



# Environmental and Community Impacts of Shale Development in Texas

Highlights from the TAMEST Shale Task Force Report



The TAMEST Shale Task Force report is an independent, comprehensive review of scientific research on the impacts of shale oil and gas development in Texas.

## **TAMEST**

*The Academy of Medicine,  
Engineering & Science of Texas*

[tamest.org/shaletaskforce](http://tamest.org/shaletaskforce)



Texas is in a unique position to help us understand both the benefits and consequences of shale development. Texas has had the most dramatic increase in oil and natural gas production of any state in the last decade. Since 2011, Texas oil production has doubled, and the state now accounts for roughly a third of oil and natural gas production in the nation.

With nearly 250,000 wells in the state and 85 percent of Texas counties producing oil and gas, a great number of Texans have experienced the impacts of shale development directly. The goal of the TAMEST Shale Task Force report is to provide a clear, science-based assessment of these impacts and the gaps in our current knowledge of them. It is hoped that this report will allow Texans and other states and nations to learn and benefit from the Texas experience.

**Christine Ehlig-Economides (NAE)**

TAMEST Shale Task Force Chair  
Professor, Petroleum Engineering  
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# Shale Development in Texas: At a Glance

In 2015,  
**Texas produced more  
oil than all but  
6 countries**  
in the world.



**1.1 BILLION BARRELS  
OF OIL** were produced in  
Texas in 2016.



There are nearly  
**250,000**  
oil and gas wells  
in Texas.



**215/254**

Texas counties produce  
oil and natural gas.



Oil and natural gas  
production generated over  
**\$1.7 BILLION**  
in property tax revenue  
for Texas schools in 2016.



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# SHALE DEVELOPMENT



## Seismicity Impacts

**Before 2008,**  
Texas recorded about  
**2 earthquakes a year.**



**Since then,**  
there have been about  
**12–15 a year.**



Some earthquakes are linked to wastewater disposal from oil and gas operations.

### Next steps:

- Seismic monitoring stations in Texas will increase from 18 to 43.
- Wastewater disposal wells near earthquake locations now must receive special approval from regulators.

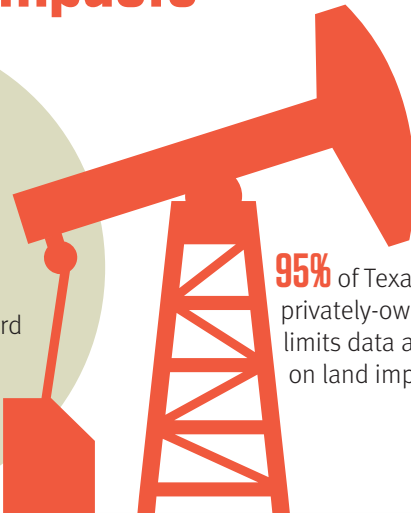


## Land Impacts

**Texas ranks #11** in the nation for at-risk species.

**2** species are known to be threatened by oil and gas development:

- Dunes Sagebrush Lizard
- Lesser Prairie Chicken



**95%** of Texas lands are privately-owned, which limits data and studies on land impacts.

### Next steps:

- Land surface impacts can be reduced with horizontal wells, where multiple wells can be drilled from a single pad.
- Baseline studies on land and ecosystems are needed.



## Air Impacts

Oil and gas emissions are dominated by a small group of sources.

**For most sources, ~5% of emitters account for more than 50% of emissions.**

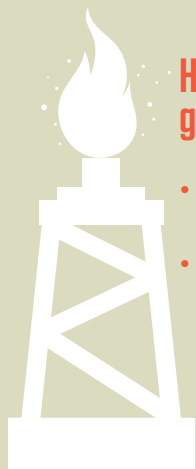
### Next steps:

- Some recent regulations have reduced emissions.
- New technologies such as infrared cameras enable rapid detection of emissions.

# IMPACTS



## Water Impacts



**Hydraulic fracturing uses 1–5 million gallons of water per well on average.**

- Accounts for less than 1% of total statewide water use.
- Could account for 90% of total water use in some rural counties.

### Next steps:

- More research to increase usage of poor-quality waters instead of freshwater.
- Increase prevention of leaks and spills on or near ground surface, which are most likely to contaminate drinking water sources.



## Transportation Impacts



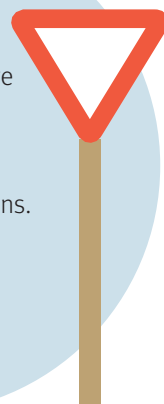
Road damage from oil and gas operations costs an estimated **\$1.5–2 billion** a year.



Rural crashes involving commercial vehicles have increased over **75%** in some drilling regions in Texas.

### Next steps:

- Additional preventative maintenance and guidelines would help reduce crashes and improve road conditions.



## Community Impacts

### Communities in shale regions:



**LIKE** the economic benefits to property values, schools and medical services.



**DISLIKE** the impacts on traffic, public safety, environmental concerns and noise.

**OVERALL** development primarily contributes positively to local, regional and state economies.

### Next steps:

- Social science research could lead to a better understanding of the issues these communities face.
- Unique outreach needed for each community; there's no one-size-fits-all approach.





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