

Texas Aquifer Exemptions: *Ignoring Federal Law to Fast Track Oil & Gas Drilling*

The Railroad Commission of Texas has failed to implement Safe Drinking Water Act protections and allowed injection activity into underground sources of drinking water — removing them from future supplies at a time of rapid population growth and recurrent drought. The Commission has deemed federal regulations for aquifer exemptions “inapplicable” to Texas oil and gas operations, despite agreeing, in 1982, to federal oversight of aquifer exemptions in a Memorandum of Agreement with EPA.

Producing oil fields were given blanket approvals to inject fluids into potential drinking water sources regardless of water quality in 1982, yet a map or list of these areas was never released. Over the last 30 years of underground injection activity, no subsequent applications for aquifer exemptions were ever filed. This disregard for federal requirements has led to decades of confusion, potential illegal injection and increased risk to drinking water. The Railroad Commission effectively prioritized the concerns of the oil and gas industry over the long term drinking water needs of Texas residents.



What are Aquifer Exemptions?

Underground sources of drinking water (USDW) are federally-protected by the Safe Drinking Water Act’s (SDWA) Underground Injection Control (UIC) program. However, a little known aspect of the program allows certain oil and gas and mining activity to occur in groundwater that would otherwise be protected as a drinking water source. This is an aquifer exemption.

EPA developed the aquifer exemption program in the 1980’s when oil and gas interests argued that certain oil and gas development would not be possible if every underground source of drinking water were protected. Groundwater containing less than 10,000 mg/l total dissolved solids (TDS) is considered a USDW, unless EPA grants an aquifer exemption which removes protections and allows injection activity.

In this way, aquifer exemptions essentially “write off” underground sources of drinking water to allow for oil and gas and mining activity to occur. Oil and gas companies use aquifer exemptions for two primary purposes: to inject wastewater underground for permanent disposal, or to inject water, steam, chemicals and other fluids for enhanced recovery (ER).

RE: Open Records Request

Mr. Foster:

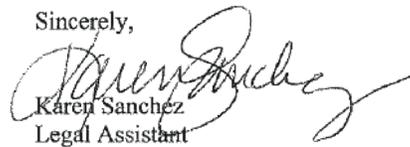
Enclosed is a CD with the Class II injection well information. This database does not include lease owner, as we do not have the information, or Total Dissolved Solids, as we do not track that information. You will need to contact our Digital Section to purchase the latitude and longitude data. You will be able to match up the data on the CD with the data on the locations. Please contact Ernest Ovideo at 512-463-7254.

We have never received any aquifer exemption requests so we have no records of correspondence related.

Enclosed are three letters between the Commission of the EPA regarding the last part of your request.

If you have any questions, don't hesitate to contact me.

Sincerely,



Karen Sanchez
Legal Assistant
General Counsel

Figure 1. Letter from Railroad Commission to Clean Water Action, June 23, 2016

Railroad Commission Does Not Have a Complete Idea of Which Aquifers are Exempt

Injection wells used for oil and gas operations are regulated under Class II injection wells of the UIC program. Texas has 54,811 Class II injection wells, the most of any state in the nation.¹ These are wells used for oil and gas wastewater disposal and enhanced recovery. Surprisingly for a state with this many injection wells, Texas has never reviewed any aquifer exemption applications. [See Figure 1.] In practice this would mean that the Railroad Commission has never permitted an injection well into an aquifer containing less than 10,000 mg/l TDS. While possible, Clean Water Action is skeptical of this conclusion due the vast number of injection wells in Texas, and the relatively common occurrence of injection into relatively high quality aquifers in other states.

Through Freedom of Information Act (FOIA) requests to U.S. EPA and the Railroad Commission, Clean Water Action uncovered a potential multi-decade long pattern in which the Railroad Commission ignored federal requirements to ensure protection of USDWs. Over time the Railroad Commission normalized operating procedures which skirted

federal oversight of this issue, potentially leading to illegally permitted injection wells and drinking water sources destroyed.

Railroad Commission UIC Oversight Responsibilities

The 1974 Safe Drinking Water Act authorized the U.S. EPA to develop a program to protect USDWs from the injection of fluids underground. EPA's Underground Injection Control (UIC) regulations set federal minimum protections around USDWs. In 1982, Texas applied for and was granted primary management and oversight authority over its UIC Class II program. In practice this meant that Texas gained the authority to regulate oil and gas injection activity with the understanding that its state regulations demonstrated an "effective" program for protecting USDWs from contamination.² At the time of this primacy agreement in 1982, EPA and the Railroad Commission agreed that all currently producing oil fields would be given blanket aquifer exemptions. Also, primacy agreement correspondence stated, "Aquifer exemptions would not be granted without EPA concurrence."³ This requirement that EPA grant aquifer exemptions is consistent with federal regulations.⁴

In an effort to clarify in which areas the Commission will authorize injection provided other freshwater zones are protected, maps will be furnished to EPA of productive fields within the State of Texas. If the water in productive zones is 10,000 TDS or less (EPA aquifer designation), injection into these productive zones will be authorized provided other zones are protected (EPA aquifer exemption). If the water is more than 10,000 TDS, injection may also be authorized since the water is of poor quality.

Since the State of Texas has been mapped on the basis of 3,000 TDS water rather than 10,000 TDS, overlays are not available so that EPA could compare the two maps and know exactly which of these productive zones is an "exempted aquifer". If the maps were available it would only help EPA distinguish between zones exempted as productive, and zones with water above 10,000 TDS. This distinction is of no value, since in neither case will the zone be treated as a drinking water source which must be protected.

Figure 2. Railroad Commission to EPA Region 6, March 21, 1982

Correspondence between Railroad Commission and U.S. EPA confirmed that the Railroad Commission agreed to provide maps of producing oil fields that were exempt. It also showed the Commission did not have a complete understanding of whether these fields contained USDWs, nor was it concerned with determining this information for EPA. [See Figure 2.]

It remains unclear whether EPA Region 6 or the Railroad Commission has a list of oil fields that were considered exempt. Clean Water Action asked for this information to be made public over the past year with no results.⁵

The lack of an original list of aquifer exemptions is problematic for two reasons. First, without the necessary list from 1982 there is no way to decipher which wells were permitted to inject into exempted aquifers. Second, there is no way to prove that subsequent injection wells were permitted outside the boundaries of the original oil fields did not need an aquifer exemption.

The terms outlined in an EPA letter to the Railroad Commission [See Figure 3.] which finalized Texas aquifer exemptions as of 1982 and approved a process for future exemptions presents serious concerns. The Railroad

Commission has never released an original map and a list of producing zones that were exempt. Additionally, the Railroad Commission has never submitted

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any expansion notices for these producing zones that might require an extension of an aquifer exemption to EPA. [See Figure 3.] This is because the Railroad Commission did not subject any subsequent injection wells to the full federal criteria for protecting USDWs. As

a result, there is no way to know if the original fields expanded into areas which contained sources of drinking water which could have been used in the future. Instead oil fields were expanded from their original boundaries without required scrutiny and injection activity was permitted regardless of water quality.

Lastly, the terms concluded that the Railroad Commission would submit aquifer exemptions for

new producing fields (those discovered after 1982), or for non-producing zones (used primarily for wastewater disposal) to EPA for final approval. The Railroad Commission did not follow this agreement.

These actions have misled the public and demonstrated a disregard for the federal requirements granted under the SDWA.

In 2014, it was revealed that similar confusion over the original list of exempted aquifers in 1983, combined with inadequacies in its UIC permit review process led California's Division of Oil, Gas and Geothermal Resources (DOGGR) to improperly permit thousands of wells to illegally inject into potential sources of drinking water. DOGGR has since begun to overhaul its UIC class II program, shutting dozens of wells and initiating rulemakings to ensure protection of USDWs.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
 REGION VI
 1201 ELM STREET
 DALLAS, TEXAS 75270

M.K.C. OF TEXAS
 APR 1 1982
 O.G. - UIC
 DALLAS, TEXAS

March 29, 1982

Jerry Mullican
 Director of Underground Injection Control
 Texas Railroad Commission
 Oil and Gas Division
 P. O. Drawer 12967, Capitol Station
 Austin, Texas 78711

Dear Mr. Mullican:

Thank you for meeting with the Environmental Protection Agency (EPA) Headquarters and Regional staff in Washington, D.C. on March 26, 1982, to discuss the Texas Railroad Commission's (TRC) application for the Underground Injection Control (UIC) program under section 1425 of the Safe Drinking Water Act. As a result of this meeting, it is my understanding that the following practices will be implemented regarding aquifer exemptions:

- (1) EPA will recognize and approve aquifer exemptions for all existing production zones with the initial program approval. As stated in your letter of March 21, 1982, you will supply maps of the productive zones.
- (2) If any expansion of current production zones necessitates the extension of an exempted aquifer in the same horizon, the TRC will send the permit application for any proposed injection into this extended area to EPA Region 6 for concurrence prior to issuance of the permit.
- (3) EPA will take action on any application submitted under item #2 above within five working days.
- (4) Extension of aquifer exemptions for production zones will not be granted if the area proposed for exemption is currently being used as a drinking water source. This will be examined in the area of review for any proposed injection well in the area proposed for exemption.
- (5) Aquifer exemptions for any new production fields, or for any non-producing zones, will be submitted for EPA concurrence as outlined in 40 CFR 122.35 (b).

Figure 3. Letter from EPA to Railroad Commission March 29, 1982

The reasons for reviewing on a case by case basis are the occurrences of numerous hydrocarbon-producing reservoirs that contain or may contain water with less than 10,000 ppm total dissolved solids and the existence of extensive, undelineated aquifers that contain water with less than 10,000 ppm total dissolved solids.

Figure 4. Texas UIC Primacy Application Program Description

Further, the Railroad Commission agreed that conditions where injection into USDWs could happen were common. It was even noted in the Program Description document as a reason for oversight. [See Figure 4.]

Railroad Commission Confirms Lapses in Oversight that Puts Drinking Water at Risk

EPA acknowledges the clear issues with state oversight and is taking steps to develop a comprehensive inventory of aquifer exemptions nationwide and to develop a “consistent and predictable process for the review of Aquifer Exemptions requests.”⁶ Through this process and due to sustained public interest,

the Railroad Commission admitted to inconsistent oversight of exemptions and outlined resource capability issues. These failures prevented the Railroad Commission from adequately assessing the number of wells that may have been illegally injecting into potential sources of drinking water.

In March 2016, the Railroad Commission provided proof of at least two injection wells permitted into USDWs without an aquifer exemption and admitted there were more wells in a “handful” oil fields where the water is deemed of drinking water quality (under 10,000 mg/l Total Dissolved Solids).⁷

Additionally, EPA stated that the Railroad Commission said it would be an “administrative burden” to identify all wells potentially permitted without the required aquifer exemption.⁸ In its End the Year

Clean Water Action is skeptical of the Railroad Commission's view that its program is effective in protecting USDWs.

Evaluation of the Texas Class II UIC program, EPA on August 15 2016 noted that the Railroad Commission has said it is “moving forward with identifying and delineating historical and current aquifer exemption areas which are considered exempt from full UIC regulation,” it has still not delivered this information necessary to determine whether its UIC program is adequate to protect USDWs. EPA recommends “continued high prioritization of this effort”.⁹

As a result, Clean Water Action is skeptical of the Railroad Commission's view that its program is effective in protecting USDWs. Given that the Commission has not done the work to publicly identify all wells that are injecting into potential sources of drinking water, we disagree that the wells provided as an example of “little to no risk” to USDWs, present an accurate picture of the Railroad Commission's 54,811 injection well inventory.

There is a gap in understanding around whether or not the Railroad Commission has permitted oil and gas wastewater disposal wells to inject into USDW's. Clean Water Action acquired a database of Texas injection wells, which includes over 13,000 disposal wells injecting into non-productive zones (including both active and plugged).¹⁰ The files for these wells do not include accessible and specific water quality

information of the injection zone. Salinity information would be necessary to determine whether injection is occurring into a USDW. Importantly, these areas were not given blanket aquifer exemptions in 1982 because they are not injecting into producing zones. The Railroad Commission has not addressed whether or not disposal wells have injected into USDWs.

There are alarming similarities between the documented failures of California's UIC program and the Railroad Commission's view of federal standards meant to protect drinking water.

The sheer number of injection wells permitted since Texas took over control of its program suggests there was a streamlined approach to permitting injection wells that failed to adequately protect USDWs. We are just beginning to determine the cost.

There is a gap in understanding around how the Railroad Commission handled injection into USDWs when it permitted oil and gas wastewater disposal wells.

Texas Water Issues

Failure of the Railroad Commission to implement a program that is protective of USDWs is all the more alarming given that Texas faces serious water challenges due to continued population growth, frequent drought, and the impacts of climate change.



Localities across the state are re-evaluating aquifers once thought too brackish for human consumption. The state legislature has encouraged this.

For example, House Bill 30 “related to the development of seawater and brackish groundwater,” passed by the legislature in 2015, states in part that, “For many years this (brackish) water was considered largely useless for most purposes, but advances in technology and pressures on other supplies have revealed that brackish groundwater is in fact a vital resource. In addition to providing potentially vast new supplies, the development of brackish

groundwater can reduce pressures on the use of fresh groundwater.”¹¹

Acting at the direction of the Texas Legislature, the Texas Water Development Board is compiling maps and characteristics of brackish groundwater in its Brackish Resources Aquifer Characterization System (BRACS) helping communities assess the viability of their brackish groundwater supplies. The BRACS project is due to be completed in 2022. Texas currently has 34 municipal groundwater desalination plants.

Railroad Commission Must Reform UIC Oversight to Protect Drinking Water

Clean Water Action contends that the protection of potential drinking water supplies in Texas, especially those in drought prone areas, must be paramount. The Railroad Commission needs a dramatic overhaul of aquifer exemption oversight in its UIC program:

- Complete an inventory of all injection wells, including disposal wells into non-productive zones, to determine water quality information for the injection zone and to determine whether or not injection has occurred into USDWs.
- Provide the necessary documentation for all injection wells that operated in <10,000 mg/l TDS groundwater, and develop a database with all the necessary water quality, location, regulatory criteria and Statement of Basis information for associated aquifer exemptions.
- Immediately halt injection activities that are occurring in USDWs, until all necessary aquifer exemptions are granted by EPA.
- Require water quality information of the injection zone and demonstration of zonal isolation from USDWs in all future UIC permit applications prior to project and well approvals.
- Provide a clear process for all future injection well permit applications to ensure that injection into USDWs does not occur.



- Develop a process for submitting aquifer exemption applications to EPA that includes public notice and a public hearing and opportunities for public comment.
- Map all current, past and future oil and gas production fields and wastewater disposal fields to determine if these areas contain USDWs.
- Until these protections are put in place, there should be statewide moratorium on approving any injection well that meets the criteria for an aquifer exemption.
- Undertake a comprehensive review of UIC regulations to ensure protections of USDWs and other future potential drinking water supplies.

EPA should consider what the breakdown in oversight of Texas aquifer exemptions means for the broader national program and take additional steps:

- Complete the national aquifer exemption database and develop a way to update it consistently to provide EPA headquarters and regions with sufficient information on aquifer exemptions to oversee state and EPA-managed programs.
- Conduct annual on-site UIC program evaluations.
- Conduct a comprehensive workforce analysis to identify the resources and staff necessary to oversee state and EPA-managed programs and effectively protect underground sources of drinking water.
- Conduct a third-party review and evaluation of Railroad Commission of Texas' Class II Underground Injection Control program for full compliance with the program description and memorandum of agreement submitted in association with the State of Texas application for primacy that was approved in 1982.
- EPA should expedite the oversight activities identified by the Government Accountability Office in its 2016 report:¹²
 - Complete the national aquifer exemption database and develop a way to update it consistently to provide EPA headquarters and regions with sufficient information on aquifer exemptions to oversee state and EPA-managed programs.
 - Conduct annual on-site UIC program evaluations
 - Conduct a comprehensive workforce analysis to identify the resources and staff necessary to oversee state and EPA-managed programs and effectively protect underground sources of drinking water.

NOTES

- 1 Fiscal Year 2015 EPA Region 6 End-of-Year Evaluation Railroad Commission of Texas Underground Injection Control Program.
- 2 Safe Drinking Water Act Section 1425.
- 3 The Railroad Commission to EPA March 10 1982.
- 4 40 CFR 146.4. 40 CFR 144.7. Grevatt, Peter. *Enhancing Coordination and Communication with States on Review and Approval of Aquifer Exemption Under SDWA*. U.S. Environmental Protection Agency. Office of Ground Water Drinking Water. July 24, 2014. "EPA is responsible for final review and approval of all aquifer exemption request, based on the regulatory criteria in 40 CFR 14.6.4."
- 5 Foster, David. "FOIA Request for Records Relating to the Texas Railroad Commissions Class II Underground Injection Control (UIC) program, specifically as it relates to aquifer exemptions." December 9, 2015. Additional requests were made through correspondence with Leslie Savage, Assistant Director for Technical Permitting, Railroad Commission of Texas.
- 6 Grevatt, Peter. *Enhancing Coordination and Communication with States on Review and Approval of Aquifer Exemption Under SDWA*. U.S. Environmental Protection Agency. Office of Ground Water Drinking Water. July 24, 2014.
- 7 The Railroad Commission to Region 6 EPA March 28, 2016.
- 8 EPA to the Railroad Commission June 1, 2015.
- 9 Fiscal Year 2015 EPA Region 6 End-of-Year Evaluation Railroad Commission of Texas Underground Injection Control Program.
- 10 The Railroad Commission website notes there are 8,100 active disposal wells, most of which inject into non-productive zones. <http://www.rrc.state.tx.us/about-us/resource-center/faqs/oil-gas-faqs/faq-injection-and-disposal-wells/>
- 11 H.B. No 30. <http://www.capitol.state.tx.us/tlodocs/84R/billtext/pdf/HB00030F.pdf#navpanes=0>
- 12 Government Accountability Office. EPA Needs to Collect Information and Consistently Conduct Activities to Protect Underground Sources of Drinking Water. February 2016.

Acknowledgements

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