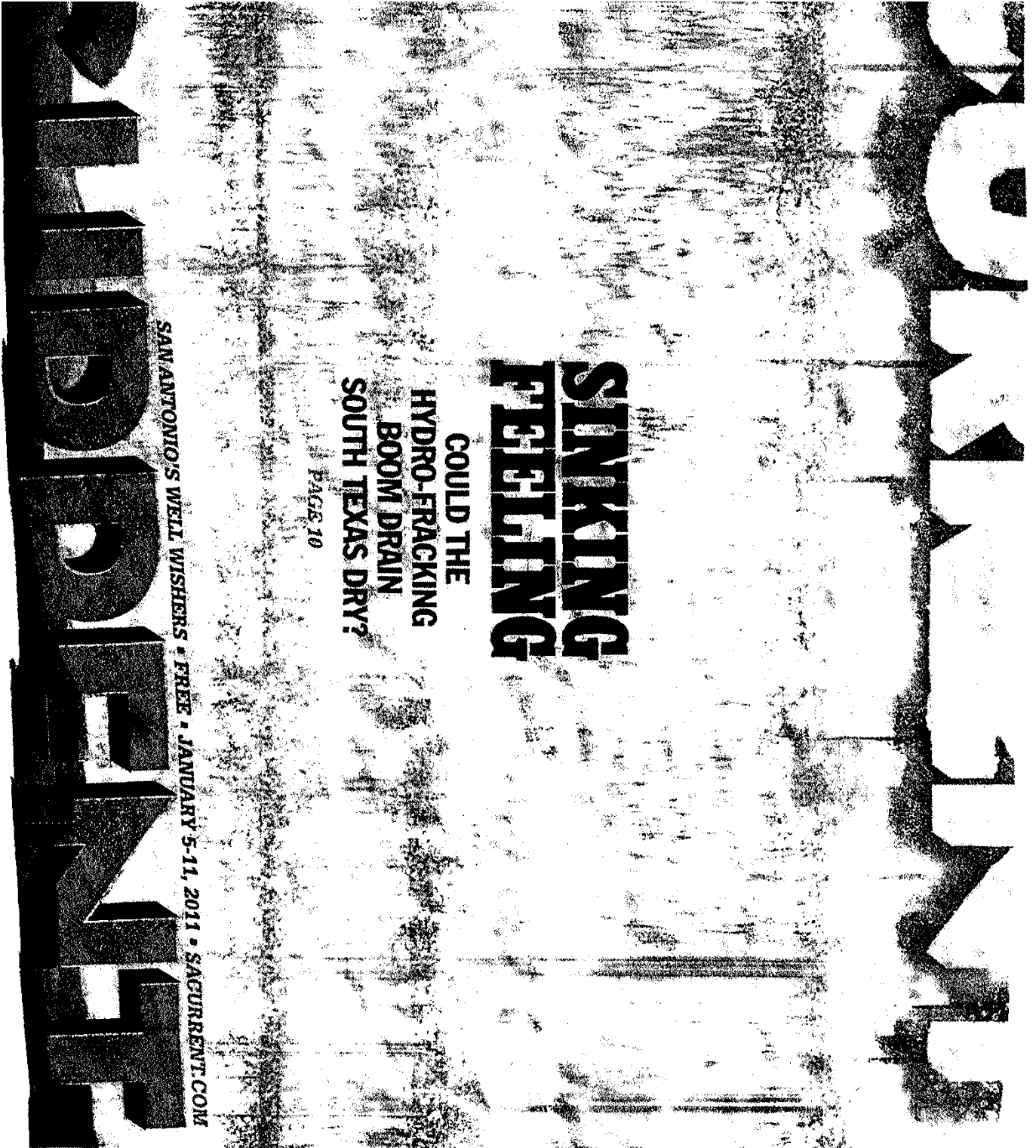


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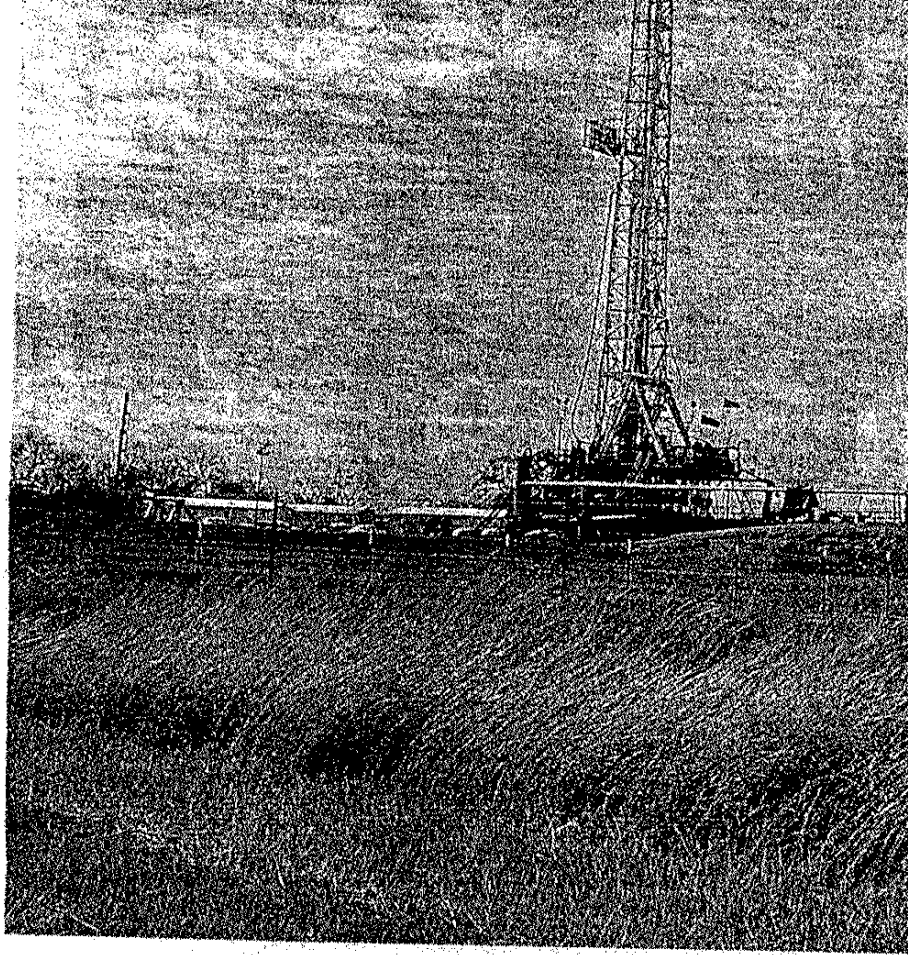
SINKING FEELING

**COULD THE
HYDRO-FRACKING
BOOM DRAIN
SOUTH TEXAS DRY?**

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ROBERT



KARNES COUNTY — Veteran oilman John Braudaway has been in the industry so long that he says he can estimate the amount of crude in a 400-barrel storage tank just by feeling slight temperature differences on the metal surface.

While that may sound like a Texas tall tale told by an affable septuagenarian who bears a slight resemblance to Tommy Lee Jones, one thing's for sure: Braudaway has enough oilfield wisdom to know that the frenzy around the Eagle Ford Shale is different than any boom he's seen since his early days working South Texas oil fields in the 1950s.

This time around, the wells are drilled horizontally, and then there's the potential that hydraulic fracturing, or "fracking," will have long-term effects on South Texas water tables in a region that has long struggled with drought. A typical fracked well in Karnes County uses 3 to 6 million gallons of water, which is pumped thousands of feet underground to release oil and gas from the shale formation.

Many in Karnes County welcome the boom, but the water issue keeps confronting the oil industry. "They already know they're gonna run this area out of water; there's no ifs, ands, or buts about it," said Braudaway, whose livelihood still depends on oilfield services.

For some folks, the water future of South Texas boils down to simple math — when you suddenly pull millions of gallons from local aquifers without replenishing that supply, there's going to be less for homes, farms, and ranches. "We know it's happening because our water well has already dropped in just three months," said Allan Hedtke, a Karnes City resident.

In spite of off-and-on drought conditions, Hedtke's well held steady at 225 feet below ground for years before suddenly dropping to 300 feet last fall. Hedtke and neighbors with similar experiences feel strongly that the recent drilling and oil production activity nearby caused the change. "I can't prove it's them, but there's no other explanation," he said.

Soon after Eagle Ford drilling activity picked up last year, other South Texans complaining of low water wells prompted the Evergreen Underground Water Conservation District to launch a new monitoring program in four counties where some of the heaviest drilling and fracking takes place. "We really have no idea how much water they are pulling from our area, and it's really frustrating," said Larry Akers, assistant manager of the Evergreen district, the water planning agency for Atascosa, Frio, Karnes, and Wilson counties.

Sinking feelings

Gas fracking may already be lowering water tables in South Texas.
by Robert Crowe



Photos by Robert Crowe

In three months, the well monitors have shown slight decreases of a foot or less, but nothing conclusive enough to determine whether oil and gas drilling is the cause. "I think it's a lot of fear now, but that fear will become a real problem (for the water supply) in the next five years," Akers said.

Regulation lacking

Similar water issues played out in North Texas over the past decade with the Barnett Shale development. Pressure on the Trinity and Woodbine aquifers prompted the Texas Water Development Board (TWDB) to designate that region a "priority groundwater area" and form the Upper Trinity Groundwater Conservation District. A TWDB study found that oil and gas development in 2005 consumed 3 percent of all Trinity and Woodbine groundwater and was expected to increase up to 13 percent by 2025.

"The whole situation does create a quandary for water districts," said Billy Howe, state legislative director of the Texas Farm Bureau. "Do you do something to slow production in those gas fields?"

As Akers and other Evergreen officials have discovered, water conservation districts have no real teeth to regulate the oil and gas industry's use of water. Permits are not required for water wells

that support oil and gas operations, and there are no water limits, Akers said. Oil rigs servicing water wells, however, must be registered with the local water conservation district, and property owners are required to file monthly use reports. Few, however, register wells, and many of those who do often send reports three months late, Akers said. With limited staff, Evergreen cannot even verify metering accuracy.

"The state's regulatory response is not protecting our groundwater at all," said Sharon Wilson, a North Texas blogger and activist who documents problems with fracking and drilling in the Barnett Shale.

Pollution concerns

Fracking is a controversial technology blamed for contaminated water, wells and air pollution across the country. Cabot Oil, a Texas company with serious investment in the Eagle Ford Shale, recently agreed to pay \$4.1 million to Pennsylvania residents whose water wells were contaminated with methane. The *Current* reported in June that 70 percent of residents sprayed in the North Texas town of Dish were complaining of breathing difficulties, and, in August, that formaldehyde levels at a Titan Engineering site in North Texas



Old-time Karnes County oil man John Braudaway talks to one of his employees about monitoring an oil rig.

were recorded at levels known to cause breathing problems, levels one investigator characterized as "astoundingly high."

In the fracking process, water is combined with a mixture of toxic chemicals (the composition of which industry has routinely refused to disclose to regulators) before it is pumped into the oil or gas well. Up to 90 percent of the water disappears underground, while the remaining supply, considered highly toxic, returns to the surface to be trucked to another location and injected 8,000 to 15,000 feet underground in disposal wells.

The potential to contaminate water wells with chemicals and gas seepages increases every time wells are fracked near potable supplies, said Alyssa Burgin of the Texas Drought Project. "People are astoundingly ignorant about all this," Burgin said. "They're all so excited about the money and checks these companies are writing them that no one has made a negative comment."

Akers said the Evergreen district has not received any complaints similar to the well-contamination horror stories featured in the documentary *Gasland* and countless media reports from across the country. Still, such events are inevitable in South Texas, says Wilson. "I've been telling people in South Texas that once they drill on your land, it will never be safe again," she said.

After she encouraged church leaders in South Texas to host a public screening of *Gasland*, they responded by saying that oil and gas companies had insisted the film was anti-industry propaganda.

Economic impact

The Eagle Ford has been touted as the country's largest shale play, attracting major domestic and foreign companies to invest billions in exploration. Gas-well production tripled last year, while oil production increased from 304,500 barrels in 2009 to 1,629,055 in 2010, according to the Railroad Commission of Texas. With oil prices fetching \$90 a barrel and climbing, the indus-

try is focusing on developing crude, but natural gas is still collected and can be further developed with an increase in price.

In Karnes County, 300 new oil and gas drilling permits have been issued. Karnes City, the county seat, pulled 216.2 million gallons of water for municipal use in 2009. If those 300 drilling permits issued result in the use of at least 3 million gallons of water for each site, fracking activity would more than double the water used by Karnes City's 15,000 residents in one year.

Water in Karnes County

The immediate concern is that fracking has lowered water in the "water sands," an area ranging between 100 to 700 feet underground where potable water is found. Braudaway said pressure on those wells forces drilling even deeper — about 3,000 feet, where water from the Carrizo-Wilcox Aquifer comes out scalding hot. Still, even this concerns Akers of the Evergreen district because the Carrizo-Wilcox is the main aquifer for the region.

Johnny Moy, co-owner of Thomas Moy & Sons Water Well Drilling, said his family's company does plenty of business to serve the fracking needs of the biggest names in the oil industry. "I've seen [the water table] go down a little bit, but there's still plenty of water down there," he said.

Water has become such a hot commodity that some property owners have begun drilling water wells to supply the fracking industry. That water is supposedly transported by truck or in temporary pipelines, up to 10 miles in some cases.

Barclay Houston, the San Antonio-based chief financial officer for Supreme Vacuum Services, said his company made a conscious decision to drill supply wells 8,000 to 15,000 feet to capture non-potable, salty water. "There's a misconception that we're all destroying potable water, and that's absolutely untrue," he said.

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Long-term planning

Oil and gas drilling has complicated efforts by the Texas Water Development Board to plan for sustainable water use over the next 50 years. Water wells that serve the oil industry are not required to report usage when factoring the desired future condition (DFC) estimates for long-term planning.

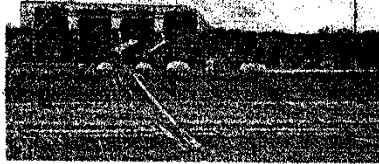
"It's something the Legislature will eventually have to address," said Paul Bordovsky, Evergreen's board president.

Bordovsky said the oil and gas boom has been great for the local economy, and he has no complaints since leasing mineral rights on his Karnes County ranch to ConocoPhillips. He is skeptical, however, that the oil industry is lowering water tables. "There's a good bit of hysteria about it," he said.

On his property, located in a relatively dry patch of Karnes County, water wells were not drilled for fracking. Instead, water was trucked in and stored in large tanks.

In an area not too far from Bordovsky's ranch, where drilling rigs have popped up over the past year, Hedtke and other property owners are wondering how much lower they will have to submerge water pumps to supply residences and cattle ponds. "Our water drop was rather sudden," said Marvin Wittie, the owner of a 400-acre cattle ranch with a pending oil and gas lease. He expects the drilling companies to begin exploration sometime in the next two years. "It's a scary thought that all the oil in the world ain't gonna help you if you don't have water to drink." •

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**FRACKING'S
SHORT, DIRTY
HISTORY**

Developed decades ago, hydraulic fracturing involves the process of breaking up heavy oil- and gas-bearing shale formations by pumping millions of gallons of chemically tainted water through vertical and lateral wells at intense pressure. Only in recent years has the practice become cost effective for industry, as advances in technology have been matched by rising energy prices. In South Texas, operators are increasingly honing in on the Eagle Ford shale formation, which stretches from several counties to the northeast of San Antonio all the way to Maverick County on the U.S.-Mexico border. Here is a short list of fracking-related troubles that have arisen across the country in recent years.

Colorado — A three-year study in Garfield County detailed the migration of methane from fracking operations through natural faults into potable water supplies, but state regulators also fingered faulty casing work by EnCana Oil and Gas for water well contamination, fining the company \$370,000.

Pennsylvania — In a land of exploding water wells and quarantined cows, residents of Dimock, Pa., sued Houston-based Cabot Oil & Gas in 2009 after a range of chemicals linked to fracking contaminated water wells. Pennsylvania's Department of Environmental Protection fined the company more than \$240,000. However, the price tag associated with trucking in clean water to homeowners has been placed at more than \$10 million.

Wyoming — In September 2010, the EPA discovered water wells in Wyoming were contaminated with 2-butoxyethanol phosphate, a common fracking fluid with a range of harmful human-health impacts, and instructed community residents not to drink their water. *Indian Country Today* reported residents of the Wind River Indian Reservation began using fans while bathing to

reduce the risk of explosion. Meanwhile, lawmakers passed rules forcing oil and gas companies in the state to divulge the full list of chemicals used in fracking operations. In an echo of BP's tussle with the Feds over the makeup of the dispersant Corexit, industry has argued to the EPA that such information must be kept secret as competitive trade information.

New York — Following warnings that contaminated aquifers requiring the construction of industrial treatment plants would raise New York City water rates by a minimum of 30 percent, New York Governor David Paterson issued a statewide seven-month moratorium on "high-volume" fracking in December of 2010.

North Texas — Jay Olaguer, director of air-quality research at the Houston Advanced Research Center, reported last summer that industry is regularly underestimating air emissions from fracking and natural-gas development in the DFW area. He reported that formaldehyde readings in one industry study — which reached 126 parts per billion at one DFW location — were "astoundingly high." "I've never heard of ambient (formaldehyde) concentrations that high," he told the *Current*, "except in Brazil where they use alternative fuels such as ethanol and gasohol for automobiles." Beyond immediate public-health impacts associated with breathing formaldehyde, the chemical is also a powerful precursor to the creation of ground-level ozone.

Nationwide — A wide-ranging EPA study was launched last year after the agency acknowledged "there are serious concerns from citizens and their representatives about hydraulic fracturing's potential impact on drinking water, human health, and the environment." Initial findings on the feasibility of fracking are expected to be released in late 2012. — **Greg Harman**