

Hydraulic Fracturing: Regulatory Developments, Land Use, and Water Resource Conflicts

TexasBarCLE Webcast
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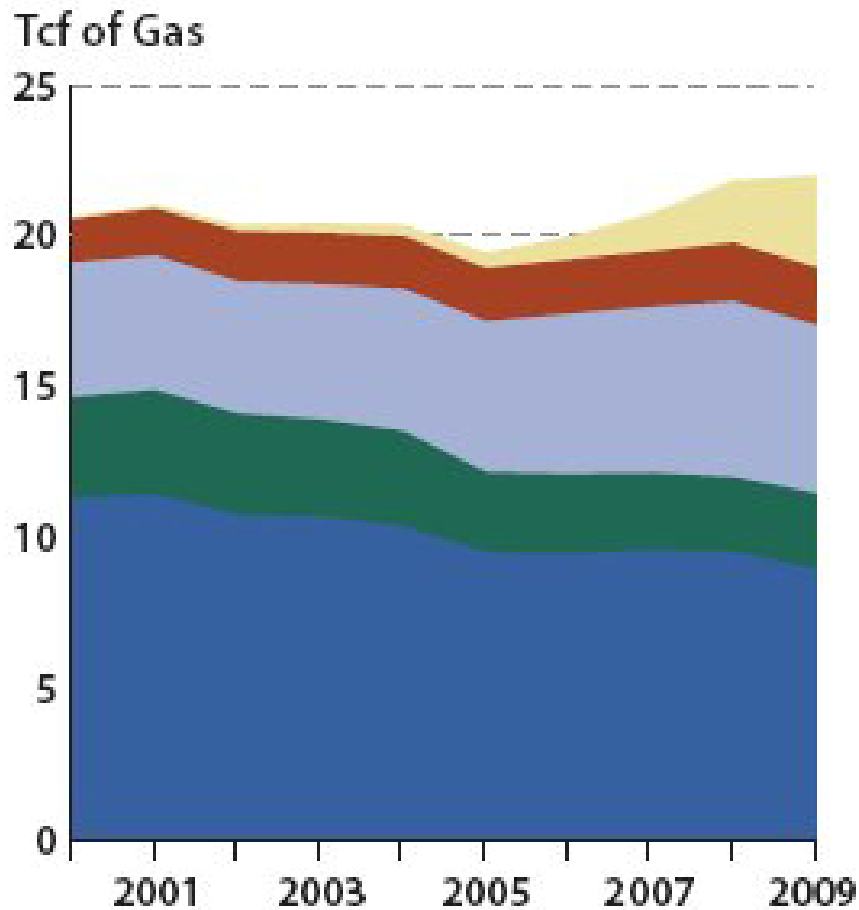
Hydraulic Fracturing Background

Hydraulic Fracturing Basics

- Patented in 1948; “shooting” wells dates back to 1860s.
- Method: Pump fluids at high pressure into producing formations to create fissures to allow more natural gas to escape.
- Principally takes place in horizontal wells, which may extend horizontally for thousands of feet at depth.
- Fracturing fluids are typically composed of:
 - 90% water
 - 9.5% sand
 - 0.5% other chemicals



Figure 2.13a Breakdown by Type of Annual Gross Gas Production in the L48 U.S. between 2000 and 2009



Source: MIT; HPDI production database

Figure 2.13b Percentage Breakdown by Type of Gross Gas Production in the L48 U.S. in 2000 and 2009

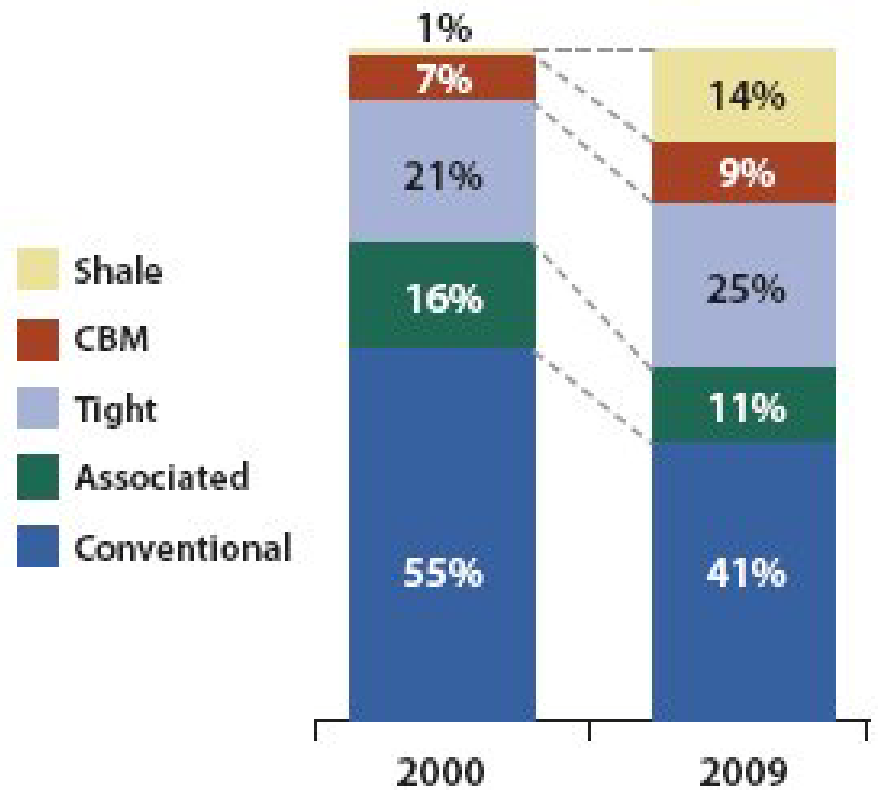
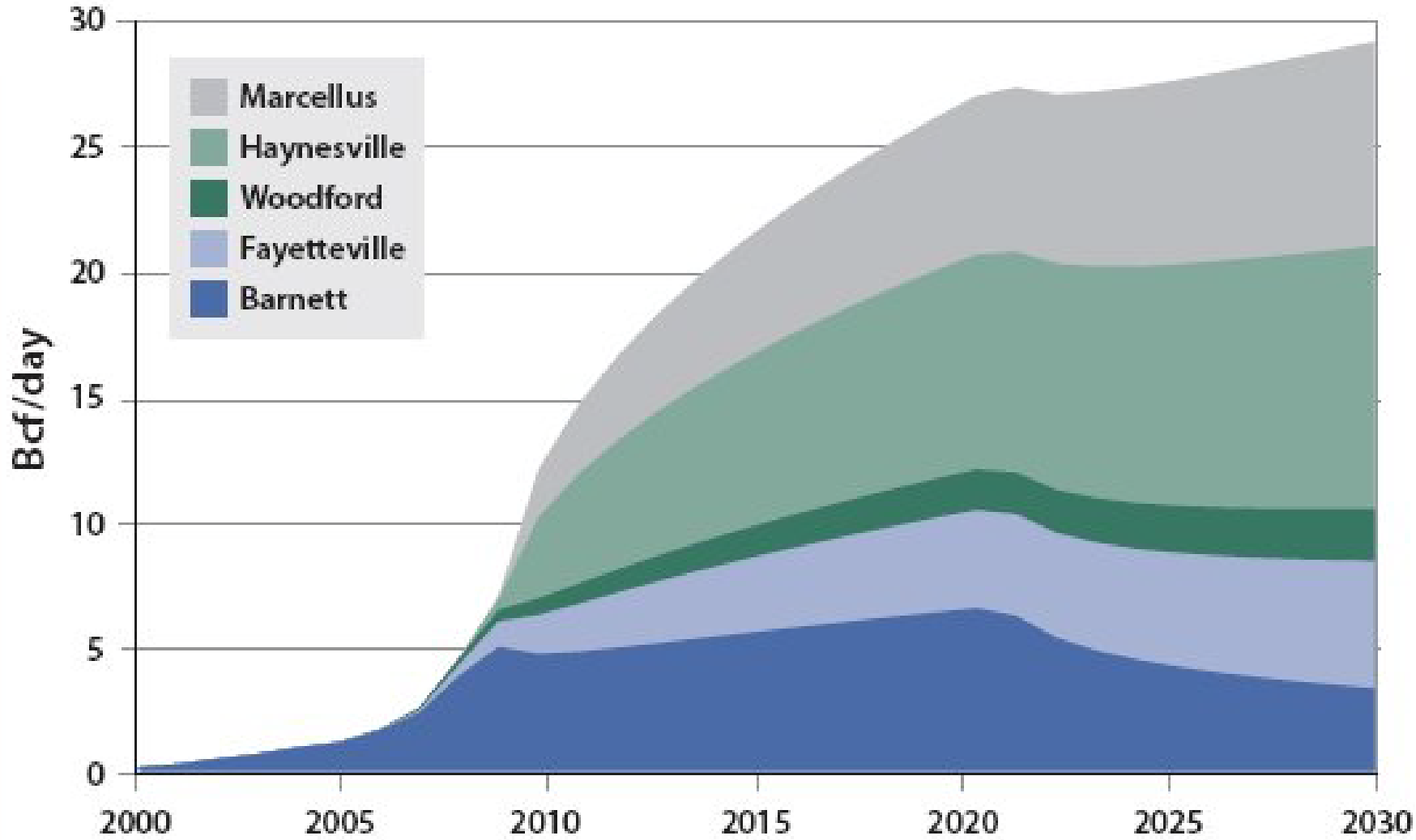


Figure 2.17 Potential Production Rate that Could Be Delivered by the Major U.S. Shale Plays up to 2030 — Given 2010 Drilling Rates and Mean Resource Estimates



Source: MIT analysis

Significance of Fracing on Price

Natural gas glut



Natural gas futures price, dollars per million
BTU, 6 months

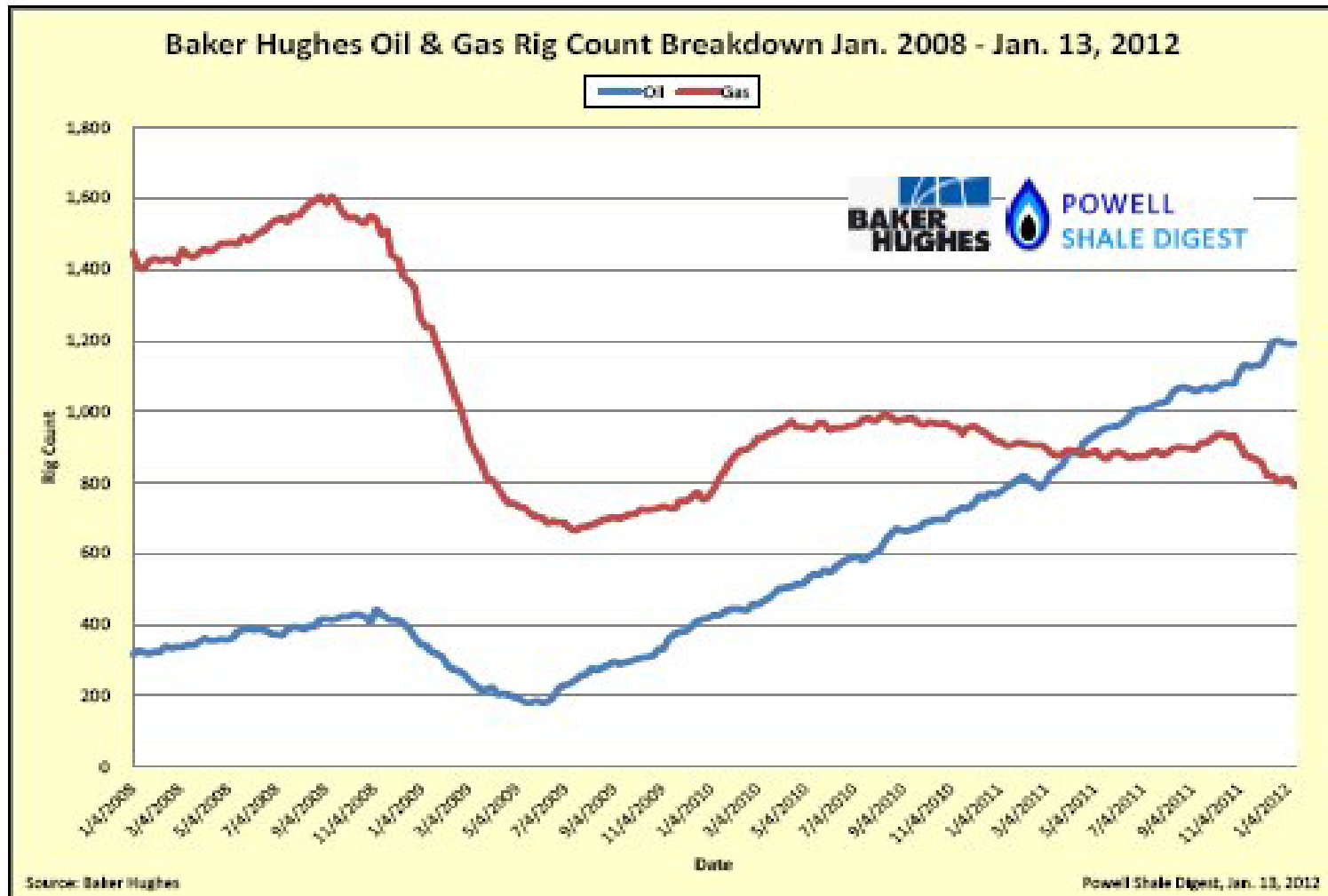
Predictions Resulting from Gas Glut

- Gas being shut in
- Decline of Wind, Solar, Nuclear Projects
- Return to Long-Term Gas Contracts
- Increased use of natural gas as transportation fuel
- U.S. as exporter of LNG

Good Year for E&P/M&A Activity

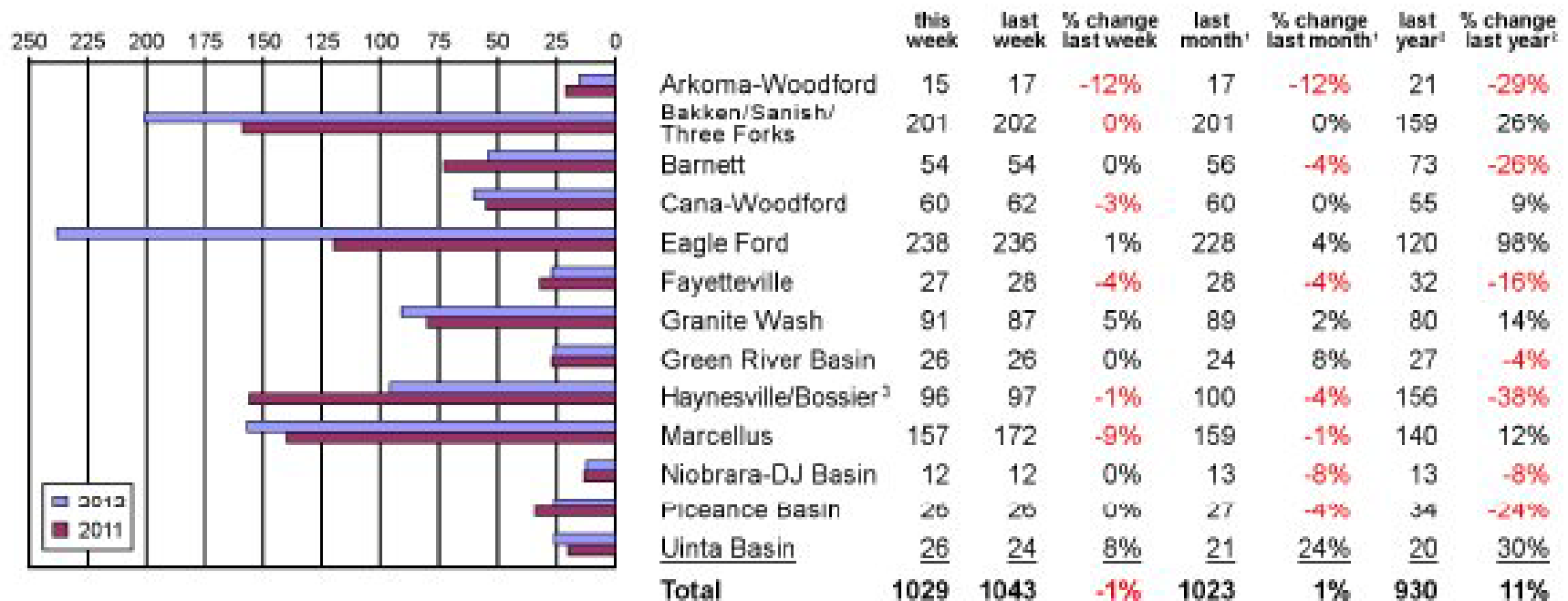
- BHP Billiton acquires Petrohawk for \$15.1 billion
- Kinder Morgan acquires El Paso Corp. for \$7.2 billion
- BHP Billiton acquires Chesapeake's Fayetteville Shale production for \$4.75 billion
- Statoil acquires Brigham Exploration for \$4.7 billion
- Marathon acquires Hilcorp's Marcellus acreage for \$3.5 billion

Rigs Moving to Oil Plays



Rig Counts in US Shale Plays

NGI's Shale Daily Unconventional Rig Count
for the week ending January 6, 2012

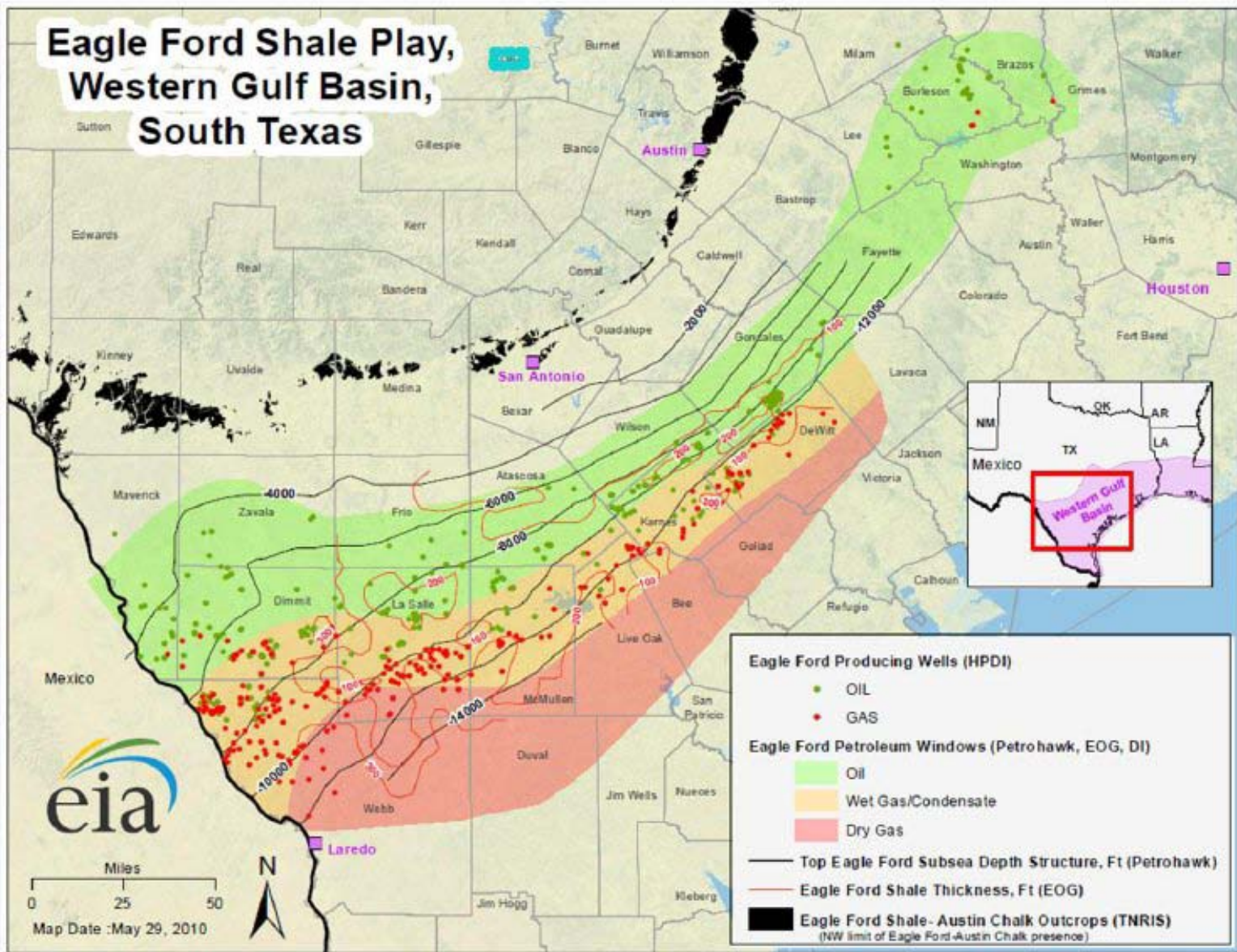


Notes: ¹Last month based on data for week ending Dec. 9, 2011. ²Last year based on data for week ending Jan. 7, 2011. Shale Basin rig counts compiled by NGI's Shale Daily based on underlying rig count data used with permission of South Bits, a Schlumberger company. Figures include oil and gas rigs in the respective unconventional resource plays and may contain rigs that are targeting conventional formations. ³Haynesville/Bossier also includes rigs targeting the Cotton Valley tight sands formation.

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The Booming Eagle Ford

- 1,231 EF Wells in 25 Counties
- Production to date: 37 mm bbls, 311 Bcf
- 238 rigs running

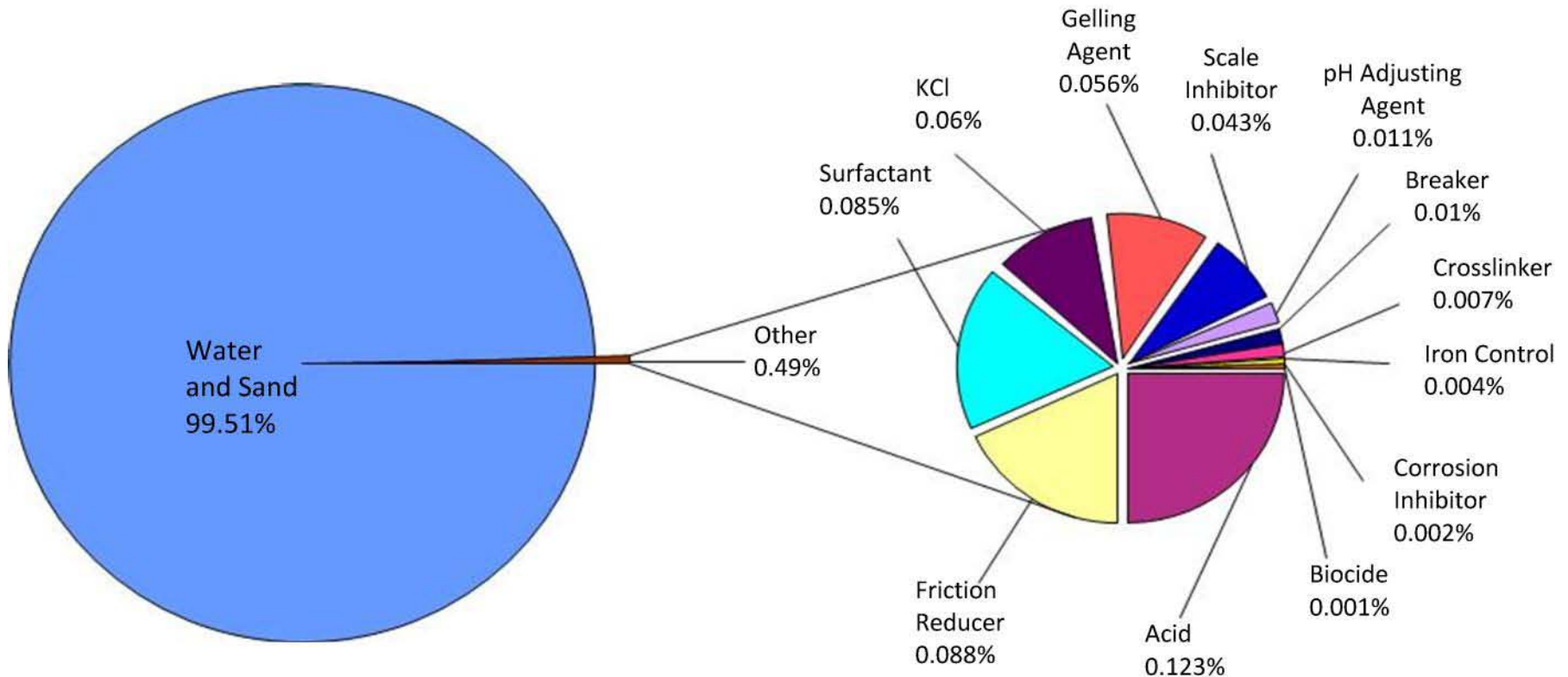


Hydraulic Fracturing Fluids and Their Contents

- Between 0.5% and 2.0% of hydraulic fracturing fluid is comprised of chemical additives. The remaining 98% to 99.5% is comprised of water.
- A recent study by the US House of Representatives published a list of 750 chemicals and other components added to hydraulic fracturing fluids.* Despite this high number, a typical fracture treatment involves very low concentrations of only 3 to 12 chemicals.
- The situation is analogous to Granny's famous Coconut Cream Pie recipe: While her cupboards reveal a variety of diverse spices at her ready, only a select few are chosen depending on the precise characteristics of the cake desired and the conditions under which it is made.

* *Chemicals Used in Hydraulic Fracturing*, US House of Representatives Committee on Energy and Commerce (April 2011).

Volumetric Composition of Hydraulic Fracturing Fluid



Disclosure of Hydraulic Fracturing Fluid Recipe

- The recipe of fracturing fluid varies to meet the specific needs of each formation and takes into consideration the engineering, geological, and environmental characteristics in the area. There is no one-size-fits-all recipe.
- The precise composition and volume of chemical additives in fracturing fluid are proprietary and trade secrets.
- Under Texas statute, the supplier or the service company of a fracturing operation must disclose information regarding the chemicals added to the fracturing fluid, provided that the chemicals are not claimed as a trade secret.*

• Like Granny's Coconut Cream Pie recipe, you know what's in it, but she won't give you the recipe.

* Texas Administrative Code, Tit. 16, Pt. 1, Ch. 3, Rule §3.29 (Hydraulic Fracturing Chemical Disclosure Requirements)

FracFocus.Org

FracFocus
Chemical Disclosure Registry

HYDRAULIC FRACTURING HOW IT WORKS **GROUNDWATER** PROTECTION **CHEMICAL** USE **REGULATIONS** BY STATE **FIND A WELL** BY STATE **FREQUENT** QUESTIONS

WELCOME

Welcome to FracFocus, the hydraulic fracturing chemical registry website. This website is a joint project of the Ground Water Protection Council and the Interstate Oil and Gas Compact Commission.

On this site you can search for information about the chemicals used in the hydraulic fracturing of oil and gas wells. You will also find educational materials designed to help you put this information in perspective.

[LEARN MORE >](#)

[Welcome](#) [Hydraulic Fracturing](#) [Casing & Cement](#) [State Regulations](#) [Chemical Use](#)

Looking for information about a well site near you?

[FIND A WELL](#)

Search for nearby well sites that have been hydraulically fractured to see what chemicals were used in the process.

FAQs

◀ 1/3 ▶

Q. Do states conduct ongoing testing of water wells and oil and gas well construction?

A. It depends on the state. When it comes to water wells, many states have water well construction standards but not routine testing requirements. As regards the construction of oil and gas wells, all states have well construction requirements. These can be reviewed by going to the [Regulations by State](#) page, selecting the state in question and then selecting View Regulations.

Groundwater Protection: Priority Number One

Is groundwater protected?

Oil and natural gas producers have stringent requirements for how wells must be completed. The genesis of these requirements is water safety.

Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date:	4/24/2011
State:	Louisiana
County:	De Soto
API Number:	1703125178
Operator Name:	Shell Western E&P
Well Name and Number:	Advanced L&T 11-1H
Longitude:	-93.67542344
Latitude:	32.03593258
Long/Lat Projection:	NAD83
Production Type:	Gas
True Vertical Depth (TVD):	12,130
Total Water Volume (gal)*:	7,396,938

Hydraulic Fracturing Fluid Composition

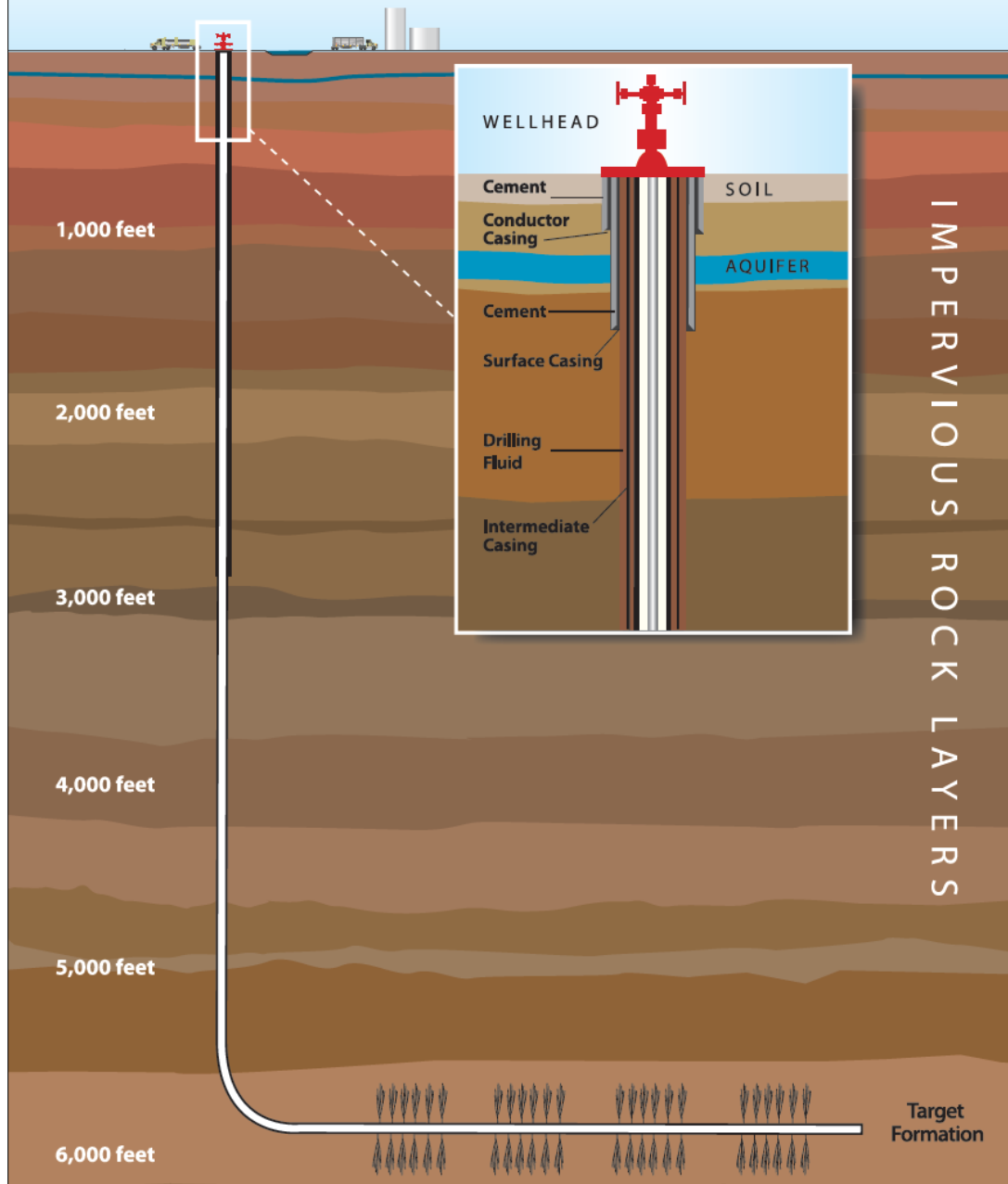
Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Fresh Water	Operator				100.00%	90.65978%	Density = 8.330
SAND - COMMON WHITE	Halliburton	Proppant	Crystalline silica, quartz	14808-60-7	100.00%	3.31738%	
SAND - PREMIUM WHITE	Halliburton	Proppant	Crystalline silica, quartz	14808-60-7	100.00%	4.48342%	
PRC SAND PREMIUM	Halliburton	Proppant	Crystalline silica, quartz	14808-60-7	100.00%	1.05025%	
			Hexamethylenetetramine	1009-7-0	2.00%	0.02100%	
			Phenol / formaldehyde resin	900303-35-4	5.00%	0.05251%	
FR-86	Halliburton	Friction Reducer	Hydrotreated light petroleum distillate	84742-47-8	30.00%	0.02993%	
BE-9	Halliburton	Biocide	Tributyl tetradecyl phosphonium chloride	81741-28-8	10.00%	0.00552%	
Clayfix 3	Halliburton	Clay Control	Sodium chloride	7847-14-5	30.00%	0.07959%	
VICON NF BREAKER	Halliburton	Breaker	Chlorous acid, sodium salt	7758-19-2	10.00%	0.00109%	
			Sodium chloride	7847-14-5	30.00%	0.00328%	
LGC-38 UC	Halliburton	Gelling Agent	Guar gum	9000-30-0	60.00%	0.03264%	
			Naphtha, hydrotreated heavy	84742-48-9	60.00%	0.03264%	
SP BREAKER	Halliburton	Breaker	Sodium persulfate	7775-27-1	100.00%	0.00004%	
OptiKleen-WF™	Halliburton	Surfactant	Sodium perborate tetrahydrate	10488-00-7	100.00%	0.00782%	

* Total Water Volume sources may include fresh water, produced water, and/or recycled water

** Information is based on the maximum potential for concentration and thus the total may be over 100%

All component information listed was obtained from the supplier's Material Safety Data Sheets (MSDS). As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of the MSDS should be directed to the supplier who provided it. The Occupational Safety and Health Administration's (OSHA) regulations govern the criteria for the disclosure of this information. Please note that Federal Law protects 'proprietary', 'trade secret', and 'confidential business information' and the criteria for how this information is reported on an MSDS is subject to 29 CFR 1910.1200(i) and Appendix D.

Groundwater Protection through Proper Well Construction



Examples of Vertical Separation Freshwater to Producing Formation

- **Barnett**
 - Freshwater Depth: 1,200
 - Formation Depth: 6,500–8,500 ft.
- **Haynesville**
 - Freshwater Depth: 400
 - Formation Depth: 10,500–13,500
- **Marcellus (PA)**
 - Freshwater Depth: 850
 - Formation Depth: 4,000–8,500

Risks to Surface Water: Flowback

- After fracing, a portion of frac fluids are produced back to the surface.
 - Amount of frac fluid recovered as flowback varies from 25% to 75%.
 - Flowback rate in first few days can exceed 100,000 gallons per day.
 - Will drop to ~ 50 gallons per day over time.
- Flowback fluids may include high TDS values, concentrations of major ions (e.g. barium, bromide, calcium, iron), radionuclides, VOCs, and other natural occurring elements.

Handling/Disposal of Flowback

- Flowback and produced water are held in storage tanks and water impoundment pits prior to and during treatment, recycling, and disposal.
- Underground injection is primary method for disposal for flowback and produced water.
 - Concerns regarding injection capacity and cost of trucking wastewater to injection site.
- Potential for use of publicly owned treatment works (POTW) or commercial treatment facilities if in populated areas.
 - POTWs often not designed to treat fracing wastewaters.
- Releases, leaks, and/or spills involving storage and transportation of flowback and produced water could contaminate shallow drinking water aquifers and surface water.
- Interest in reuse, with treatment, is growing. BEG estimates 6% of water in Barnett Shale is recycled.

Average Frac Water Use (Gal/well)

- Barnett 3.0 – 4.0M
- Marcellus (PA) 3.8M
- Haynesville 5.2M
- Eagle Ford 5.3M

Projected Fracing Water Use

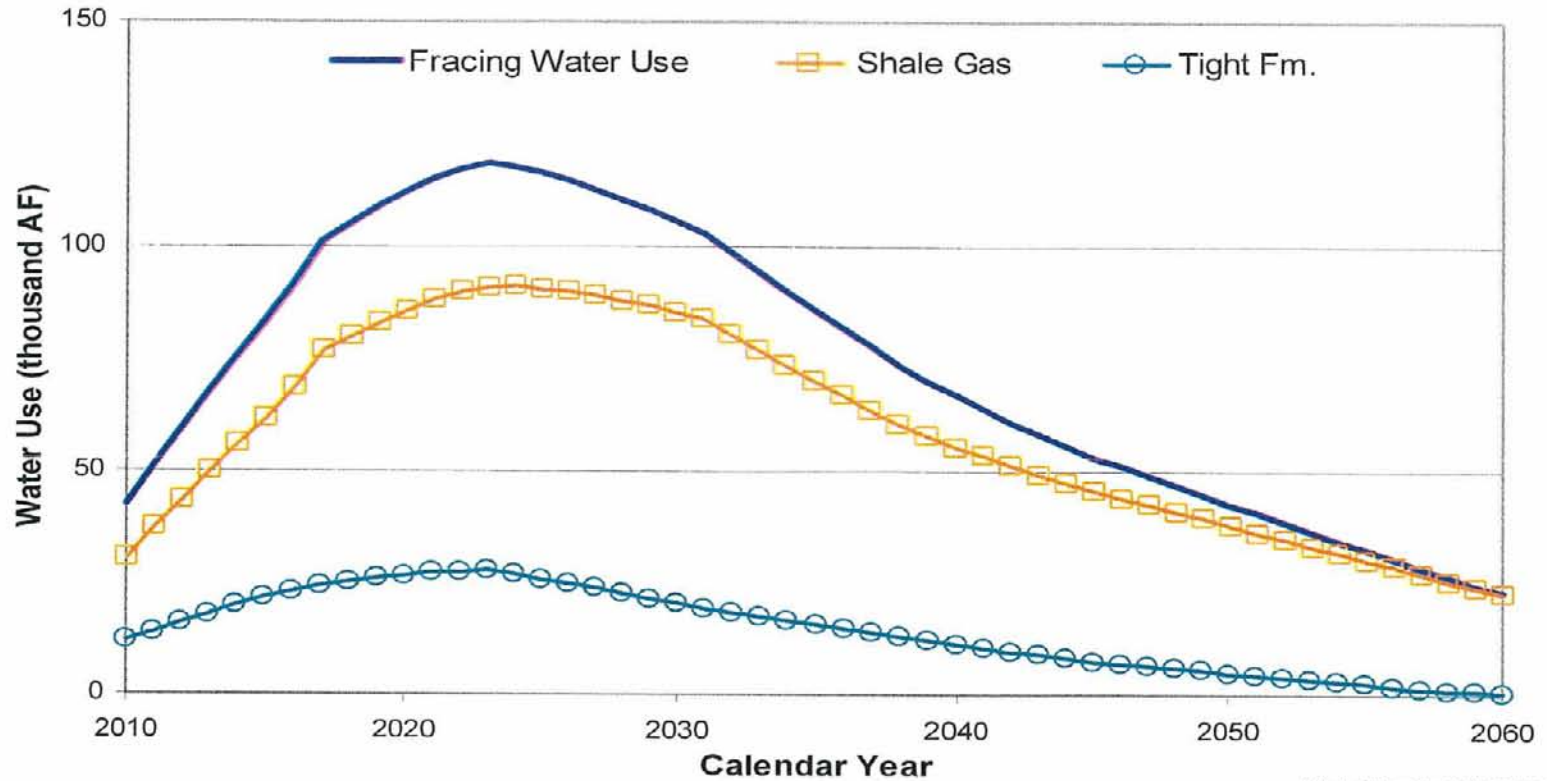


Figure 119. Projected state fracing water use

MiningWaterUse2010-2060_2.xls

Table 2.6 Comparative Water Usage in Major Shale Plays

Play	Public Supply	Industrial/ Mining	Irrigation	Livestock	Shale Gas	Total Water Use (Bbbls/yr)
Barnett TX	82.7%	3.7%	6.3%	2.3%	0.4%	11.1
Fayetteville AR	2.3%	33.3%	62.9%	0.3%	0.1%	31.9
Haynesville LA/TX	45.9%	13.5%	8.5%	4.0%	0.8%	2.1
Marcellus NY/PA/WV	12.0%	71.7%	0.1%	<0.1%	<0.1%	85.0

Source: ALL Consulting

Eagle Ford Play Fracing v. Agriculture Water Use

“Mr. Brownlow, who has a Ph.D. in geochemistry, says it takes 407 million gallons to irrigate 640 acres and grow about \$200,000 worth of corn on the arid land. The same amount of water, he says, could be used to frack enough wells to generate \$2.5 billion worth of oil. ‘No water, no frack, no wealth,’ says Mr. Brownlow, who has leased his cattle ranch for oil exploration.”

– WSJ, Dec. 6, 2011

Quoting Darrell Brownlow, Ph.D.

Property/Ownership Issues

Groundwater Ownership and Reuse

- Absent an express conveyance or reservation to the contrary, the courts have consistently held water is a part of the surface estate.*
- However, a mineral lessee has the right to take as much water as is reasonably necessary to enable lessee to carry out the development and production operations under the lease.**
- The court observed that the leasehold estate is the dominant estate and has an implied grant of free use of such part and so much of the premises as is reasonably necessary to effectuate the purposes of the lease.**
- To date, there is little guidance regarding the sale of fracking effluent to third parties or for off-lease operations. It is advisable to obtain the consent of the surface owner.

* *Sun Oil Co. v. Whitaker*, 483 S.W.2d 808 (Tex. 1972); *Fleming Foundation v. Texaco, Inc.*, 337 S.W.2d 846 (Tex.Civ.App.1960).

** *Sun Oil Co.*, 483 S.W.2d 808.

Groundwater Use Drilling Permit Exemption

Texas Water Code 36.117

- (b) A district may not require any permit issued by the district for:
- (2) the drilling of a water well used solely to supply water for a rig that is actively engaged in drilling or exploration operations for an oil or gas well permitted by the [RRC] . . . and the well is located on the same lease or field associated with the drilling rig . . .
- * * *
- (d) Notwithstanding Subsection (b), a district may require a well to be permitted by the district and to comply with all district rules if:
- (2) the purpose of a well exempted under Subsection (b)(2) is no longer solely to supply water for a rig that is actively engaged in drilling or exploration operations for an oil or gas well . . .

Regulatory Overview

Patchwork of Laws and Regulations

RRC Frac Fluid Disclosure Rule

EPA Hydraulic Fracturing Study

**Air Emissions
EPA Proposed
New Source
Performance
Standards**

**Municipal
Codes and
Ordinances**

Wastewater Disposal

- NPDES Permit (EPA)
- Land Application (RRC)
- Injection Well (RRC)
- MOA with TCEQ

Underground Injection

- Safe Drinking Water Act
- Underground Injection Control (UIC)

Common Law

- Subsurface Trespass
- Pollution
- Nuisance

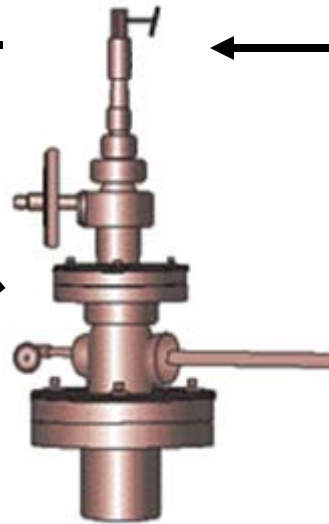
Storm water Run-Off
NPDES Permit (EPA)

Water Supply

- Ch 210 Re-use
- TWC § 36.117 (GW permit ex)
- TWC § 11.121 (mining use)

Railroad Commission

- Well spacing
- Drilling/casing
- Operation
- MOU with TCEQ



Federal SDWA Regulation

- Safe Drinking Water Act exempts fracking (except w/ diesel fuel) from regulation as “underground injection” by the Energy Policy Act of 2005. (42 U.S.C. 300h(d)(1)(B)(ii)).
 - Bills introduced in March 2011 to remove exemption and explicitly include fracking in SWDA (HR 1084, S 587).
 - Similar bills introduced in past (2009 – HR 2766).
- EPA Deputy Administrator Bob Perciasepe testified before Congress that using diesel in fracking requires an SDWA permit or is a violation.
- EPA sent letters to nine O&G companies requesting data on 350 wells that were frac’d, as part of its study of potential impacts on drinking water resources. Companies are cooperating to supply information.
- EPA plans to propose, 2014, technology-based water pretreatment standards for water going from shale gas (frac) wells to publicly owned treatment plants.

Other Federal Developments

- April 16, 2011:
 - Congressional report prepared by Waxman, Markey, and DeGette outlining chemicals used in fracking, including benzene, lead, and methanol.
 - Alleged use of 29 chemicals that are known or possible carcinogens.
- August 11, 2011:
 - Shale Gas Subcommittee of the Secretary of Energy Advisory Board releases 90-day report with preliminary recommendations for increasing fracking environmental safety while lauding importance of natural gas.
- October 31, 2011:
 - Interior Department announces it expects to issue new regulations for fracking on public lands in “a couple of months.”
- November 10, 2011:
 - Shale Gas Subcommittee releases second 90-day report on progress of implementing initial recommendations.
- February 3, 2012:
 - Department of Interior releases draft rules intended to govern fracking on public lands, including chemical disclosure requirements

Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources

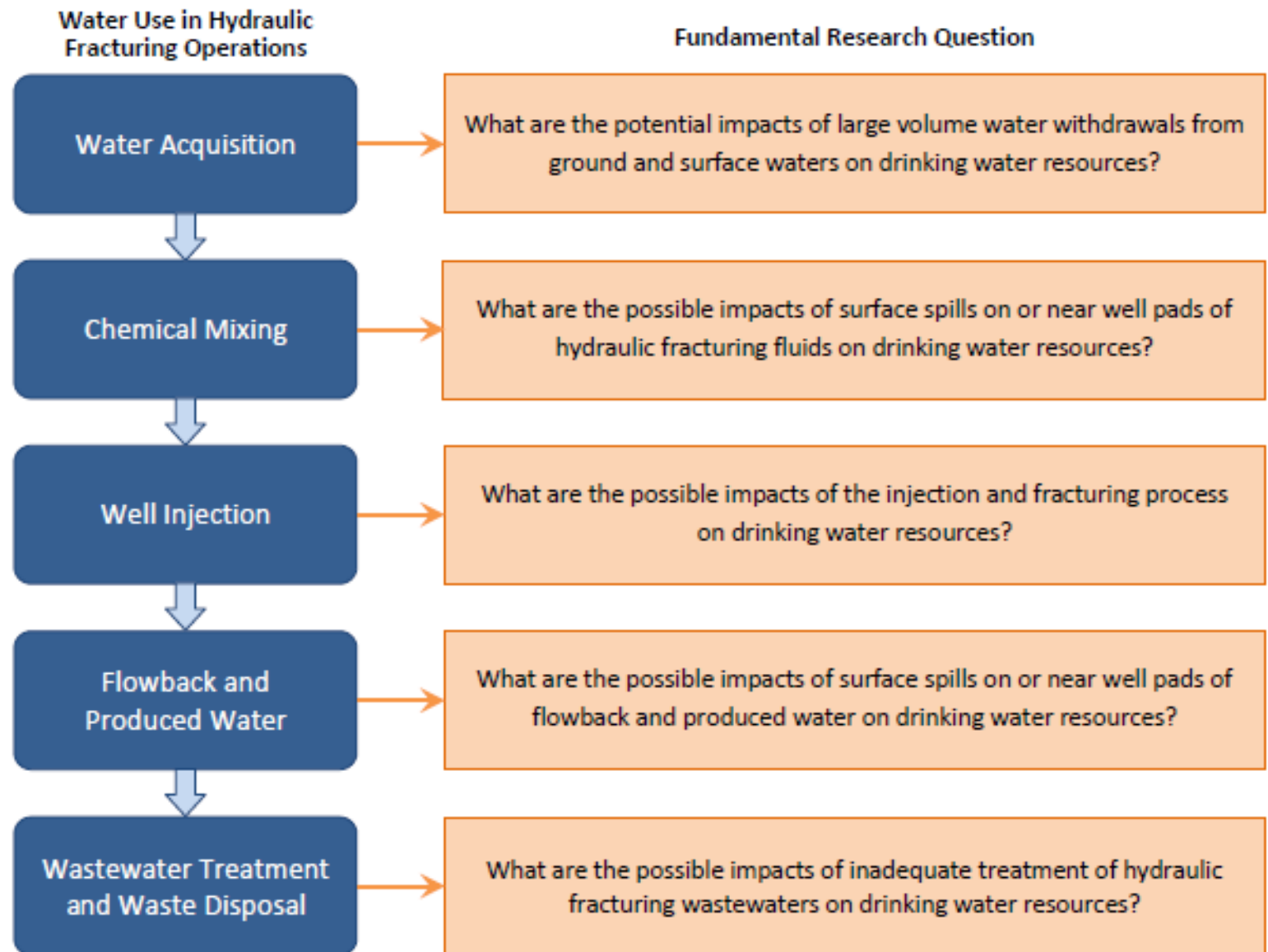


FIGURE 1. FUNDAMENTAL RESEARCH QUESTIONS POSED FOR EACH IDENTIFIED STAGE

EPA Hydraulic Fracturing Study Plan

- November 3, 2011: EPA Final Hydraulic Fracturing Study Plan
- Will examine “life cycle” of fracing, specific focus on potential impact to drinking water resources.
- Study will analyze and research questions involving:
 - Water Acquisition; Chemical Mixing; Well Injection; Flowback and Produced Water; and Wastewater Treatment and Waste Disposal.
- Study will include:
 - Five retrospective case study locations: Bakken Shale, ND; Marcellus Shale, PA (2 locations); Raton Basin, CO; and Barnett Shale, TX
 - Two prospective cases study locations: Marcellus Shale, PA; Haynesville Shale, LA.
- Initial results expected in 2012, with 2014 report.
- In 2004, EPA conducted study finding that hydraulic fracturing in coal-bed methane wells pose little to no threat to underground drinking water.

EPA Fracing Report On Wyoming Water

- A draft finding by the EPA claims that it has detected compounds likely associated with hydraulic fracing chemicals in groundwater around natural gas operations in Pavillion, Wyoming.
- The EPA's findings have raised questions among many in the oil and gas industry regarding the EPA's data and methodology, particularly because the EPA failed to conclusively state whether hydraulic fracturing operations actually contributed to groundwater pollution.
- The EPA's report entitled "EPA Investigation of Ground Water Contamination near Pavillion, Wyoming " can be found at www.epa.gov/region8/superfund/wy/pavillion/EPA_Report_OnPavillion_Dec-8-2011.pdf.

DOE Recommendations

- <http://www.shalegas.energy.gov/>
- Improve public information about shale gas operations
- Improve communication among federal and state regulators
- Provide federal funding for STRONGER and GW Protection Council
- Finalize EPA rules on regulation of air emissions in E&P Sector
- Analyze greenhouse gas footprint of natural gas use
- Encourage companies to reduce air emissions
- Launch field studies on methane migration to groundwater
- Require disclosure of frac fluid chemicals
- Eliminate use of diesel fuel in fracking
- (Does not recommend federal regulation of fracking under CWA)

Texas Regulation

- Railroad Commission of Texas (RRC) has primary oversight authority for O&G wells, not Texas Commission on Environmental Quality (TCEQ).
- May 2009 RRC Chairman letter: “not…a single documented contamination case associated with hydraulic fracturing.”
- No specific regulation of Frac methods, but generally covered by RRC oil and gas rules.
- Bills filed in 2011 to increase fracing regulation died. (Except HB 3328, on disclosure)

Existing RRC Regulations

- Groundwater protection regulations include:
 - Rule 5** – Permit required for drilling and deepening of wells (does not specifically cover fracing operations).
 - Rule 8** – Groundwater protection and regulates storage and disposal of oil and gas wastes.
 - Rule 9** – Disposal wells for oil and gas waste.
 - Rule 13** – Establishes casing, cementing, drilling, and completion of well requirements.
 - Rule 46** – Requires permit for fluid injection for enhanced oil recovery but does NOT regulate fracing.

RRC Pit Rule

- Rule 8:

Basic sediment pit, brine pit, collecting pit, completion/workover pit, drilling fluid disposal pit, drilling fluid storage pit, emergency saltwater storage pit, flare pit, fresh makeup water pit, gas plant evaporation/ retention pit, mud circulation pit, reserve pit, saltwater disposal pit, skimming pit, washout pit, water condensate pit, brine mining pit

No landfarming without landowner consent

Burying of certain wastes permitted

Central water storage pits require permit

Rule also governs hauling of E&P waste

RRC Advisory Panel

- **Pipelines:**

- Placement of pipelines should avoid steep hillsides and watercourses where feasible.
- Pipeline routes should take advantage of road corridors to minimize surface disturbance.
- When clearing is necessary, the width disturbed should be kept to a minimum and topsoil material should be stockpiled to the side for replacement during reclamation, accelerating successful re-vegetation.
- Proximity to buildings or other facilities occupied or used by the public should be considered, with particular consideration given to homes.
- Unnecessary damage to trees and other vegetation should be avoided.
- After installation of a new line, all rights-of-way should be restored to conditions compatible with existing land use.

- **Roads:**

- Trucking companies partnering with the Texas Department of Public Safety to develop a program that would alert companies when their drivers receive moving violations or drivers license suspensions.
- Creation of road use agreements or trucking plans between operators and local authorities, including parameters such as:
 - Avoiding peak traffic hours, school bus hours, and community events.
 - Establishing overnight quiet periods.
 - ~~Ensuring adequate off road parking and delivery areas at all sites to avoid road blockage~~

Fracing Disclosure

RRC Rule 3.29

- **HB 3328:** Mandates Disclosure of Frac Fluids
 - Total volume of water used
 - Each chemical ingredient intentionally added
 - Trade name, description of function
 - Concentration of each chemical
 - Filed w/ RRC and posted on Internet
 - ~~Trade Secret Protection per Public Information Act~~

New York SGEIS

- New York State Department of Environmental Conservation (DEC) Supplemental Generic Environmental Impact Statement On Oil, Gas and Solution Mining (SGEIS)
- The DEC evaluated the environmental impact of natural gas drilling in New York and addressed permit conditions required for gas drilling in the Marcellus Shale and throughout the State.
- In response to more than 13,000 public comments and issues raised in connection with the draft SGEIS issued in September 2009, the DEC issued a revised draft SGEIS in September 2011. The revised SGEIS is found on the DEC website at www.dec.ny.gov/energy/75370.html.

University Studies

- Cornell debate over global warming effect of natural gas:
<http://online.wsj.com/article/AP5a65cb4fae304d60ba49904e3053e259.html>
- <http://www.springerlink.com/content/x001g12t2332462p/fulltext.pdf>
- MIT Study: The Future of Natural Gas:
<http://web.mit.edu/mitei/research/studies/report-natural-gas.pdf>
- Duke Study on methane in water wells in PA:
<http://www.pnas.org/content/early/2011/05/02/1100682108.full.pdf+html?sid=431611d5-61d3-4ba8-9ad7-c3a5d9955f20>
- University of Texas/Syracuse study:
http://energy.utexas.edu/index.php?option=com_content&view=article&id=50&Itemid=160

Relevant Litigation

Range Resources Case

EPA Emergency Order

- December 7, 2010: EPA issues emergency order under Section 1431 of SDWA alleging contamination of two domestic wells.
 - No notice, no opportunity for Range Resources to comment, and no presentation evidence.
 - Failing to comply with Emergency Order could lead to \$16,500 per violation per day penalty.
- Order requires Range Resources to:
 - Provide drinking water within 48 hours to affected residents;
 - Install explosivity meters within 48 hours; and
 - Identify gas flow, eliminate gas flow if possible, and remediate areas of aquifer that have been impacted.
- Alleges methane contamination, not fracing fluid specifically.
- Alleges that state and local authorities had not taken sufficient action to address endangerment.

Range Resources Litigation

- January 18, 2011: U.S. DOJ files complaint in Federal Court against Range Resources for not complying with EPA's emergency order.
- January 20, 2011: Range Appeals EPA order to 5th Cir.
- March 22, 2011: Following investigation, RRC Commissioners unanimously vote to clear Range Resources of EPA allegations. EPA did not testify at hearing.
- October 3, 2011: Oral argument held in Range's 5th Cir. Appeal.
- January 27, 2012: Lipsky state court suit against Range dismissed – pre-empted by RRC findings

Subsurface Trespass

- The most well know case on the matter is *Coastal Oil v. Garza Energy Trust*,* where adjacent landowners sought a trespass actions against a gas well operator for hydraulic fracturing operations where fractures from such operations extended across lease lines causing drainage from underneath the adjoining property.
- The Court held damages arising from such drainage did not support a claim for subsurface trespass because the rule of capture effectively barred recovery of a subsurface trespass claim.

* *Coastal Oil v. Garza Energy Trust*, 268 S.W.3d 1 (Tex. 2008).

Subsurface Trespass

- Whether fractures crossing lease lines can give rise to a claim for trespass remains essentially undecided. Justice Hecht avoids announcing whether such fractures constitute trespass, by observing actionable trespass requires injury, and plaintiffs' only claim of injury is precluded by the rule of capture.*
- Justice Willett concurring in the opinion goes further, stating: “[P]laintiffs alleging non-drainage injuries already have a ready theory: negligence. In such cases, where the rule of capture is inapposite, I would end definitively any lingering flirtation of Texas law with equating hydraulic fracturing with trespass. I would say categorically that a claim for “trespass-by-frac” is nonexistent in either drainage or non-drainage cases.”*

* *Coastal Oil v. Garza Energy Trust*, 268 S.W.3d 1 (Tex. 2008).

Subsurface Water Disposal Complications

- The Texas Supreme Court has not yet determined whether subsurface waste disposal can support a cause of action for subsurface trespass.
- In a Memorandum Opinion by the Texas Appellate Court, the Court observed that some measure of actual harm must accompany the migration of subsurface fluids in order for there to be an impairment of the existing rights in the subsurface of an adjacent land owner.*
- However, a permit granted by an agency does not shield the permit holder from tort liability for actions arising out of the use of the permit. This is consistent with the language of the Injection Well Act and Texas Administrative Code governing the TCEQ.**

* *FLP Farming, Ltd. v. Texas Natural Resource Conservation Commission*, 2003 WL 247183 (Tex. App.-Austin 2003).

** *FPL v. Environmental Processing Systems*, 351 S.W.3d 306 (Tex. 2011).

Conclusion and Regulatory Forecast

- Broad disclosure of fracking fluids and additives
 - Restrictions on use of certain additives
 - EPA regulation of diesel use
 - Restrictions on methods of disposal of flowback
 - Enhanced enforcement, site inspections
 - Voluntary efforts to reduce toxicity of additives
-
- More water reuse

QUESTIONS



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