



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 6  
1201 ELM STREET, SUITE 500  
DALLAS, TEXAS 75270

May 26, 2021

Danny Sorrells, Director  
Oil and Gas Division  
Railroad Commission of Texas  
P.O. Box 12967  
Austin, TX 78711-2967

Dear Mr. Sorrells:

This letter transmits EPA's end-of-year evaluation (EOY) of the Texas Underground Injection Control(UIC) program implemented by the Railroad Commission of Texas (RRC) for State Fiscal Year 2020.

The Railroad Commission continues to confront significant challenges in the program and has taken some innovative measures to address them in a year complicated by the Covid pandemic. We wish to thank you and your staff for your work in protecting underground sources of drinking water from underground injection activities under your authority. We appreciate the continued attention to issues related to permitting disposal wells in seismically active areas of the Permian Basin and the continued attention on problematic areas in East Texas resulting in a consistent system for evaluating seismic hazards near disposal wells and application of appropriate permitting conditions. We also note your efforts toward continued improvement of data reporting and recordkeeping at the Commission. An increased focus on Class VI Geosequestration and Carbon Capture projects will put additional burdens on the RRC in the future and EPA suggests close collaboration between our staffs as the Commission pursues primacy for Class VI well permitting.

We thank you and your staff for your efforts in the implementation of this challenging program. If you wish to discuss any aspect of this EOY evaluation, please call me at (214) 665-7101, or you or your staff may contact Mr. James R. Brown at (214) 665-3175. If your staff have specific questions about UIC grant performance, please contact Mr. Michael Vaughan at (214) 665-7313 or Mr. Arnold Bierschenk at (214) 665-7435 for questions regarding EPA's program oversight.

Sincerely,

A handwritten signature in black ink, appearing to read "Charles W. Maguire".

Charles W. Maguire  
Director  
Water Division

Enclosure

cc: Paul Dubois, Assistant Director, Technical Permitting, w/encl.  
Sean Avitt, RRC UIC Manager, w/encl.

**FISCAL  
YEAR  
2020**

**EPA REGION 6 END-OF-YEAR  
EVALUATION RAILROAD COMMISSION  
OF TEXAS UNDERGROUND INJECTION  
CONTROL PROGRAM**

**Introduction**

Under Safe Drinking Water Act (SDWA) Section 1425 authority, EPA approved the Railroad Commission of Texas (RRC) Underground Injection Control (UIC) primacy enforcement responsibility for Class II oil and gas related injection wells in 1982. EPA later approved RRC's primacy UIC program for Class III brine mining wells and energy related Class V injection wells under SDWA Section 1422.

As part of the EPA/RRC primacy agreements, EPA Region 6 retains oversight responsibilities that includes an annual end-of-year evaluation. This annual oversight report summarizes RRC activities during State Fiscal Year (FY) 2020 in fulfillment of its primacy program and Federal UIC grant and workplan commitments. The Texas State Fiscal Year begins on September 1 and ends on August 31 each year.

**FY2020 Grant Application/Workplan**

Pursuant to receiving federal financial assistance through SDWA Part C authorization, the RRC submits and EPA approves an annual grant application and associated workplan that outlines goals, expected milestones for key program activities, and estimated funding toward achieving those goals and milestones. The grant application for FY2020 was approved by Region 6 on 6/27/2019. And, the FY2019 workplan was approved by Region 6 on 6/18/2019.

**FY2020 Grant Award and Allocation**

The federal FY2020 grant allotment for the Texas Railroad Commission's (RRC) UIC program was \$630,360 in UIC programmatic funds; these funds are determined annually based on the annual well inventory numbers submitted by State UIC Primacy programs upon EPA request near the end of each calendar year. There were TX RRC UIC Special Project funds awarded in FY2020, but none of these UIC Special Project funds were spent in FY2020. So, this TX RRC UIC Special Project money was moved over into the FY2021 grant.

**Grant Deliverables**

Pursuant to EPA regulations and policies, environmental programs conducted on behalf of EPA will establish and implement effective quality systems. Correspondingly, the State program's Quality Management Plan (QMP) and Quality Assurance Project Plan (QAPP) must be validated annually. If both the QMP and QAPP are current and valid, EPA requires each state to certify annually that both plans are current by submitting updated signatory pages and organizational charts as applicable. The FY2020 QMP [QTRAK #20-067] was approved by Region 6 on December 6<sup>th</sup>, 2019 and expired on December 6<sup>th</sup>, 2020. The FY2020 UIC QAPP [QTRAK #20-070] was

approved by Region 6 on December 16<sup>th</sup>, 2019 and expired on December 16<sup>th</sup>, 2020. The FY2021 QMP [QTRAK #21-067] was approved by Region 6 on December 2<sup>nd</sup>, 2020 and expires on December 2<sup>nd</sup>, 2021 The FY2021 UIC QAPP [QTRAK #21-070] was approved by Region 6 on December 16<sup>th</sup>, 2020 and expires on December 16<sup>th</sup>, 2021. Table 1 includes the workplan due dates and date of receipt for documents submitted by RRC as specified in the grant workplan.

**Table 1. Grant deliverables in FY2020 UIC Workplan.**

<b>Grant Deliverable</b>	<b>Due Date</b>	<b>Date Received</b>
Quarterly Reports (EPA Forms 7520)	4/30/2020 10/31/2020	Submitted on time
FY2020 Grant Application  FY2020 Grant Workplan	The application/workplan were both due on 5/31/2019	Application received- 5/29/2019 Approved – 6/27/2019  Workplan received- 5/29/2019 Approved – 6/18/2019
Final Financial Status Report (FY20)	11/30/2020	11/06/2020
Annual UIC Program Report (FY2020)	09/30/2020	10/01/2020
Update on Program, Regulatory or Statutory Changes	09/30/2020	10/01/2020

	<b>Table 1. Grant deliverables in FY2020 UIC Workplan (cont)</b>	
	FY2020 QMP: 12/31/2019	Received- 12/03/2019 Approved- 12/06/2019 Expires- 12/06/2020
	FY2020 QAPP: 12/31/2019	Received- 12/03/2019 Approved-12/16/2019 Expires- 12/16/2020
FY2020 & FY2021 Annual QMP/QAPP Updates*	FY2021 QMP: 12/06/2020	Received- 11/18/2020 Approved- 12/02/2020 Expires- 12/02/2021
	FY2021 QAPP: 12/16/2020	Received- 11/02/2020 Approved-12/16/2020 Expires- 12/16/2021
UIC Well Inventory for FY20	1/01/2021	Submitted – 12/18/2020 Finalized - 2/26/2021

\* The Quality Management Plan (QMP) and Quality Assurance Project Plan (QAPP) are updated annually.

## **FY2020 Covid 19 Adjustments to Operation**

On March 13, 2020, the Governor of Texas declared a state of disaster for the State of Texas due to the COVID-19 epidemic. Subsequently, the Commission allowed oil and gas operators to request waivers to regulatory requirements and extended deadlines for certain expirations and filing requirements through September 30, 2020. Waivers and extensions did not apply to any rules regulating public safety, health, or the prevention of pollution.

On May 5, 2020, the Commission issued a temporary order to allow a permit to be granted for storage of crude oil in geologic formations other than salt formations by exception to Statewide Rule 95. No permits were issued to store crude oil in a formation other than salt in FY2020.

## **Inventory**

The State UIC program annual inventory numbers are usually submitted during or near December each year. These values (along with values reported by other State and EPA UIC programs) are used by EPA to calculate the annual grant funds allocated to each State UIC program.

Since inception, the RRC UIC program remains the nation's largest Class II program by far based on the total number of Class II injection wells reported annually. Injection wells used in natural gas storage operations are also regulated by the RRC but are specifically excluded from regulation under the SDWA and not subject to EPA UIC oversight.

At the end of FY2020, the Commission's inventory of UIC wells was 54,247, a decrease of approximately 1.9% from the previous year's total of 55,313. The Commission processed 53,356 annual reporting forms (Form H-10) for disposal/injection wells and 891 annual reporting forms (Form H-10H) for hydrocarbon storage and brine mining wells as show in the table below.

<b>UIC Class</b>	<b>Wells Permitted</b>	<b>% of Total</b>
IIR – Secondary Recovery / EOR	39,175	72%
IID - Disposal	14,181	26%
IIH – Liquid Hydrocarbon Storage	681	1%
III – Brine Mining	210	<1%
<b>Total</b>	<b>54,247</b>	

## **Key Program Activities**

This section includes an evaluation of key program measures as reported annually to EPA by the RRC through EPA's Forms 7520 and the annual narrative required in the annual UIC grant workplan.

### **Permitting**

All injections wells authorized by the RRC are authorized through RRC permits. There are no authorized-by-rule injection wells regulated by the RRC.

In FY 2020, the Commission received 1,663 applications for 1,789 disposal and injection wells and issued 1,315

permits for 1,493 wells. The Commission transmitted 377 applications to Docket Services for resolution through a hearing.

In FY 2020, the Commission received 25 applications for 28 brine-mining wells and issued 14 new permits for 14 wells. The Commission received no new applications and five expansion applications for underground hydrocarbon storage. The Commission amended permits for 34 underground hydrocarbon storage wells and issued permits for 15 new underground hydrocarbon storage wells. The Commission received three new applications and no amended applications for salt cavern disposal wells in FY 2020. Additionally, the Commission issued no new permits for caprock injection

The East Texas Field is the only area in Texas for which operators have been granted an exception to the Area of Review (AOR) requirements of Statewide Rule 46. In FY2020, the Commission permitted one new and three amended noncommercial injection wells in the East Texas field.

## **Class II Injection Well Completions, Mechanical Integrity Testing, Reporting, Inspections, and Enforcement**

### **Well Completions**

In FY 2020, the Commission's online system for filing and processing Completion Reports for Oil, Gas, and Injection wells (Forms W-2/G-1) tracked approximately 2,021 completion packets for injection/disposal wells, each of which was reviewed for compliance with the permit.

### **Mechanical Integrity Test (MIT)**

One of the most important indicators of ground water protection in any UIC program is the mechanical integrity testing program, or MIT. A properly conducted MIT evaluates the condition of the well casing, tubing, and packer to assure acceptable operating conditions. In most cases, an MIT is a pressure test of the casing/tubing annulus and the associated packer; a test failure may indicate a pathway for injected fluid to move out of the well into an underground source of drinking water. This procedure is required at least every five years for Class II wells; in some cases, more frequent testing is required depending on the completion and age of the well.

In FY 2020, the Commission received and reviewed 12,056 reports for MIT pressure tests of disposal and injection wells. The Commission's district office inspectors witnessed 5,022 (41.65%) of MITs performed by operators on permitted UIC wells. The Commission approved tubing-casing annulus credit (TCAM) in lieu of mechanical integrity testing for 18 wells per 16 TAC §3.9 (12) (E) alternative testing methods. Each well was inspected to verify credible wellhead monitoring.

In FY 2020, in lieu of pressure tests, the operators of one injection and disposal well performed and reported the results of one radioactive tracer survey and no temperature surveys. Operators also performed mechanical integrity tests on 109 hydrocarbon storage wells and 78 brine-mining wells.

### **Annual Reports**

The Commission processed 50,642 annual reporting forms (Form H-10) for disposal/injection wells and 765 annual reporting forms (Form H-10H) for hydrocarbon storage and brine mining wells.

The Commission's Form H-10 online filing system has continued to increase the availability of information relating to injection and disposal volumes for public, as well as internal queries. This system also continues to increase the number of annual compliance reviews.

### **Inspections**

The Commission's district offices reported 20,204 routine inspections of injection, disposal, and storage wells

in FY 2020. This represents approximately 39% of UIC wells that submitted an annual report were inspected this fiscal year. The district offices continue to maintain a high level of activity in support of the UIC program.

### Enforcement

As part of their UIC surveillance, the RRC requires operators of injection wells to complete and submit Form H-10 annually; Form H-10 includes specific well identification information and monthly measurements of injection pressures, injected volumes, and casing/tubing annulus pressures.

In FY 2020, the Commission took a total of 12,051 enforcement actions against operators of disposal and injection wells. Of these actions, 1,956 were notices of violation for failure to timely file the annual reporting forms and 3,690 were notices of violation for failure to conduct a pressure test within the time-period required by the Commission. The Commission issued seal orders for 115 disposal and injection wells and severed pipeline connections on 772 wells/leases due to delinquent annual reporting forms and failure to conduct required MITs.

In FY 2020, the H-10 online system initiated the review of reports and issued 629 notice of violation letters, representing 1,816 violations for 1,248 wells. Of those violations, 410 notice of operating violations were for excessive pressure and volume or injecting out of zone. The Commission issued 40 seal/pipeline severance orders when operators failed to comply with H-10 online system notices of violation.

In FY 2020, the Commission issued 1,274 seal orders and pipeline severances for violations associated with the UIC program resulting in \$955,500 lease reconnection fees. The Commission signed 18 consent agreements and administrative orders for enforcement actions associated with the UIC program. Enforcement actions resulted in penalties of \$532,939 violations associated with the UIC program.

Based on the information provided by the RRC, EPA Region 6 believes the State UIC program compliance surveillance and enforcement program for Class II and III injection wells regulated by the RRC appears effective. Even in a pandemic year with lessened travel and contact, a large percentage of the authorized injection wells in Texas were inspected in FY2020 and the RRC also collected and reviewed operator-submitted monitoring information from a large percentage of the Class II well inventory. Those numbers assure more than adequate inspection and monitoring surveillance actions.

A summary of focused oversight matters makes up the remainder of this evaluation.

### Current Oversight Issues

In previous program evaluations EPA Region 6 has focused on various UIC program concerns which continue to warrant attention. These include:

Apparent formation pressure increases in East Texas, Fort Worth Basin, and other areas, associated with authorized Class II disposal, and

Increased seismic activity related to authorized Class II disposal.

### East Texas Field

Commercial disposal wells in East Texas Field are subject to the AOR requirement and special permit conditions that include open-hole logs to verify formation tops, cement bond logs to confirm formation isolation, and radioactive tracer surveys to ensure confinement. Many logs and surveys are witnessed by district office staff. In FY 2020, the Commission permitted two new and no amended commercial disposal wells in the East Texas field.

### Fort Worth Basin

The Commission imposes additional permitting criteria and conditions for disposal wells in the Fort Worth Basin. The Commission expanded the AOR for these wells to an area of ½-mile radius. In addition, permit applicants for commercial disposal wells or for lease disposal wells proposing to inject over 5,000 barrels per day into formations above the Barnett Shale Formation in the Barnett Shale trend area are required to provide pressure influence information demonstrating that the injected fluids will be confined to the injection interval. In FY 2020, the Commission received two applications for injection above the Ellenburger Formation. Permitted injection below the Barnett Shale Formation into the Ellenburger Formation must be at least 250 feet below the top of the Ellenburger Formation and is restricted to a maximum of 25,000 barrels per day. In FY 2020, the Commission received no new permit applications for injection into the Ellenburger Formation in the Barnett Shale trend area.

### Panhandle

The Commission imposes special conditions requiring bottomhole pressure (BHP) measurements for wells injecting into portions of the Brown Dolomite in the Texas Panhandle region. These wells are also subject to annual mechanical integrity testing. The EPA commends RRC communication with Oklahoma regulatory agencies on this ongoing issue.

### Harrison, Panola, and Shelby Counties

The Commission continues to study certain areas where formation pressures are elevated. The Commission continued its study of the effects of the increase in disposal well operations in the Rodessa and other formations in Harrison, Panola, and Shelby Counties of Texas related to the development of the Haynesville Shale. In January of FY 2018, the Commission provided the Final Report for the East Texas Formation Pressure Project with EPA's funding assistance. The Joaquin area of northeast Shelby County was studied in detail in conjunction with staff from EPA and Louisiana Department of Natural Resources. A geologic boundary two miles south of Joaquin was identified between an area of elevated pressure and an area of lower pressure. This study is ongoing. The Commission continues to monitor the formation pressures in the Pergan-Marshall area in Harrison County. Annual bottomhole pressure testing three miles northwest of that area shows normal pressure, and the area 10-13 miles southeast shows elevated pressures. EPA commends the RRC for continued collaboration and information sharing with the Louisiana Department of Natural Resources on near border issues related to pressure conditions in this area.

In FY 2020, the Commission received the results of bottomhole pressure tests from wells in Harrison, Panola, and Shelby counties from the operators of 21 wells. In FY 2020, the Commission issued, in these counties, 10 new permits and 10 amended permits. Of those, one new permit was granted after hearing and no amended permits were granted after hearing, all with a special condition to measure bottomhole pressure. In FY 2020, the Commission denied one application for a new permit based on the results of previous formation pressure mapping.

### Seismicity

Effective November of 2014, the Commission's Statewide Rules 9 and 46 were amended to require operators to provide information from the United States Geological Survey (USGS) regarding the locations of any historical seismic events within a circular area of 100 square miles centered around a proposed disposal well location. This requirement applies to all new disposal wells and similar amendment applications where pressure, volume, or interval changes are requested. During FY 2019, the Commission Seismologist and UIC staff produced a guidance document (SOG), titled "Permitting Salt Water Disposal Wells in Seismically-Active Areas of the Permian Basin". The SOG provided UIC staff with a consistent system for evaluating seismic hazard near a disposal well and appropriate permitting conditions. The SOG has increased disposal well permit application review confidence and productivity in areas prone to seismic activity. EPA commends the RRC for an increased focus on the issue of seismicity in the Permian basin and the new seismicity procedures, internal guidance, and permitting actions discussed above.

For FY 2020, the Commission initiated a seismicity review for 173 disposal well applications. Of those applications, 21 applications remain pending. The Commission issued 6 permits without special conditions and 200 permits with special conditions to mitigate risk of seismic activity. Many of the special conditions would require reduced volume and reduced pressure and may include keeping daily injection volume and pressure records, a bottom-hole pressure test and a step-rate test and could require seismic monitoring. The applicant withdrew or the Commission returned 47 applications. UIC staff transmitted 135 applications to Docket Services for a hearing.

On March 26, 2020, an earthquake occurred approximately 27.5 miles east of Mentone, Texas, that was recorded by USGS as 5.0M and 4.6M by TexNet at the Bureau of Economic Geology. There are oil and gas activities in the vicinity of the earthquake, and UIC staff are investigating whether saltwater disposal wells (SWDs) may have contributed to the seismic activity. The RRC requested SWD operators to reduce injection rates and pressures and requested information like daily injection rates and pressures and hydraulic fracturing stimulation locations and times, from operators with wells in the vicinity to fully evaluate the link to disposal activities. EPA commends the communication with our Region 6 staff in response to this event.

## **Special Projects**

EPA has previously awarded special grant funds to the Commission to improve data quality and availability.

### **Special Grants**

EPA awarded special grant funds to the Commission to scan underground hydrocarbon storage files, including permit applications, MITs, and sonar reports, and injection/disposal well MITs. These projects were delayed due to COVID-19 and lockdown conditions for much of the year but should begin in FY 2021.

### **IT Infrastructure and Data**

The Commission was funded to build new and modify existing information technology systems for FY 2020 and awarded the contract to the Groundwater Protection Council (GWPC). The Commission completed a fit-gap analysis and began development of Release 1 of a new system, which included the new system's infrastructure and oil and gas operator Organization Reports (Form P-5). When fully funded, the new system will completely replace the Commission's mainframe data system over approximately five years and enable more accurate reporting. The Commission added staff in FY 2020 to ensure safety, protection of groundwater, and productivity during the transition to this new system.

The Commission deployed the new online H-5 system for submission of MIT data and results in February 2020. This new system helps reduce paper and cost required for UIC compliance and increases data fidelity. The Commission continues to make wise use of provided special funds to enhance data usability and visibility to the public.

The Commission and EPA headquarters have worked together to get Texas' mapped aquifer exemptions in the EPA's Interactive Aquifer Exemptions Map. The GIS dataset was delivered in late FY 2019. The EPA deployed the new Interactive Aquifer Exemptions Map, including the Commission's data, in Spring 2020. EPA commends RRC for this resource intensive effort and found no significant issues regarding possible contamination of USDWs. Region 6 appreciates the communication on historical aquifer exemptions and the renewed focus of the RRC on awareness when processing new permits.

## **Summary**

The Railroad Commission continues to confront significant challenges in the program and has taken some innovative measures to address them in a year complicated by the Covid pandemic. Emergent issues such as increasing West Texas seismicity and ongoing issues such as areas of significant pressure buildup have increased the complication in management of workplan commitments, but the Commission is to be congratulated on their efforts implementing such a large national program and wisely using their available resources. EPA continues to have concern over the vulnerability of underground sources of drinking water (USDWs) in areas of over-pressured injection formations in East Texas and increasing seismicity in portions of West Texas. There are also concerns regarding operator proposals of Class II H<sub>2</sub>S wells being utilized as Class VI CO<sub>2</sub> disposal repositories. EPA is appreciative that the Railroad Commission continues to actively participate in activities concerning UIC and other groundwater protection issues that involve activities external to the Commission, including the Texas Groundwater Protection Committee (TGPC), the Interstate Oil and Gas Compact Commission (IOGCC), and the Groundwater Protection Council (GWPC). UIC staff has assisted Texas Water Development Board staff on their evaluation of Texas aquifers for brackish water production in areas of injection and EPA will be mindful of the outcome of those studies as they relate to aquifer exemptions and other related UIC issues. An increased focus on Class VI Geosequestration and Carbon Capture projects will put an additional burden on RRC staff in the future, and EPA suggests the RRC explore ways to augment staff numbers and capabilities to deal with what is likely to be a substantial increase in workload when the Commission pursues primacy for Class VI well permitting.