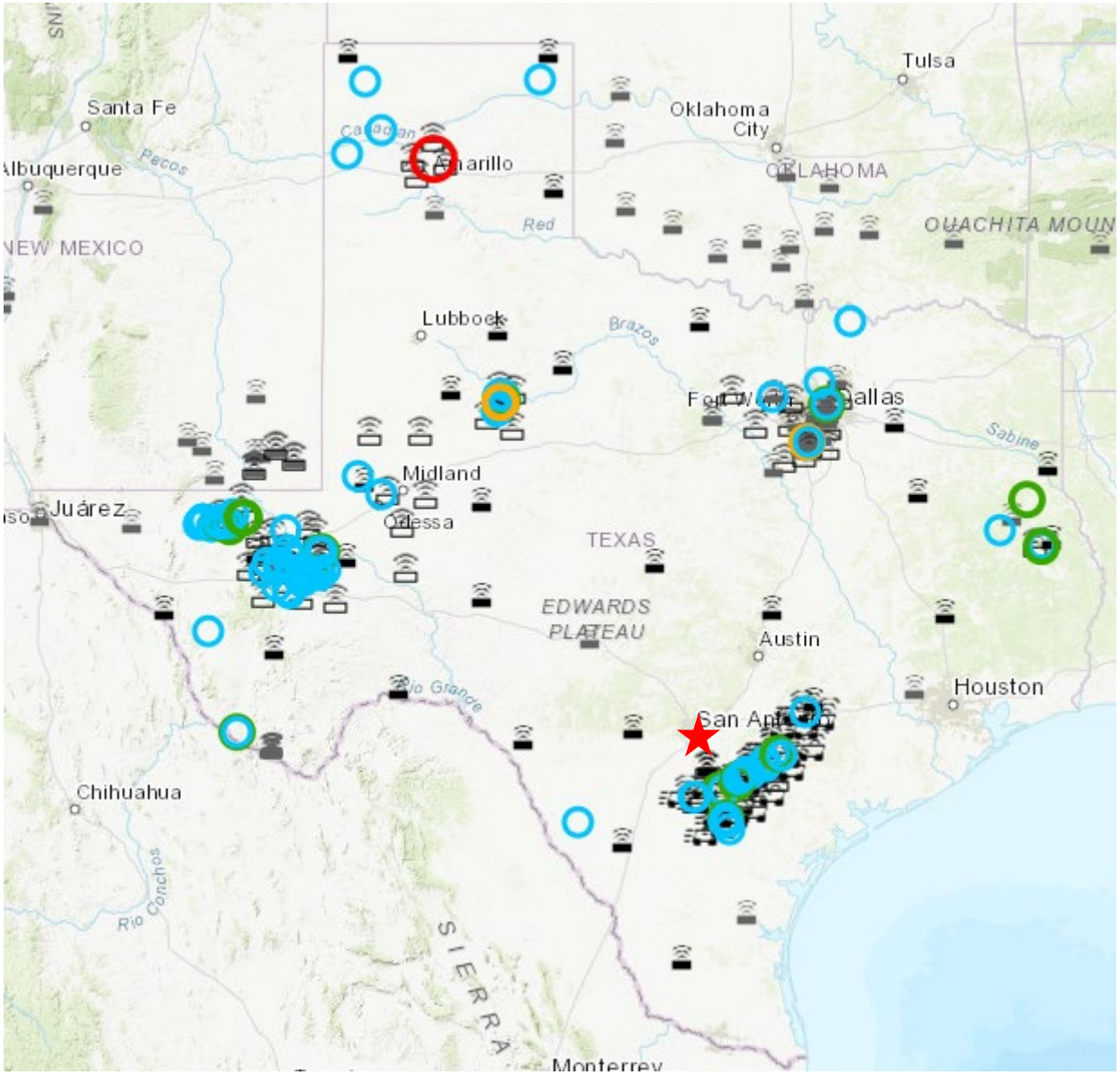


UIC Wells in Texas – 2019 Activity

- Applications Approved
  - 426 Disposal into Non-Productive Formation
  - 1,240 Injection into Productive Formation
  - 27 Brine Mining
  - 31 Storage
- Completions
  - 1,854 Completions Approved
- Well Tests and Reports Reviewed
  - 20,737 Mechanical Integrity Tests
  - 50,870 Annual Volume & Pressure Reports
  - 36 Temperature/Tracer Surveys



Recent Seismicity



TexNet Data
1/1/2017 to 2/16/2020
M > 2.5

Year	Drilling Permits		USGS Earthquakes
	All Wells	Injection Wells	>3.0 M
2012	527	30	0
2013	623	39	0
2014	825	69	0
2015	556	35	3
2016	628	51	5
2017	**1447**	**139**	**14**
2018	1786	122	9
2019	1360	94	4

Disposal Well Seismicity Screen

- Statewide Seismicity Screen
  - See 16 Tex. Admin. Code 9(3)(B) & 46(b)(1)(C).
- An earthquake event of 2.0 M or greater within the area of interest will trigger a seismic review
- USGS & TexNet Data
  - Applicant queries database
  - RRC staff verifies

Seismic Guidelines – Permian Basin

- The seismic review is a scoring system that considers:
  - Earthquake events (TexNet & USGS data)
    - Temporal (how recent and frequent?)
    - Spatial (how close to the proposed well?)
    - Magnitude (how large were the events?)
  - Fault locations and characteristics
    - Public-domain maps
    - Operator data
    - 3-D seismic
  - Depth to basement

Seismic Guidelines – Permian Basin

- The seismic review also considers:
  - Operational Factors
    - Combined Injection Rate into the Zone
    - Nearest Injection into the Zone
  - Reservoir Factors
    - Disposal Zone Static Permeability
    - Disposal Zone Cumulative Thickness
    - Disposal Zone Lithology
- Data Confidence

Permian Basin Permit Conditions

Score A: 30,000 bpd max

Score B: 20,000 bpd max

Score C: 10,000 bpd max

For injection into the Delaware Mountain Group MSIP limited to 0.25 psi/ft to top of disposal interval.

Other pressure testing and monitoring conditions may apply.

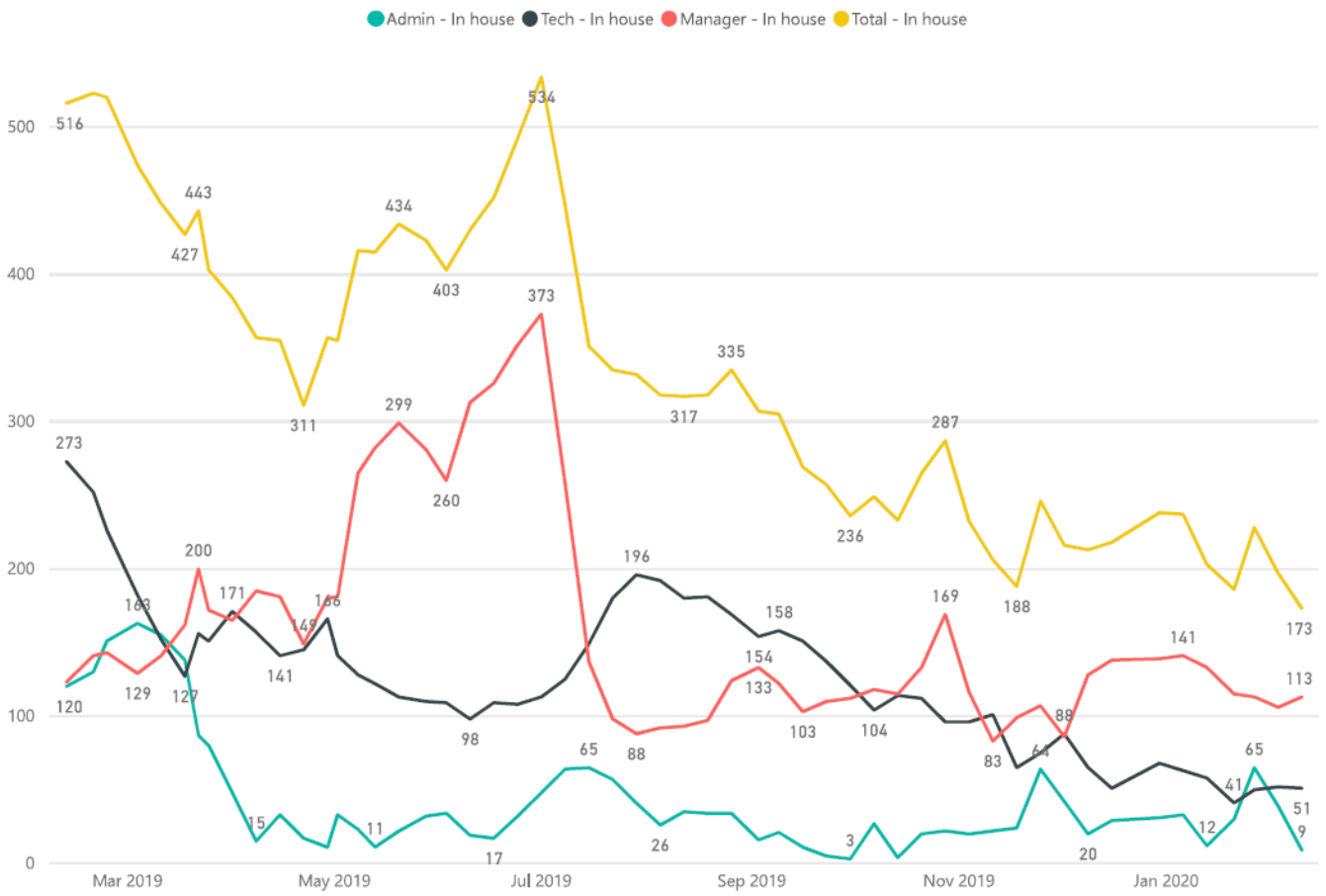
Permian Basin Permit Incentive

Disposal wells scored as “B” or “C” may be authorized to inject an **additional 10,000 bpd**, provided:

- Operator actively implementing a **seismic monitoring plan** that augments the open public data network
- Operator develops and implements a **seismic event response plan** (submitted to RRC)

The purpose of this incentive is to promote public data and research.

Guidelines + Staff + Organization



Now: Getting Off the Mainframe

In this biennium, RRC will establish a new architecture for agency IT offerings, including:

- An enterprise data model/repository to support the agency's business processes,
- A flexible application framework to manage business processes and data,
- Data integration with the new framework,
- Improved reporting capabilities, such as a data warehouse, and
- Identification of obsolete or redundant business processes.

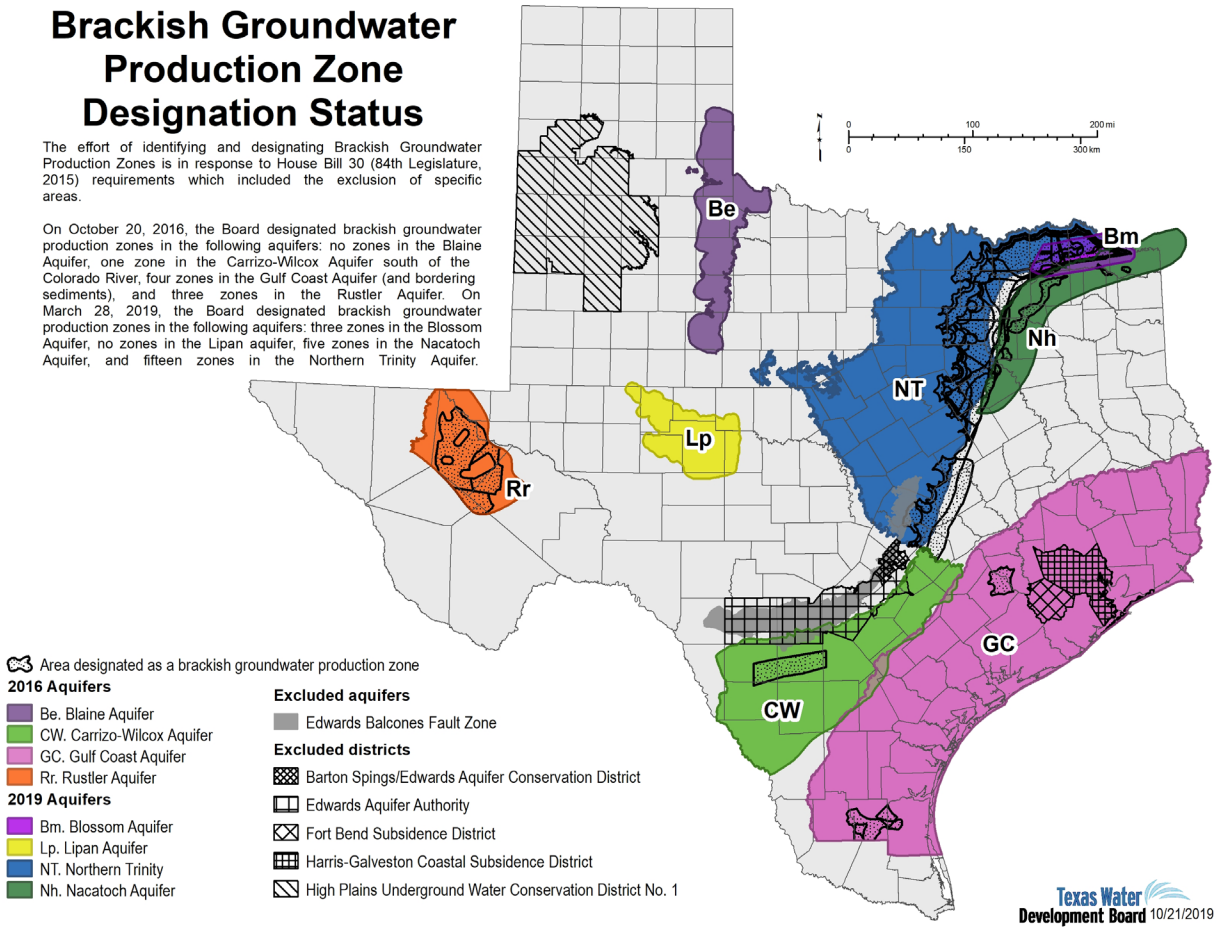
UIC and Mainframe Transformation

GWPC's RBDMS

- Current Online Processes
  - Well Completions
  - Mechanical Integrity Testing (Form H-5)
  - Annual Reporting (Form H-10)
- New Online Processes
  - Permit Applications
  - Systems Integration
  - Automation
- GWPC Seismic App

RRC Coordination with TWDB

In 2015, the 84th Texas Legislature passed House Bill 30, directing the Texas Water Development Board to identify and designate brackish groundwater production zones in the state.



RRC Coordination with TWDB

- RRC provides TWDB with injection well data, GIS data, and access to RRC Well Log Library
- RRC and TWDB staff meet monthly to:
  - Share data (geophysical well logs and water well data)
  - Discuss data interpretation and limitations; as each agency may use the data in a different context
  - Discuss tools and techniques for interpreting data
  - Seek consistency in interpretation of data
- Coordination enhances RRC ability to protect water resources during oil and gas drilling, operation, and plugging, as well as assisting TWDB with the BRACS project

Texas CO_2 Jurisdiction – Geologic Storage

- **Railroad Commission**
  - In reservoirs productive of oil, gas or geothermal resources
  - In reservoirs productive of oil, gas, or geothermal resources in the past, or potentially in the future
  - In saline formations above or below such reservoirs
  - Extraction of anthropogenic CO2
- **Texas Commission on Environmental Quality (TCEQ)**
  - In saline formations other than those under RRC jurisdiction
- **Environmental Protection Agency (EPA)**
  - Class VI (for now)

Texas CO_2 Rules

- **RRC Rules**
  - RRC underground injection rules for enhanced recovery (16 TAC §3.46)
  - 2010: MOU with TCEQ amended
  - 2010: RRC CO2 rules for geologic storage not associated with enhanced recovery adopted
  - 2011: RRC CO2 rules for geologic storage associated with enhanced recovery adopted

RRC CO_2 Storage Regulations

- **Chapter 5 Carbon Dioxide**
  - Subchapter A –General Provisions
  - Subchapter B –Geologic Storage and Associated Injection of Anthropogenic CO2 (Non-EOR)
  - Subchapter C -Certification of Geologic Storage of Anthropogenic CO2 Incidental to Enhanced Recovery of Oil, Gas, or Geothermal Resources (EOR)

Thank you

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