

Sustainability

What Is Sustainability?



Sustainability is a multi-disciplinary focus on ensuring the compatibility of economic growth, social progress and environmental stewardship. The oil and gas industry's goal is to economically develop the natural resources necessary for global energy consumption in a way that protects the environment, and the human, plant and animal species that depend on it, now and in the future. The industry supports a social license to operate – an ongoing, broad social acceptance of the necessity of operations, and approval of those operations' methods.

In short, sustainability embodies a concept and attitude that natural systems and human patterns are integral pieces of economic development.

Our Efforts: Pioneer's Sustainable Development Team

Pioneer's dedication to leading our industry in sustainability efforts has led to the implementation of our Sustainable Development Team. The team's role is to ensure Pioneer's development activities are sustainable through the support of a broad perspective, comprehensive analysis and a concentrated focus on current and emerging risks, opportunities and challenges. The team uses information and knowledge gained through scientific analysis to reduce Pioneer's impact on the environment; provide cost-effective solutions; and to educate legislators, regulators and the public in order to influence government action and enhance our community relationships.

Sustainability at Pioneer is a collaborative, interdisciplinary effort between operational, engineering, legal, **safety**, **environmental**, corporate communications and government affairs teams, as well as with industry trade groups. We aim to ensure the availability of resources necessary for oil and natural gas operations by prioritizing the issues and arriving at effective solutions.

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- **Air**
- **Water**
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- **Hydraulic Fracturing**
- **Wellbore Integrity**

Air

To address specific sustainability issues surrounding air emissions, Pioneer's Sustainable Development Team has created an interdisciplinary group of experts, drawing from environmental, regulatory, engineering and asset operations across the company. The Air Technology Team maintains internal awareness of new federal and state emissions regulations in order to participate in the rulemaking dialogue and ensure Pioneer's record of exemplary compliance continues.

Pioneer's air initiatives require we develop a comprehensive understanding of our emissions footprint, so we have incorporated the use of advanced emissions measurement technology in our field operations. The detailed findings allow us to understand the impact on local and regional air quality and global climate.

The Air Technology Team embodies Pioneer's dedication to sustainable development by identifying opportunities for significant emissions reductions, collecting the necessary data and research, working closely with law and policy makers, and implementing effective best practices and technological solutions.

Water



Water usage by the oil and gas industry is a key component of our industry's social license to operate, and a topic of discussion in which we must enthusiastically engage with the public. Pioneer, along with numerous peer companies, has an ongoing commitment to innovative solutions to economically viable water conservation techniques within our daily operations.

Pioneer uses water for every hydraulic fracture completion, which includes nearly all of the wells Pioneer drills in 2012. While there is some public concern about the oil and gas industry's total water usage, recent data from the **Texas Water Development Board** indicates that only 1.6 percent of Texas' water usage is attributed to the mining, oil and gas industries. One of the largest users of water is irrigation, which utilizes 60 percent of Texas' water. According to one estimate, golf courses consume about the same amount of water as the oil and gas industry does.

Water is a central focus of Pioneer's sustainable development goals. The Water Technology Team consists of experts from our operational asset teams and the environmental, regulatory and engineering departments who have experience with water-related topics. The group works to achieve a practical understanding of the sustainability of water sources used in Pioneer's operations and helps determine the company's overall plans regarding water supply and distribution.

Such activities include understanding optimal use of brackish water for hydraulic fracturing, evaluating the possible use of produced water for hydraulic fracturing, and designing environmentally sound water treatment and distribution systems. Through internal efforts and collaborative research with industry water committees, Pioneer's Water Technology Team is able to incorporate solid scientific data into discussions surrounding water regulations and legislation, thus increasing collaborative relationships among industry groups, federal and state regulators, and the general public.

Seismicity

Pioneer works proactively to obtain and understand meaningful and accurate scientific data to guide our operating practices and to better inform regulatory agencies, industry associations and the public.

Contrary to common belief, induced seismicity, or minor tremors linked to human activities, are almost never associated with hydraulic fracturing. However, on a few occasions, underground water injection may have caused minor seismic events that were felt locally. A June 2012 National Academy of Sciences report, "Induced Seismicity Potential in Energy Technologies," concludes that water injection can pose some risk for induced seismicity, but only in special circumstances. Very few events have been documented over the last several decades relative to the large number of disposal wells in operation.

Hydraulic Fracturing

The safety and success of the hydraulic fracturing process over the past 60 years, as well as the benefits and costs of producing new domestic energy resources from shale plays, have received increased public interest in the last decade. Pioneer has been at the forefront of both national and state efforts to ensure the industry responds in a timely and transparent manner to these issues.

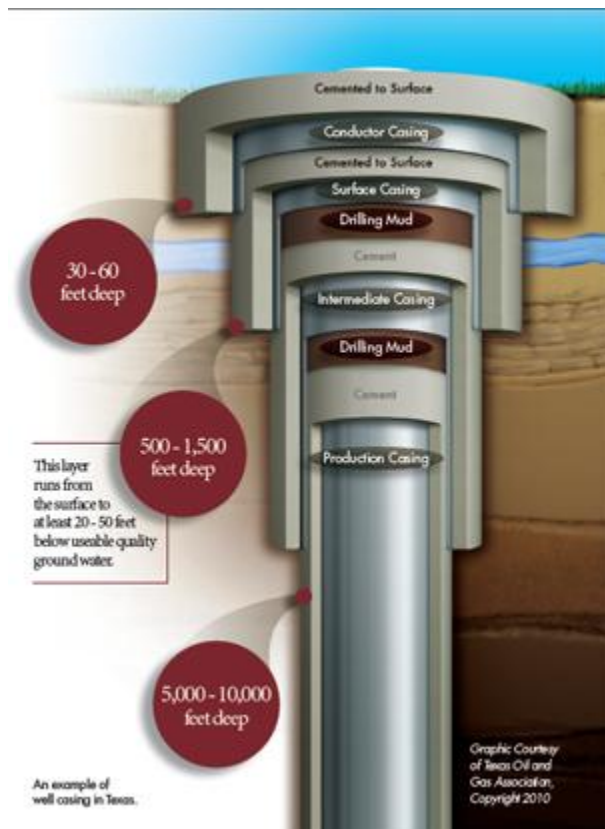
To help address questions about hydraulic fracturing, Pioneer — along with industry peers and regulators — has created the web site **FracFocus.org**, a public registry of reported chemicals used for hydraulic fracturing. In order to gather this information, a

group of technical experts from across the company have developed and disseminated proper reporting protocols and procedures for oil and gas companies to use.

Having long supported mandatory public disclosure of chemicals used in hydraulic fracturing, Pioneer welcomes the transparency of listing our own reports and will continue to actively support this national initiative and comply with state regulations on reporting hydraulic fracturing content. Pioneer Natural Resources, and its subsidiary Pioneer Pumping Services, are committed to pumping green alternatives where they exist.

Wellbore Integrity

Click image for larger view



When a well is designed, built and maintained properly, it is implicitly safe.

For decades, state regulators have imposed strict, comprehensive requirements for how oil and gas wells must be constructed. Each well must be encased in multiple layers of protective industrial-grade steel casing, which is surrounded by cement to create a redundant safeguard for underground freshwater supplies. The casing and cementing process may be repeated as the well deepens. This highly regulated safety system – and thousands of feet of rock – keeps oil and gas out of the freshwater and freshwater out of the oil and gas.*

Pioneer complies with and often exceeds state and federal regulatory requirements designed to protect groundwater and oil and gas resources when drilling a well. The primary method to ensure wellbore integrity is by installing multiple steel pipes with cement to seal the rock face and the space between the steel casings. This proven method has worked consistently in more than 1 million* wells stretching back to the early period of oil and gas development nearly 100 years ago.

For 365 days a year, we closely monitor the well’s pressure integrity and take immediate action if a repair is needed to the first barrier. Our operators, foreman and engineers are continually seeking to improve our designs and processes. We share best practices and lessons learned to eliminate risk to our fellow workers, our communities and our environment.

* Source: Adapted with permission from “Oil and Gas in Texas: A Joint Association Education Message from the Texas Oil and Gas Industry,” Copyright © 2010, Texas Oil and Gas Association. All rights reserved.