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New study offers first ever look at shale's impact in Texas

By Luke Geiver | June 27, 2017

A group of experts in the fields of medicine, engineering and science believe they've completed the first-of-its-kind study on the impact of shale oil and gas development in Texas. For roughly two-years, The Academy of Medicine, Engineering and Science of Texas (TAMEST) performed research, compiled and analyzed data and held group meeting sessions in an effort to better understand shale development using the best science to date. The resulting report now has recommendations for future research, areas in need of greater collaboration and considerations for policies necessary to help mitigate impacts of shale development.

"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," said Christine Ehlig-Economides, chair of the task force. "It is hoped that this report will allow Texans and other states and nations to learn and benefit from the Texas experience."

To formulate the report, the TAMEST group mimicked the processes used by the National Academies by utilizing data sets, information and topic-specific expertise to produce conclusions on the impact of shale oil and gas development.

The study focuses on six areas: seismicity, land, air, water, transportation and economic and social impacts.

Danny Reible, the Donovan Maddox Distinguished Engineering Chair at Texas Tech University, worked on the water impacts portion of the study. TAMEST has long felt it should have a role in providing advice for the state of Texas on shale, just as National Academies do for the Federal government in regards to other topics, Reible said. "One of the first concerns you always have with shale development is how much water do you need and to what extent does that impact Texas," he said. In 2011, shale development was going through rapid growth and coinciding with a historic draught in Texas. Despite the scenario, the water-focused team concluded that the water needs of the shale development industry do not have much of an impact. "In general it [water volumes for shale] isn't a large amount of water compared to other needs in the state," he said.

"We also examined the issue of hydraulic fracturing leading to contamination of groundwater aquifers that we might tap into in the future," he said, noting that the team found there to be little to no issue with fracking and water contamination.

The main concern for the water team is surface level spills of produced water. Michael Young, another member of the TAMEST water team, said their analysis of water usage and practices by shale development firms shows how connected water—and several of the other focus areas in the study—are to the total impact of shale on land and communities. Young, the senior research scientist for the Bureau of Economic Geology at the University of Texas, said the water team tried to highlight the need for an integrated solution for water resources. Such a solution, he said, can and will be difficult to arrive at. "If we try and reuse water, we might be processing more," he said.

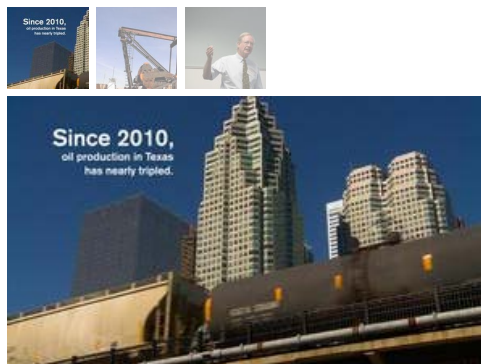
The connection of each focus area in the study was a major theme and important area of discussion between all of the researchers working on the Shale Task Force, Young said.

During multiple, multi-day meetings the task force was able to look at different aspects of shale development "and have candid discussions about how different topics overlapped each other," Young said. "It is not common to have all of these people in the same room in a very open way. It gave us a perspective we didn't have before we started."

The task force arrived at the following findings or recommendations.

Seismicity:

After 2008, Texas has recorded roughly 12 to 15 earthquakes per year. Prior to that, the average was two earthquakes per year. The increase is related in some cases to wastewater disposal from oil and gas operations. The state will now increase its monitoring stations from 18 to 43 in order to learn more about



Shale oil and gas development takes a major toll on roads each year in Texas. The study provides insight into specifics and what can be done to improve on transport issues in the future.

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the physics of wastewater disposal and how it might play into earthquakes. Wastewater disposal wells must also now receive special approvals from regulators before being constructed.

Land:

Because 95 percent of land in Texas is privately owned, it is difficult to acquire data on the surface impacts of shale oil and gas development. However, the research team believes it should begin studying changes in wildlife populations or vegetation. The study also recommends looking into creating regulations ensuring surface owners are not negatively impacted by development. Texas is the only state that does not have regulations to protect surface owners.

Air:

In shale development, certain emissions sources account for a high percentage of total emissions, the study said. Although some regulations have helped to reduce emissions that are present, new technologies such as infrared cameras that enable rapid detection of emissions should be used more frequently.

Water:

Water used for fracking accounts for less than 1 percent of total statewide water use, according to the study. In the future, more research should be done to increase the usage of poor-quality waters instead of freshwater. And, more should be done—through technology or regulations—to better prevent leaks and spills of produced water.

Transportation:

On average, road damage from oil and gas firms equal \$1.5 to \$2 billion per year. Additional preventative maintenance and guidelines would help reduce crashes and improve road conditions. And, temporary pipelines on state-owned right of ways could help. Research is currently being done to develop guidelines for that practice.

Economic and Social Impacts:

Although there is no one-size-fits-all outreach effort that can yield overarching conclusions on the impact of shale development on communities, the study did find that communities in shale regions like the economic benefits to property values, schools and medical services. Communities disliked the impacts on traffic, public safety, environmental concerns and noise. "Overall, shale oil and gas development primarily contributes positively to local, regional and state economies," the report group said.

To read the 204-page report, [click here](#).

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