

Fact Sheet: Industry Practices and Trends Protecting Water Resources During Hydraulic Fracturing



The U.S. Environmental Protection Agency's Draft Assessment of the Potential Impacts of Hydraulic Fracturing for Oil and Gas on Drinking Water Resources was issued in July 2015, and comments were provided by the Science Advisory Board (SAB) in August 2016. The EPA Draft Assessment concluded that there was no evidence that hydraulic fracturing has led to widespread, systemic impacts on drinking water resources in the United States. The SAB makes recurring comments about the lack of information related to existing industry standards, best management practices, trends within the oil and natural gas industry, and state and federal regulations pertaining to hydraulic fracturing's potential effects on water resources.

The American Petroleum Institute, as the leader in developing operating standards for the oil and natural gas industry since its founding in 1924, provides this report summarizing the extensive protections provided by industry practices and regulatory programs to assist EPA in developing the final Assessment. The information is organized in parallel to the EPA Draft Assessment and the SAB comments, focusing on the steps of the hydraulic fracturing water cycle.

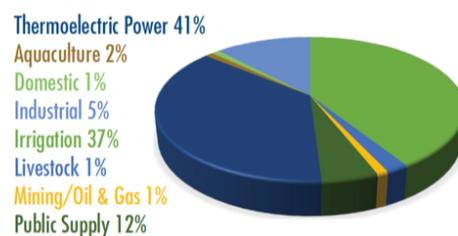
Chemical Mixing

The EPA Draft Assessment focuses on the potential for and causes of spills of chemicals used in hydraulic fracturing. The SAB is concerned that much of the data came from only Pennsylvania and Colorado, and that additional information about the standard practices that are applied to chemical mixing that reduce spill potential be provided. In fact, the EPA Draft Assessment relies on a much larger data set, including the ten states with the greatest rates of hydraulic fracturing between 2009 and 2010 for everything except spill frequency. The Pennsylvania and Colorado state databases include spill frequency related to hydraulic fracturing. These two states have the second and third highest amount of hydraulic fracturing in the US.

This report summarizes the large array of industry standards and best management practices to minimize spills and thereby protect water resources. The vast majority of onshore spills do not reach water resources. Spill protection is an area of steady improvement, and there are industry trends to utilize "greener" chemicals, keep more robust data on chemical use and spills, and report this information to the public.

Water Acquisition

The EPA Draft Assessment relies on data at state and county scales, while the SAB seeks information at even more local scales. At any specific place, based on specific local circumstances, it is possible that there may be an adverse effect based on acquiring water for hydraulic fracturing. The data at national, state, and local scales indicate that water acquisition does not lead to any widespread or systematic effects to water quantity. In areas where water is scarce, or where water acquisition has the potential for local effects, there is typically a regulatory program in place to minimize the likelihood of such effects. These programs balance the needs of all water users, including ecosystem services, to adjudicate water rights. Water use is an area where industry has shown continuous improvement. For example, technological innovation has enabled increased use of produced and brackish water for hydraulic fracturing.



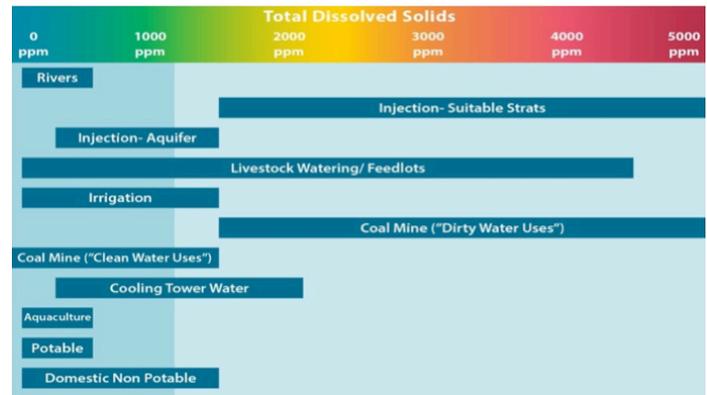
At state and national level water consumed for oil and gas industry is less than 1% of total water use. Local regulatory programs account for all water users when allocating water rights

Well Injection

EPA Draft Assessment identified injected fluid migration to shallower depths via compromised well integrity or subsurface geology to be of potential risk to water resources. The SAB requested additional information about industry standards and best management practices for well integrity. This report includes summaries of the extensive protections to ensure well integrity and prevent or minimize potential environmental impacts, including practices for well design, drilling, casing, cementing, well spacing and abandonment, as well as testing and monitoring. This report also explains how hydraulic fracturing occurs for one hour per stage, thus the well is only subject to pressure for a short duration. Once the well is brought on to production, the well is subjected to a relative vacuum force to extract fluids, the opposite type of pressure as hydraulic fracturing, and one that inherently protects water resources.

Flowback and Produced Water Management

The EPA Draft Assessment focuses on spills of flowback and produced water, and the SAB requests information on advancements in produced water management over the last several years. This report provides additional information on industry practices and trends with respect to improvements in flowback and produced water storage management and disposal and provides an extensive discussion of trends in produced water management, treatment, and beneficial reuse. This is an active area of research by industry, service providers, and regulatory agencies.

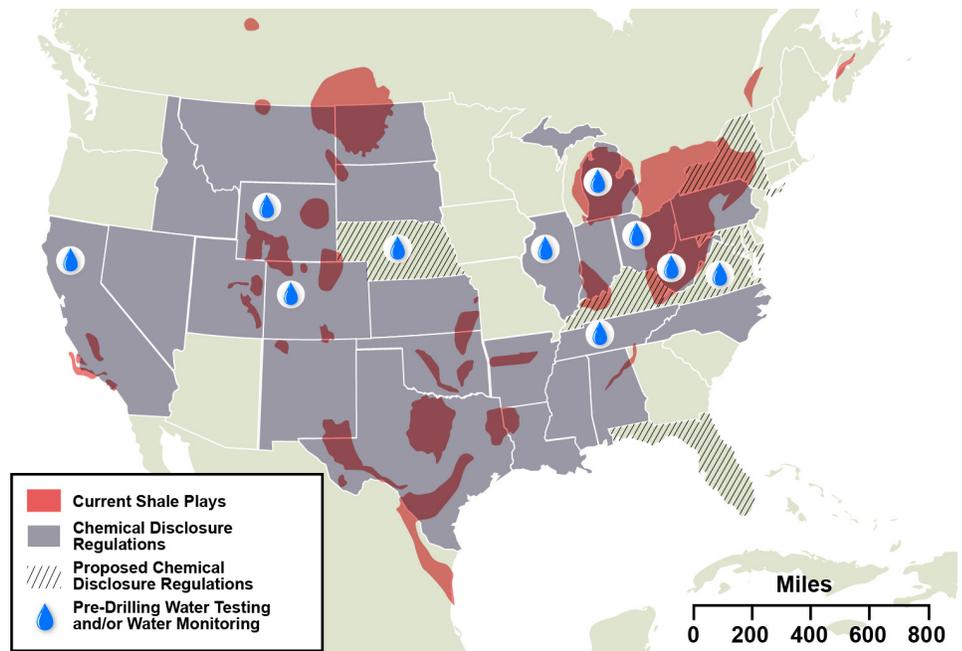


Site-Specific Produced Water Beneficial Reuse Compatibility Chart

Nationally and internationally, technologies are improving to increase options for the beneficial use of produced water by industry and other users.

Regulatory Framework

The SAB suggests that the EPA's Assessment would be strengthened by including a discussion of state regulatory standards that address the risk of water quality impacts associated with hydraulic fracturing. This report describes that states with hydraulic fracturing have expanded existing regulatory programs to address the process. Since hydraulic fracturing depends on local conditions, State regulatory frameworks are best positioned to address potential effects of hydraulic fracturing on water resources.



State Chemical Disclosure and Water Quality Monitoring Requirements

Overall, the report demonstrates that there is an extensive array of industry practices, industry trends, and regulatory programs that protect water resources from potential impacts of hydraulic fracturing at every step of the hydraulic fracturing water cycle, from initial water acquisition, through well injection to produced water disposal. In addition, water management is taking an increasingly prominent place in corporate governance of oil and gas companies to reduce risks and improve sustainability, ensuring that improvement will be an ongoing process. The prevalence of these practices nationwide is the likely reason why the draft EPA Draft Assessment found no widespread, systemic impacts on drinking water resources from hydraulic fracturing. The report documents these practices and protections, as well as the trends in innovation and improvement by industry. State regulatory frameworks are best positioned to address the local water resources in areas where hydraulic fracturing is conducted