Common Aspects of State Regulation of Hydraulic Fracturing

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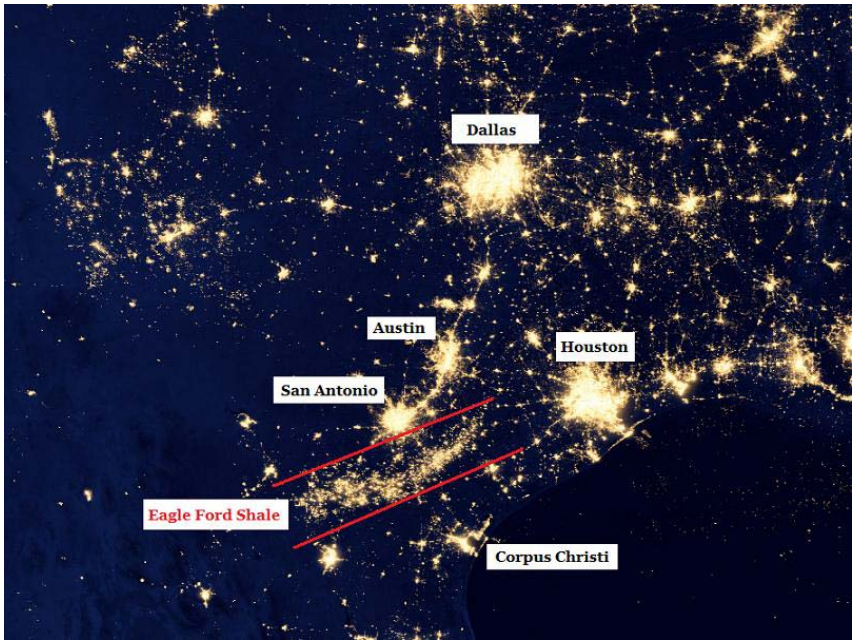
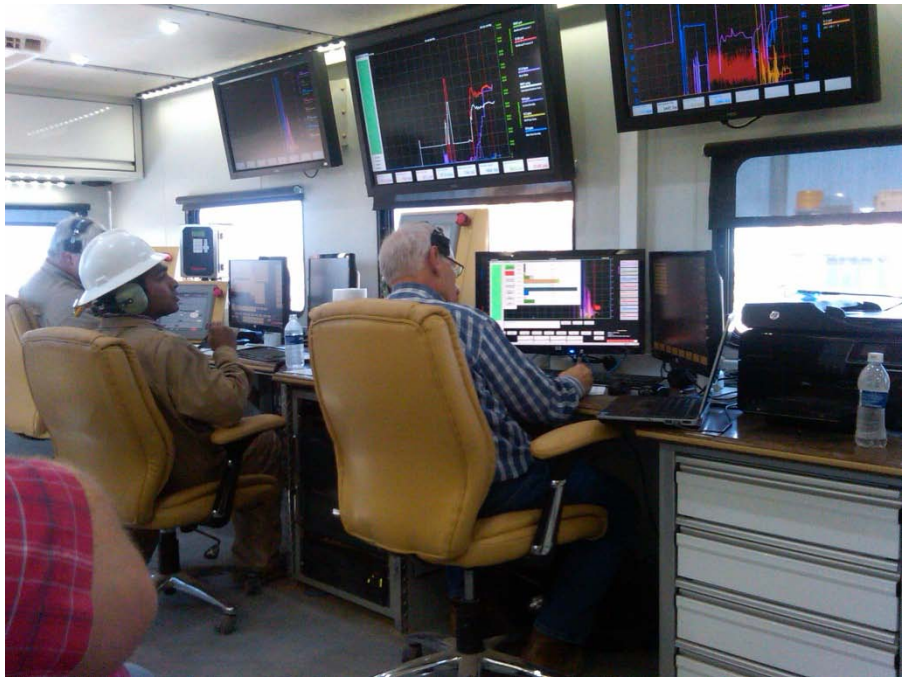


State Fracing Regulation

- Is fracing allowed in the first place?
- If so, what are the most common state laws:
  - Control of acquisition/use of water
  - Well completion requirements
  - Disclosure of fracing fluid ingredients
  - Flowback water disposal requirements
- Let's look at examples of these controls from some states!



Frac operation in Pennsylvania
Photograph: Chris Kulander

Control of Acquisition/Use of Water for Fracing

Texas: Texas Commission on Environmental Quality (TCEQ), TX's state agency governing surface water use to address water use during drought. Rules recently :

- **"Drought" and "emergency shortage of water" to be defined.**
- **Stipulate under what conditions a water right can be altered or suspended.**
- **Maximum period? Conditions to end alteration/suspension?**
- ***TCEQ Director could suspend or adjust a surface water right***
- ***Water right holders now required to maintain monthly water use information to be given to TCEQ when requested during "drought" conditions***

Texas—Groundwater Management Districts

Districts control groundwater use!

Water Code exempts oil & gas drilling from most rules, such as permitting, enacted by groundwater districts

Conservancy districts are now distinguishing "drilling or exploration operations" from fracing operations, and may require permits for the second type of use—could mean delays!

Districts and cities are moving forward with regulation and curtailment of use of groundwater for fracing operations.

"Fracwater pit" near Midland, TX

Completion Requirements - Ohio

Well Completion Report (WCR) required!

- type and volume of fluid used to stimulate the reservoir of the well;
- reservoir breakdown pressure;
- methods used for the containment of fluids recovered from the fracturing of the well;
- methods used for the containment of fluids when swabbing the well;
  - the average pumping rate of well; and
  - name of fracing contractor

Disclosure of Fracing Fluid Ingredients

Texas: Start of 2011—no specific regulations

May 2011: legislature passed fracing ingredient disclosure law.[1]

- Complete online form on *FracFocus.org*
  - Enter volume of water used and chemical ingredients
  - Trade secrets need not be disclosed—*but* non-disclosure may be challenged by landowners & neighbors
  - Requires means to get info (including trade secrets) to public health professionals & emergency responders

[1] H.B. 3328, 82nd Leg., R.S. (Tex. 2011) *signed by Governor Rick Perry in June*

FracFocus.org

Public clearinghouse of fracing info on a well-by-well basis. Started on April 11, 2011 by GPC & IOGCC:

- Contains general information about fracing, drilling, casing & cementing methods, treatment & chemical use
- Contains cursory explanation of state regulation of hydraulic fracturing
- Well site information voluntarily provided by participating oil and natural gas operators.
- Wells hydraulically fractured after January 1, 2011 to be added to the database over time.

Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date	8/25/2011
State:	Kansas
County:	Haskell
API Number:	15-081-21951
Operator Name:	Oxy
Well Name and Number:	Williams I-3
Longitude:	-100.962907
Latitude:	37.452286
Long/Lat Projection:	NAD27
Production Type:	Gas
True Vertical Depth (TVD):	5,316
Total Water Volume (gal)*:	20,370

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
Plexgel 907L-EB	Chemplex	Viscosifier for water	Distillate, petroleum, hydrotreated light	64742-47-8	0-60%	0-.0125%	
			Propylene Pentamer	15220-87-8	0-60%	0-.0125%	
			C-11 to C-14 n-alkanes, mixed	1120-21-4,112-4-3	0-60%	0-.0125%	
				629-50-5, 629-59-4	0-60%	0-.0125%	
Plexbor 101	Chemplex	Oil Field Crosslinker	Potassium Metaborate	13709-94-9	15-30%	0-.025%	
			Potassium Hydroxide	1310-58-3	1-5%	0-.0015%	
			Ethylene Glycol	107-21-1	10.00%	0-.0075%	
Plexgel Breaker 10L	Chemplex	Enzyme Breaker	No Hazardous Materials	N/A			
Plexsurf 210E	Chemplex	Flowback Aid	Methyl Alcohol	67-56-1	30.00%	0-.003%	
			Alcohol Alkoxylate	N/A	10-20%	0-.001%	
			Ethyleneglycol Monobutyl Ether	111-76-2	5.00%	0-.0002%	
Plexbreak 134	Chemplex	Non Emulsifier	Isopropyl Alcohol	67-63-0	15-20%	0-.001%	
Ammonium Persulfate	Chemplex	Breaker	Ammonium Persulfate	7727-54-0	>98%	0-.002%	
Plexgel Breaker HT	Chemplex	Encapsulated Breaker	Ammonium Persulfate	7727-54-0	80-90%	0-.098%	
AMA 35DP	Chemplex	Treat Frac Water	Dazomet	533-74-4	98.00%	0-.000051%	

* 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.

Example of frac fluid disclosure on FracFocus

What FracFocus Requires

- Well information
  (lat. & long, API # etc.)
- Chemical trade name
  (“Plexbreak 134”)
- Supplier
  (“Chemplex”)
- Purpose
  (“Flowback Aid”)
  (“Breaker”)
- Ingredients
  (“Potassium Hydroxide” *et al*.)
- Chemical Abstract Number
- Maximum Ingredient Concentration

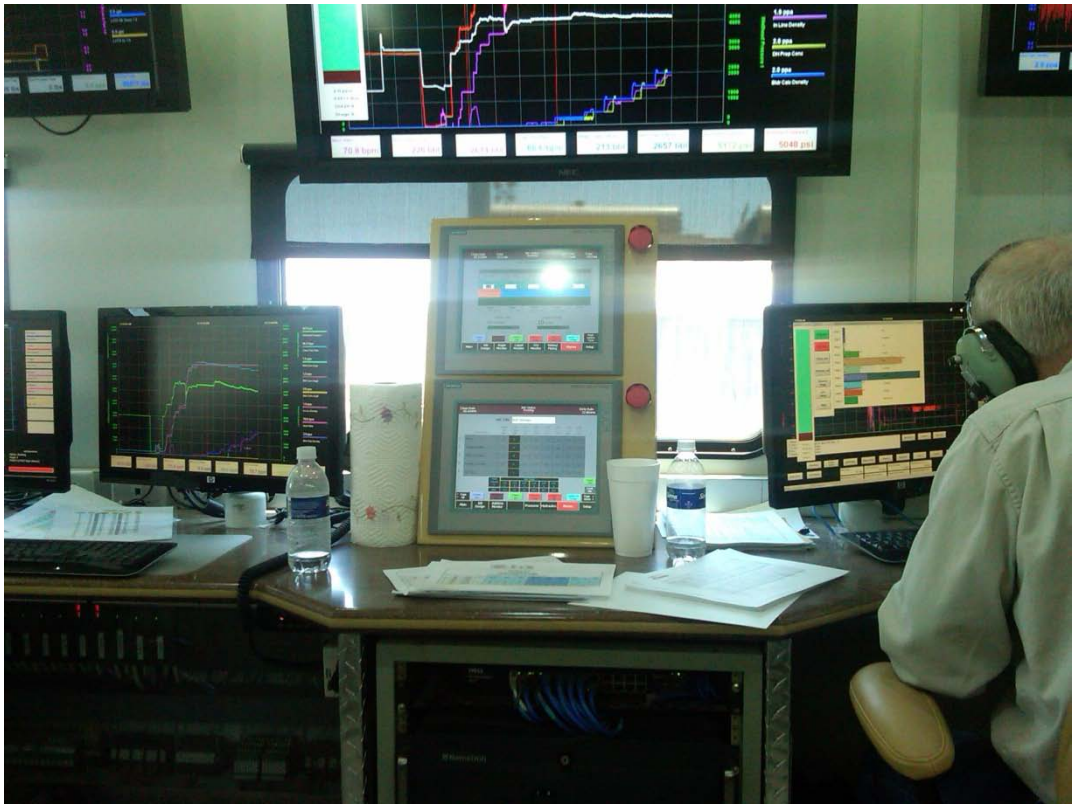
Frac operation in Texas
Photograph by: Chris Kulander

Flowback Water Disposal Requirements—West Virginia:

Operators of Class II wells in WV are required to permanently dispose of the wastewater from fracing

Governor's order prohibits land application of flowback, or disposal of flowback into publically-owned wastewater treatment plants

- most of the fracing fluid is ultimately disposed by re-injecting it underground per a UIC permit.



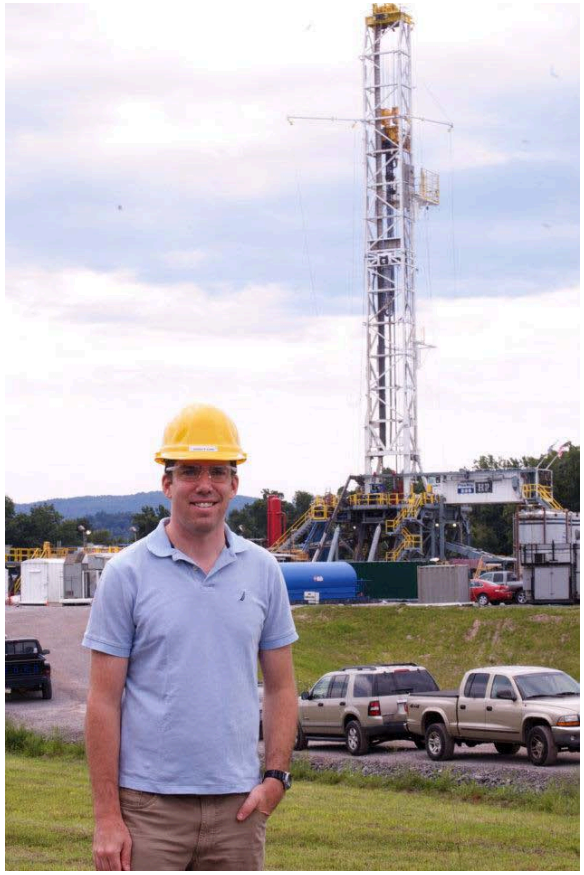
Frac operation in West Virginia
Photograph by: Chris Kulander

Flowback Water Disposal Requirements—West Virginia:

"Hydrofracturing Reporting form" required with:

(1) the amount and location from which water was withdrawn;
(2) the amount injected into the well;
(3) the well's location;
(4) amount of flow-back water recovered;
(5) the method and location of disposal, treatment, or recycling of flowback water.

Code requires protective liners in all pits and impoundments used for holding fracing wastewater.



Frac operation in West Virginia
Photograph by: Shane Robinson

Model Regulatory Scheme

What might it include?

- Control of acquisition/use of water
- Casing, tubing and cementing requirements
- Disclosure of fracing fluid ingredients
- Flowback water disposal requirements

Considerations:

- Model regulatory scheme may invite federal control
- States do not fall easily into “one size fits all”
- States seem prepared to adjust quickly

Thank you!

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