

EIGHTH ANNUAL

HYDRAULIC FRACTURING

SYMPOSIUM

WEDNESDAY, OCTOBER 3, 2018

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Today's Agenda



I. Shale & Fracking Tracker

- Jay Rothrock, Senior Associate, Vinson & Elkins

II. Regulatory

- Larry Nettles, Partner, Vinson & Elkins

III. Litigation

- Guy Lipe, Partner, Vinson & Elkins

IV. Safety/OSHA

- Chris Bacon, Counsel, Vinson & Elkins

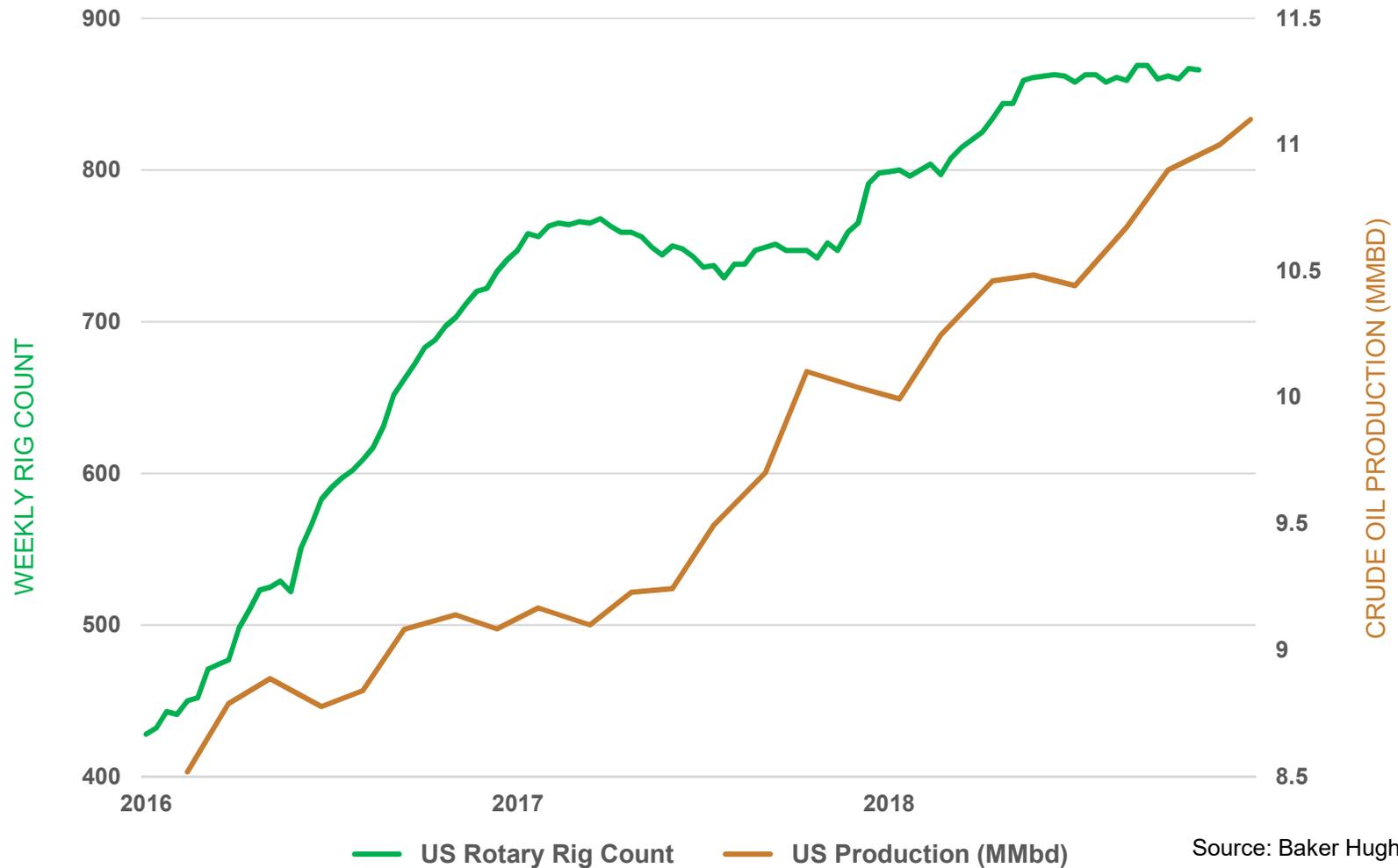
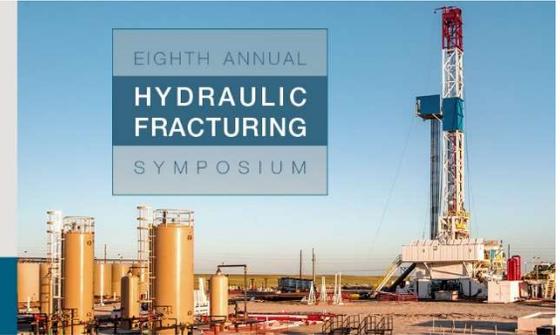
V. Market Update

- John B. Connally, Partner, Vinson & Elkins

VI. Q&A

U.S. Rig Count & Production Trends

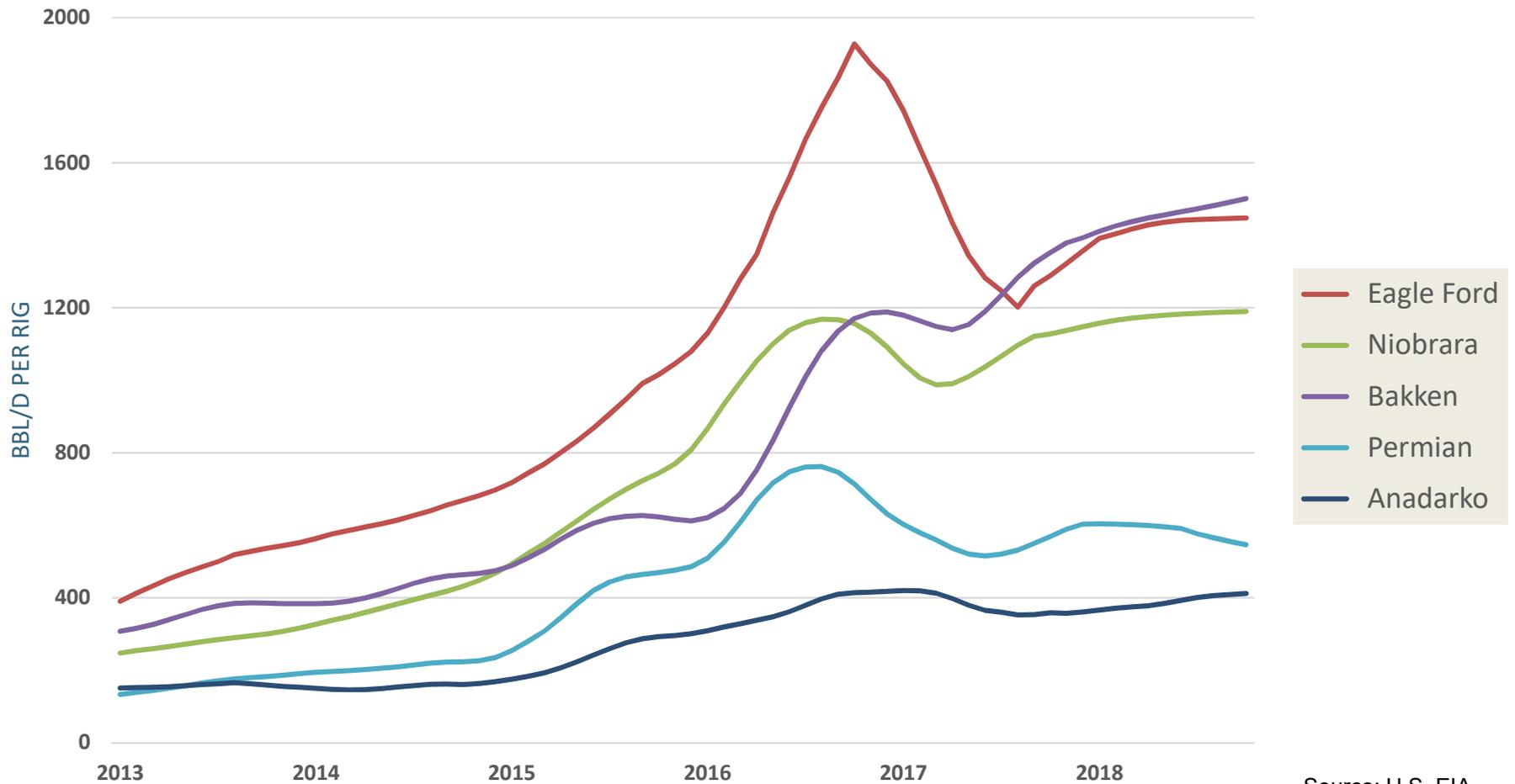
September 2016 – September 2018



Source: Baker Hughes; EIA

Oil Production at Select U.S. Shale Fields

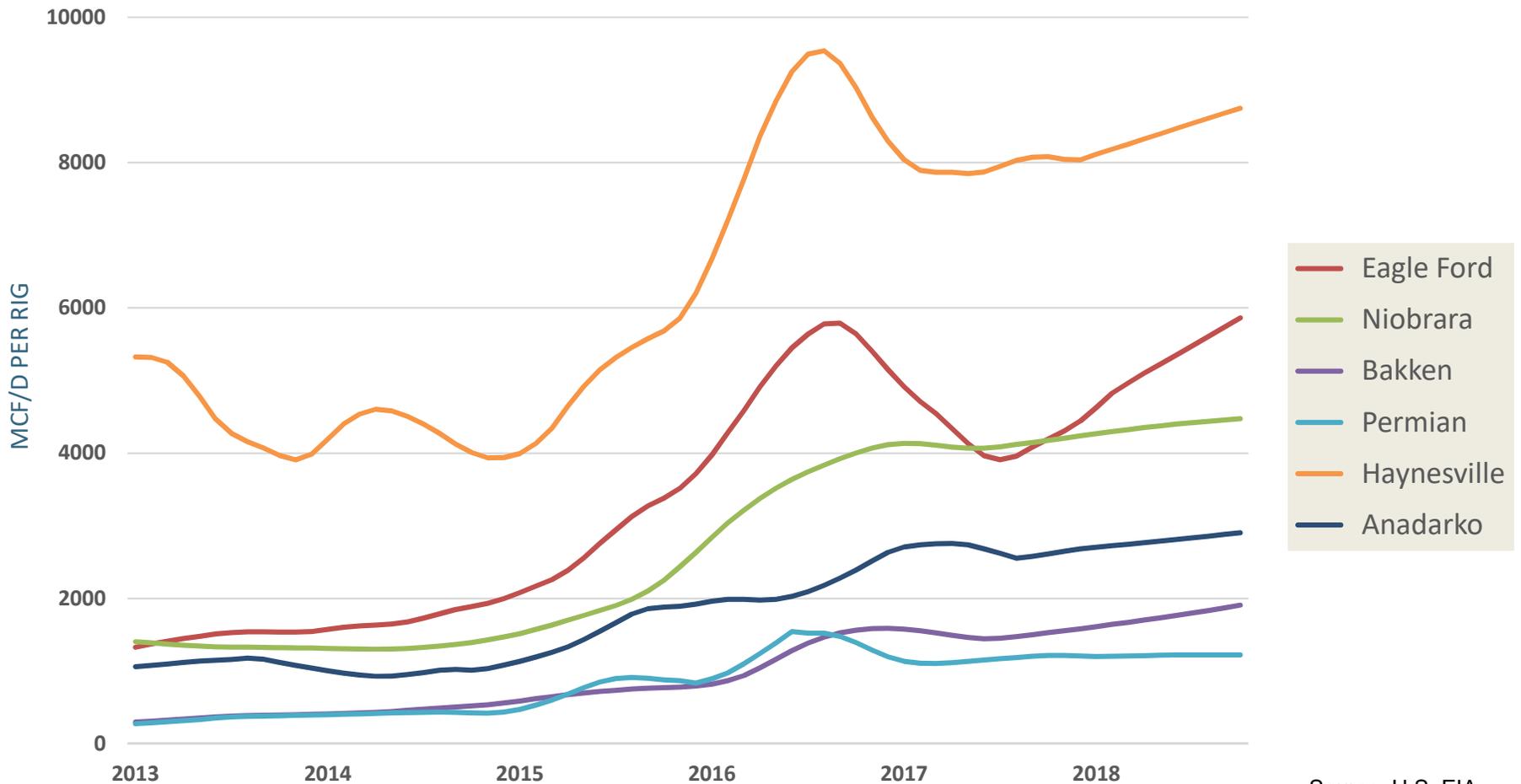
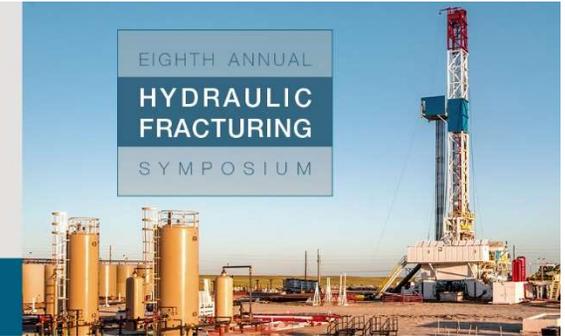
January 2013 – September 2018



Source: U.S. EIA

Gas Production at Select U.S. Shale Fields

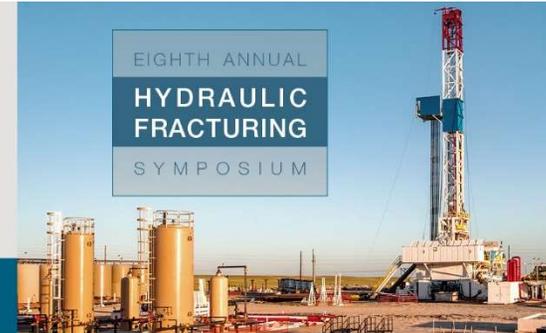
January 2013 – September 2018



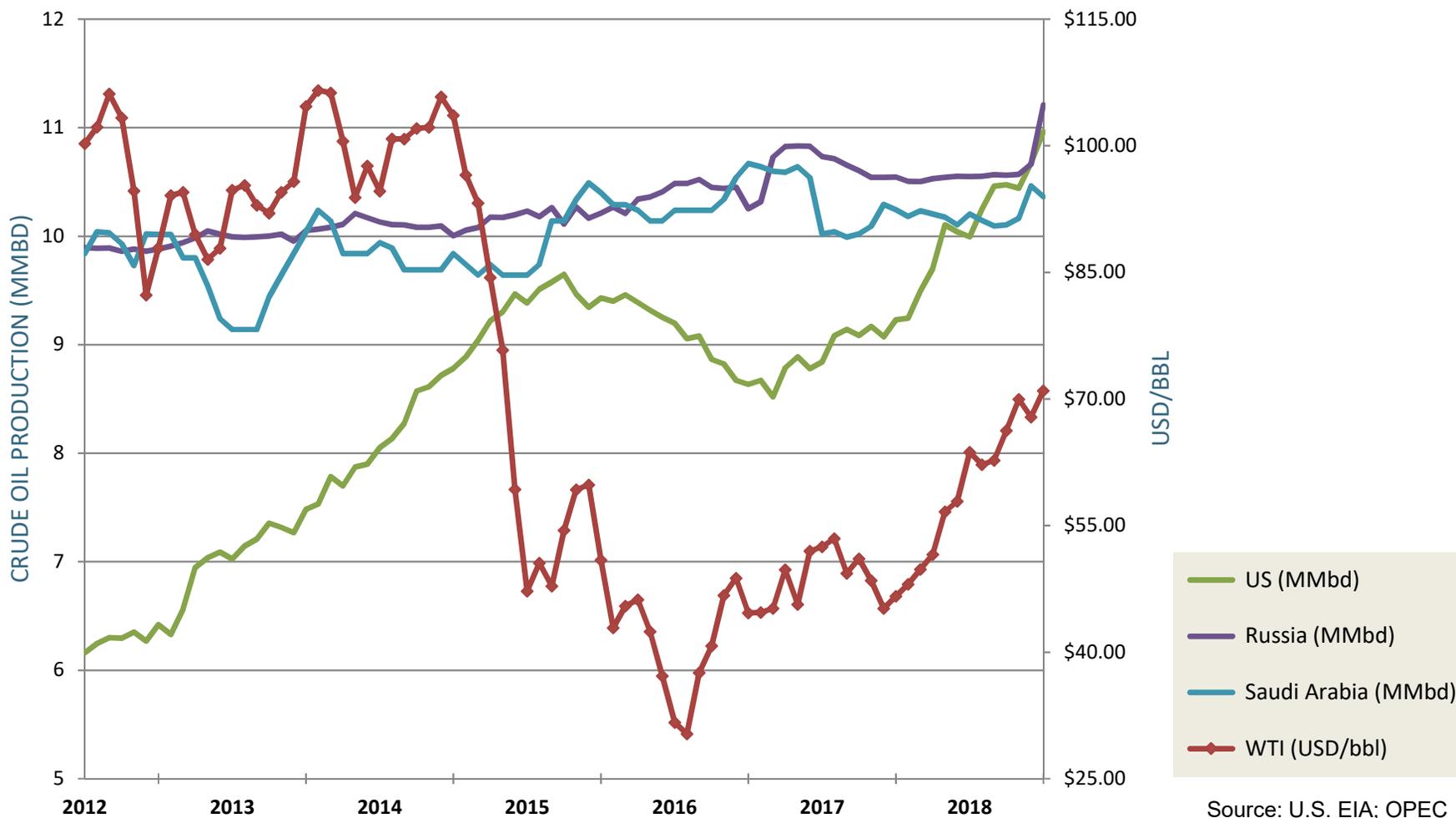
Source: U.S. EIA

Crude Oil Production vs. WTI

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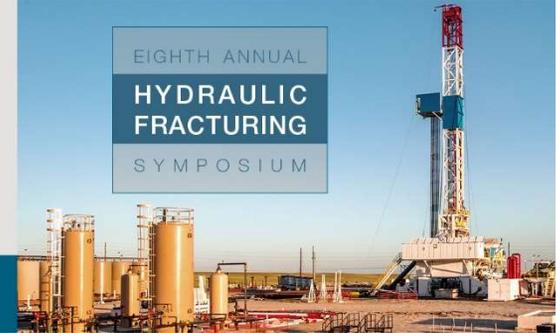
January 2012 – July 2018



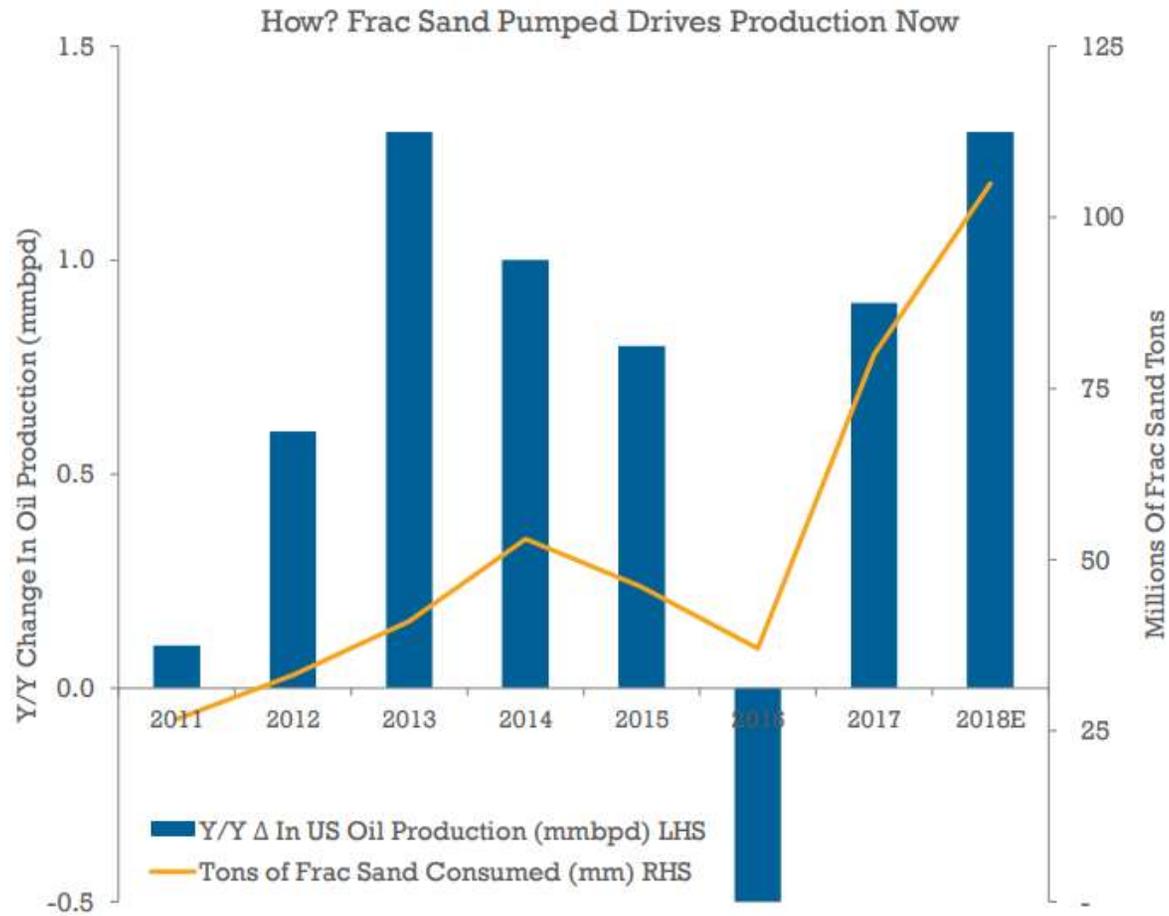
Source: U.S. EIA; OPEC

Crude Oil Production

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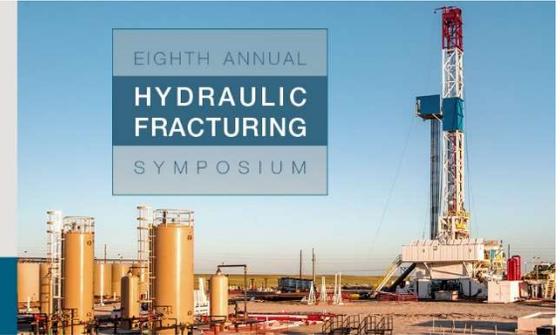
Frac Sand as Driver



Source: Industrial Minerals Association – North America Spring 2018 Meeting

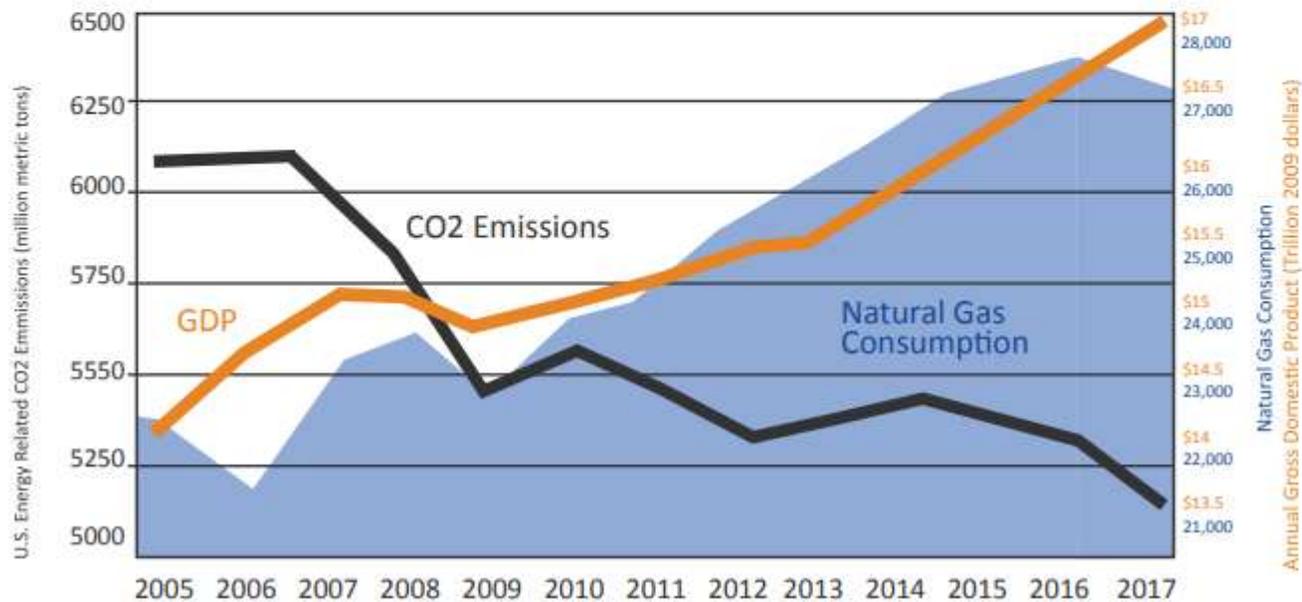
Natural Gas Consumption vs. CO2 Emissions

2005 – 2017



energyindepth.org

CO2 Emissions Plummet as Natural Gas Consumption, GDP Soar



Source: EnergyInDepth

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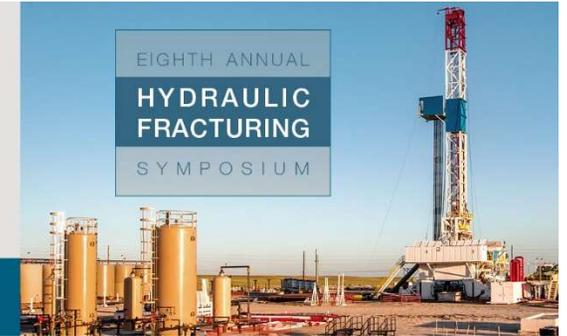
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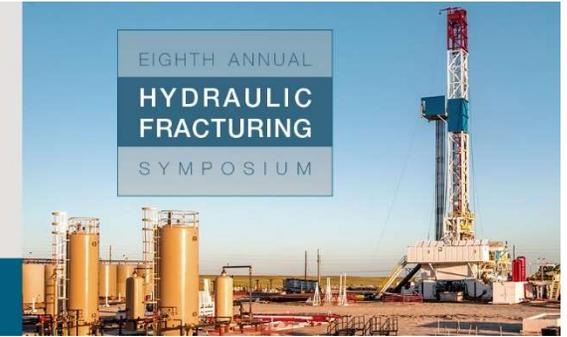
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- U.S. Government Resources
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“If it’s happening in Fracking, you’ll find it here.”

Redesigned Shale & Fracking Tracker

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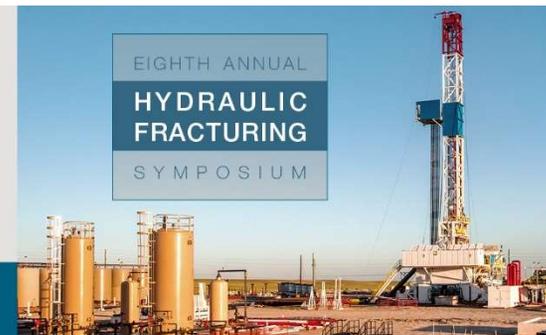


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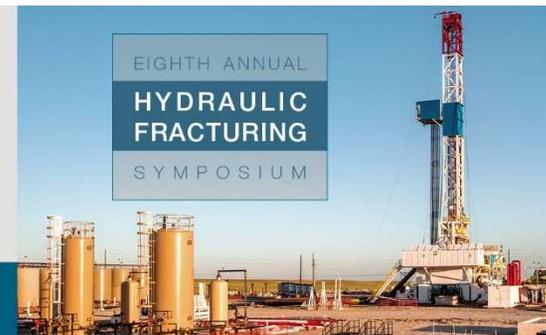
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- Screened by V&E attorneys
- Updated every business day
- Typically post 2-5 headlines per day

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U.S. State Hydraulic Fracturing Resources

Global Hydraulic Fracturing Resources

NEWS & FLASHES



Colorado Secretary of State Certifies Initiatives 97 and 108 for November Ballot

08-30-2018

On August 29, 2018, the Colorado Secretary of State (the "Secretary") certified that Initiative 97, which would increase oil and gas development setback distances to 2,500 feet from "occupied structures" and "vulnerable areas," had gathered a sufficient number of valid signatures to appear on the ballot this November. The certification of Initiative 97 comes the day after the Secretary similarly announced that industry-backed Initiative 108 will also appear on the November ballot. A direct response to Initiative 97, Initiative 108 would provide property owners with just compensation when a state or local government

Daily Fracking News

► **Researchers: "No Link" between Fracking And Methane in North Texas Groundwater**

September 26, 2018 | Houston Public Media

► **Cuadrilla prepares to start commercial fracking**

September 26, 2018 | Financial Times

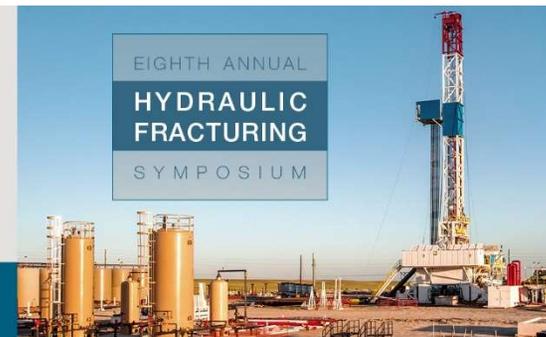
► **Methane fears cloud Argentina's shale oil and gas future**

September 24, 2018 | Financial Times

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- 1-3 paragraphs
- Links to primary documents: proposed rules, legislation, pleadings/decisions
- Recent topics:
 - Colorado ballot initiatives
 - Pennsylvania methane general permits
 - Oklahoma seismicity protocol

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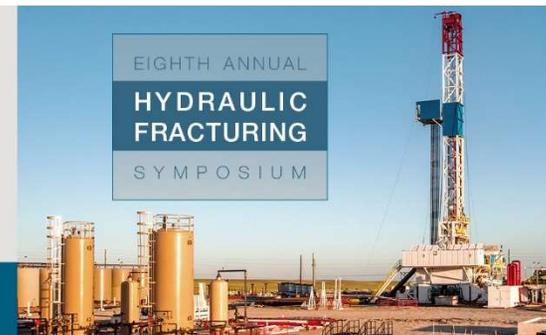
▶ Cuadrilla prepares to start commercial fracking
September 26, 2018 | Financial Times

▶ Methane fears cloud Argentina's shale oil and gas future
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- Full articles and fulsome analyses of key developments
- Recent topics:
 - Colorado ballot initiatives

08 August 2018

Author: **Larry J. Pechacek**

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Collision Course: Colorado Initiative #108 Seeks to Blunt Private Property Owners' Damages Occasioned by State and Local Government Through Initiative #97

A petition for ballot Initiative #108 was submitted to the Colorado Secretary of State in advance of the August 6, 2018 deadline for proposals to be considered for inclusion on Colorado's general election ballot on November 6, 2018. Touted as a "property rights" measure, Initiative #108 proposes to amend the Colorado Constitution in order to provide an equal playing field for private property owners seeking just compensation when state or local government takes action diminishing the "fair market value" of their properties.

Ballot initiatives in the state require the support of at least 98,492 valid signatures in order to be placed on the November 2018 ballot. It is being reported that a record 209,000 signatures have been turned in to the

Secretary of State's office together with the petition for Initiative #108. The Colorado Secretary of State's office has 30 days to review the information provided on the petition and determine whether the proposed measure has garnered sufficient valid signatures to be placed on the November 2018 ballot.

07 August 2018

Author: **Larry J. Pechacek**

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- › Oil and Gas
- › State Issues

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Colorado Initiative #97: The Petition Beats the Deadline but is it Enough?

The Office of the Colorado Secretary of State confirmed on Monday, August 6, 2018 that a petition for ballot Initiative #97 was turned in by the deadline period and will be considered for inclusion on the November 6, 2018 general election ballot. As we previously reported, Initiative #97 seeks to establish a 2,500-foot buffer zone that is free of new oil and gas development around defined "occupied structures" and "vulnerable areas" in the state. Occupied structures include homes, schools and hospitals, whereas vulnerable areas include playgrounds, permanent sports fields, public parks and open spaces, public drinking water sources, reservoirs, lakes, rivers, perennial or intermittent streams, and creeks between homes and new oil and gas development.

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26 July 2018

Author: **Larry J. Pechacek**

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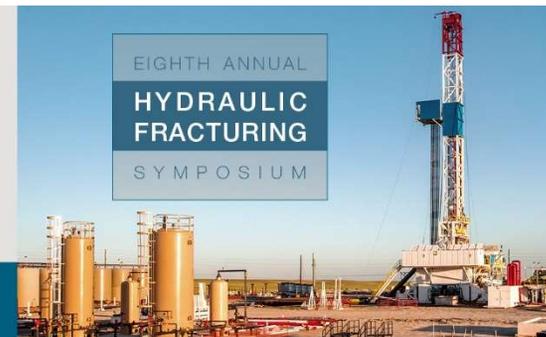
Is the Third Time the Charm? - Initiative #97 Seeks a Five-Fold Increase in Setback Distances Between Homes and New Oil and Gas Development in Colorado

Following on the heels of failed attempts in 2014 and 2016, proponents of greater restrictions against new oil and gas exploration and production activities in Colorado are once again seeking to increase the regulatory setback distance between homes and new oil and gas development in the state. Currently, proponents of a ballot initiative – Initiative #97 – are working to obtain enough signatures to place the proposal on the Colorado ballot in November 2018. If placed on the ballot and approved, the measure would increase setback distances five-fold – from 500 feet to 2,500 feet. Backers of Initiative #97 have until August 6, 2018 to collect some 100,000 or more valid signatures to assure its placement on the November 2018 ballot. If placed on the ballot and approved, Initiative #97

could have a devastating impact on new oil and gas exploration and production activities in Colorado.

State/Country Profiles

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- Regularly updated summaries of regulatory schemes and current developments
- Covers 13 states and 14 countries

OKLAHOMA

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Oklahoma contains extensive natural gas reserves across its Anadarko, Arkoma, and Ardmore basins.¹ The Woodford Shale, the state's largest shale formation, straddles the Ardmore Basin and the Arkoma Basin.² In 2011, the U.S. Energy Information Administration estimated that the Woodford Shale contained up to 22.2 trillion cubic feet of technically recoverable natural gas.³



Statutory and Regulatory Framework

The state's primary oil and gas regulator is the Oklahoma Corporation Commission's (OCC) Oil and Gas Conservation Division (OGCD).⁴ The OCC promulgates regulations regarding drilling, operation, maintenance, and abandonment of hydraulic fracturing wells, among other things.⁵ OGCD regulations intersect with those of the Oklahoma Water Resources Board (OWRB),⁶ which regulates the beneficial use of groundwater and surface water,⁷ and the Oklahoma Department of Environmental Quality.⁸

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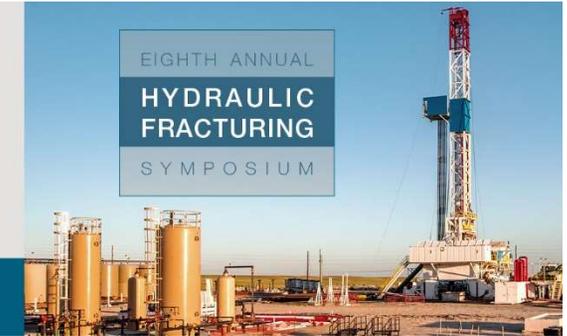


U.S. State Hydraulic Fracturing Resources

Global Hydraulic Fracturing Resources

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Statutory and Regulatory Framework

Oil and gas development is governed primarily by the Colorado Oil and Gas Conservation Act⁴ and rules promulgated by the Colorado Oil and Gas Conservation Commission ("COGCC").⁵ The COGCC is a division of the Colorado Department of Natural Resources ("DNR"), and has broad statutory authority with respect to impacts on any air, water, soil, or biological resources resulting from oil and gas operations.⁶

The COGCC evaluated hydraulic fracturing risks when it comprehensively updated its regulations in 2008,⁷ adopted a chemical disclosure rule in 2012,⁸ and adopted statewide water sampling and monitoring rules in 2013.⁹ Colorado's rules also include well casing and cementing requirements,¹⁰ "buffer zones" near surface waters and tributaries that are sources of public drinking water,¹¹ and other setback requirements.¹²

The DNR Division of Water Resources ("DWR") oversees the administration of surface and groundwater, including water produced by and used in oil and gas activities.¹³ However, a Memorandum of Agreement ("MOA") between the COGCC and the Water Quality Control Division ("WQCD") of the Colorado Department of Public Health and Environment ("CDPHE") transfers reporting and initial oversight responsibilities for spills and releases from oil and gas operations to the COGCC, including responding to spills associated with hydraulic fracturing.¹⁴

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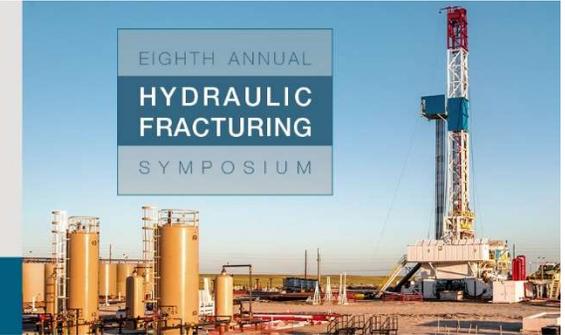
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- ▶ [Colorado Secretary of State Certifies Initiatives 97 and 108 for November Ballot](#)
August 30, 2018
- ▶ [Supporters of Colorado Initiative 97 Submit Signatures to Secretary of State](#)
August 7, 2018
- ▶ [Colorado Anti-Fracking Measures Fail to Satisfy Signature Validation Requirements](#)
August 29, 2016

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A map of the United States with several blue location pins placed across various states. A white menu box is overlaid on the map, listing resource categories. Below the map, there are two dark teal buttons: "U.S. State Hydraulic Fracturing Resources" and "Global Hydraulic Fracturing Resources".

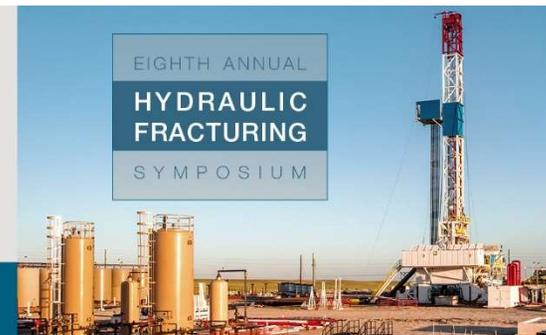
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Eighth Annual Hydraulic Fracturing Symposium
10-03-2018



Impending Chaos: Colorado Initiatives 97 and 108 Both Make the November 2018 Ballot
09-07-2018



Collision Course: Colorado Initiative #108 Seeks to Blunt Private Property Owners' Damages Occasioned by State and Local Government Through Initiative #97
08-08-2018



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07-26-2018

Daily Fracking News

Too much oil? Texas boom outpaces supply, transport networks
October 2, 2018 | Reuters

Researchers: "No Link" between Fracking And Methane in North Texas Groundwater
September 26, 2018 | Houston Public Media

Cuadrilla prepares to start commercial fracking
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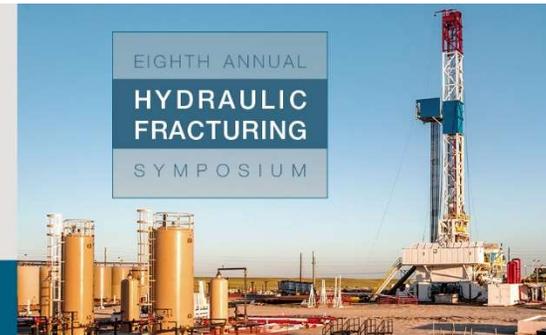
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THE VINSON & ELKINS SHALE AND FRACKING PRACTICE GROUP

Our Shale and Fracking practice group focuses on a broad base of issues encountered in recovering oil and gas from the emerging shale using techniques that have revolutionized the oil and gas business. Our practice group is cross-disciplinary and international, led by senior members of our Environmental/Regulatory, Litigation, Transactional, Intellectual Property, and Occupational Safety and Health practice groups. We serve the needs of our broad base of worldwide oil and gas, oil service, midstream energy, investment and financial clients in this rapidly developing area. We hope to provide you with the latest legal, regulatory and newsworthy developments.

Members of our Shale and Fracking practice group stand ready to assist you on legal and regulatory matters that you may have. See more information about the group's members below.

Fracking Practice Group Sections and Contacts:

Environmental/Regulatory Practice
Contacts: Larry W. Nettles, George C. Hopkins

V&E's environmental and regulatory lawyers have an elite depth and breadth of knowledge in oil and gas operations and the environmental and regulatory issues facing the industry value chain from exploration and production, through transportation to the downstream sectors. V&E is actively engaged in advising clients on all manner of environmental and regulatory issues arising from unconventional oil and gas development and hydraulic fracturing operations. Our broad experience in these areas covers environmental counseling, permitting, enforcement defense, private-party litigation, and transactional matters.

Litigation Practice
Contacts: James D. Thompson III, Mark C. Rodriguez

V&E's energy litigation team offers a unique combination of technical knowledge in energy operations with decades of experience as lead counsel in virtually all types of energy-related disputes. V&E has a long history of representing energy clients in litigation, arbitration, administrative proceedings, and enforcement actions arising from their operations, including matters related to unconventional oil and gas development and hydraulic fracturing. Our trial lawyers are intimately familiar with the technical aspects of unconventional resource development and hydraulic fracturing, and with our clients' business operations in these areas.

Transactional Practice
Contacts: John B. Connally IV, James M. Prince

V&E's transactional practice groups serve clients in financing, development, acquisition, divestitures, and joint ventures to explore and develop shale formations and other unconventional oil and gas resources around the globe. Our knowledge of the business fundamentals of upstream, midstream, and downstream oil and gas operations makes us trusted legal advisors to our world-wide client base on all facets of their business, including financing options, operating agreements, acquisitions and divestitures, creation of joint ventures or partnerships, capital formation including securities offerings, oil and gas law, and tax.

Daily Fracking News

- ▶ **Too much oil? Texas boom outpaces supply, transport networks**
October 2, 2018 | Reuters
- ▶ **Researchers: "No Link" between Fracking And Methane in North Texas Groundwater**
September 26, 2018 | Houston Public Media
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- We have you covered on Initiative 97:
 - Dozens of daily news articles
 - Summary of issue on Colorado profile
 - Two “frack” flashes
 - Four publications
 - Three Environmental Blog posts
 - One client alert



V&E Shale Insights, September 7, 2018

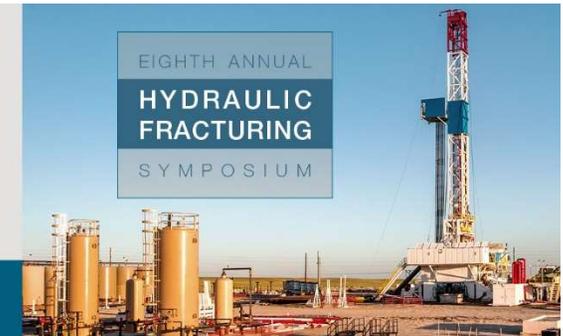
Two ballot initiatives that may well shape the financial future of the state of Colorado and its citizens will be on the November 2018 ballot. One of those initiatives could determine the future viability of the oil and gas industry in the state.

The two ballot proposals – Initiative 97 and Initiative 108 – have been depicted as contrary measures that are likely to dominate the topic of discussion among Colorado voters in the weeks leading up to election day. Initiative 97 will appear as Proposition 112 on the 2018 ballot and seeks to increase oil and gas facility setback distances on non-federal lands to 2,500 feet. Initiative 108 will appear as Amendment 74 on the 2018 ballot and would require that property owners be compensated for any reduction in property value due to any new governmental law or regulation. Over a two-day stretch, on August 28 and 29, 2018, the Colorado Secretary of State announced that each of Initiative 97 and Initiative 108 has garnered a sufficient number of valid signatures to be included on the state ballot.

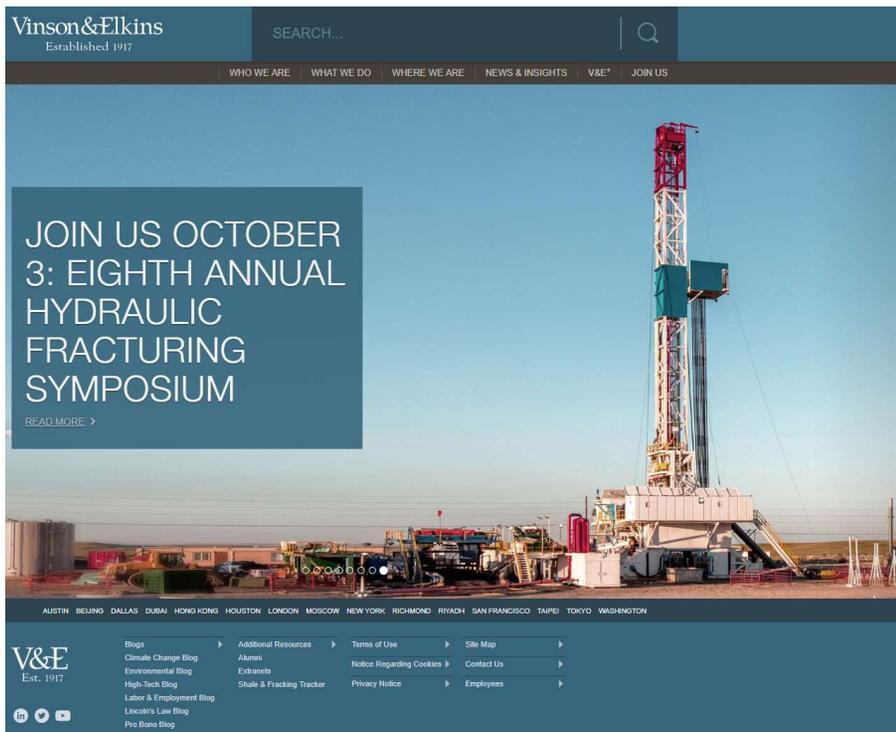
Depending on whom you ask, the ballot initiatives either represent a blow for property rights or are a harbinger of impending fiscal doom to the state's economy. One thing is for sure, the citizens of Colorado will be the recipients of an onslaught of television pitches, radio ads and town hall meetings regarding these two measures over the next 9 weeks intended to educate, sway votes and/or instill fear in the citizenry prior to the November 6, 2018 general election day.

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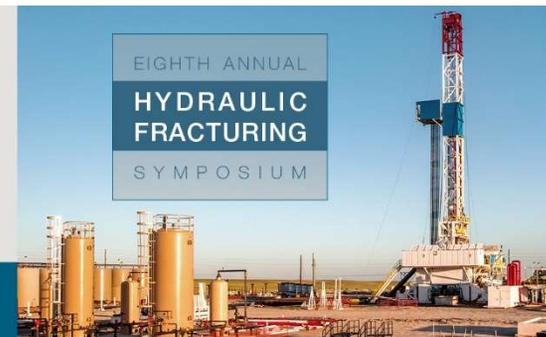
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Speaker Biography



Jay's principal area of practice is environmental law, with emphasis on environmental and toxic tort litigation, cost recovery litigation, enforcement defense, and emergency response to refinery, plant, and pipeline accidents. His other practice areas include permitting and transactional environmental issues, environmental criminal defense, and general litigation. Jay is a member of the firm's Shale and Hydraulic Fracturing Task Force.

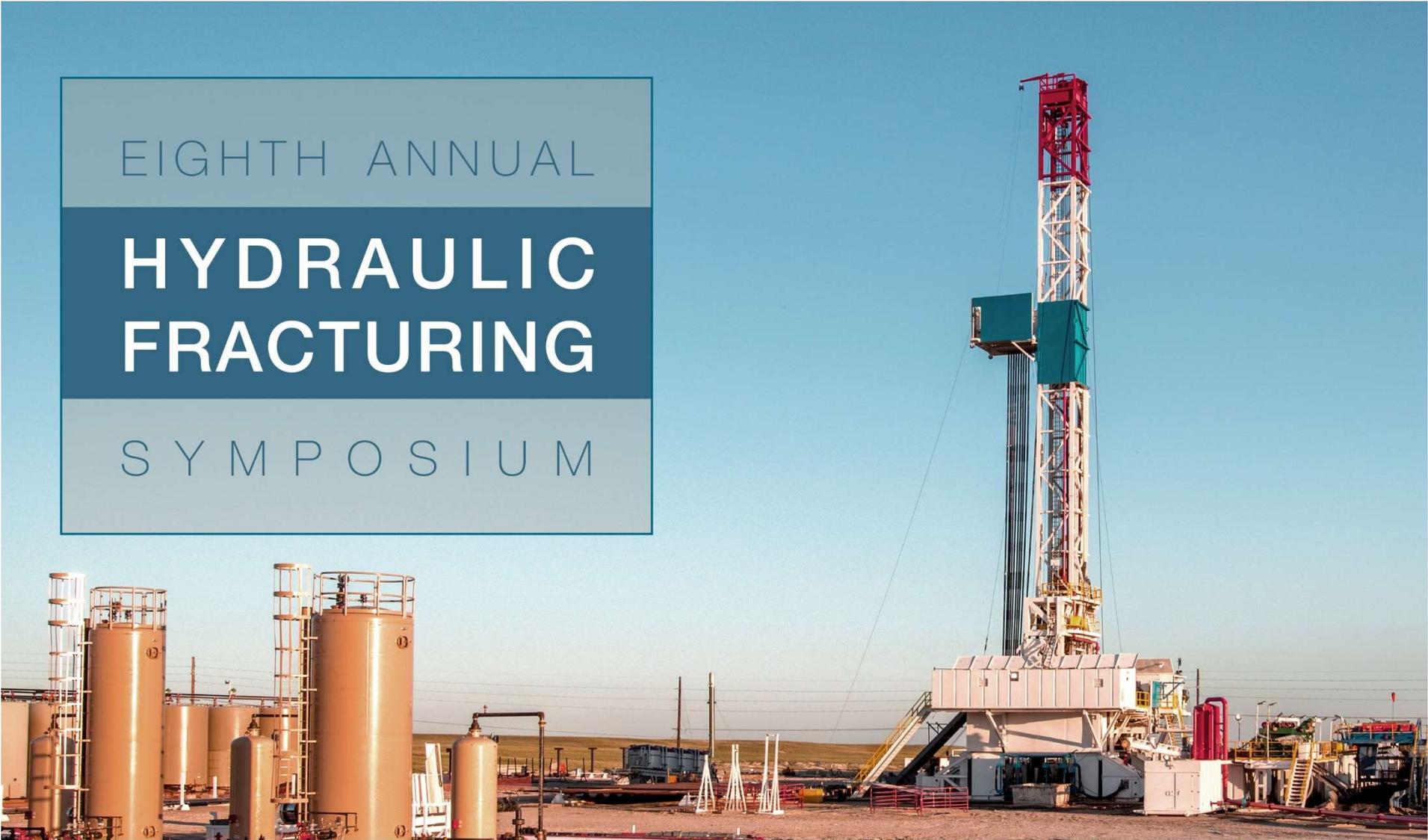
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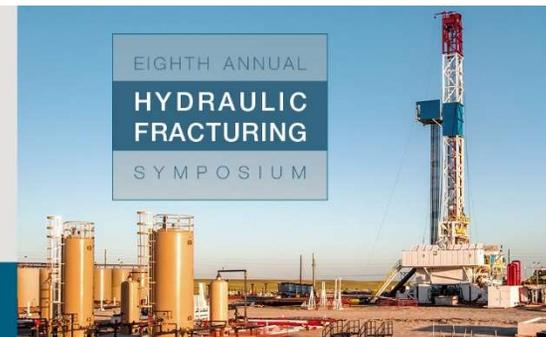
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REGULATORY UPDATE

Regulatory Rollback

Day 621 Check-in

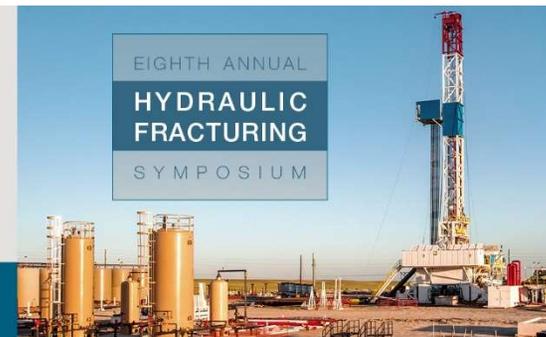


- Shortly after the inauguration, the Trump Administration issued several Executive Orders calling for the review and potential rescission of many regulations.
 - Agencies must comply with the Administrative Procedures Act (APA) in rolling back regulations.
 - This includes creating an administrative record and the obligation of reasoned decision making.
 - Repeal or revisions of rules based on existing scientific record and action-forcing statutes present significant litigation risk.



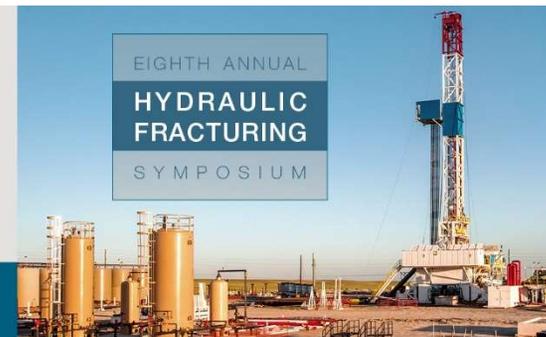
Regulatory Rollback

Day 621 Check-in



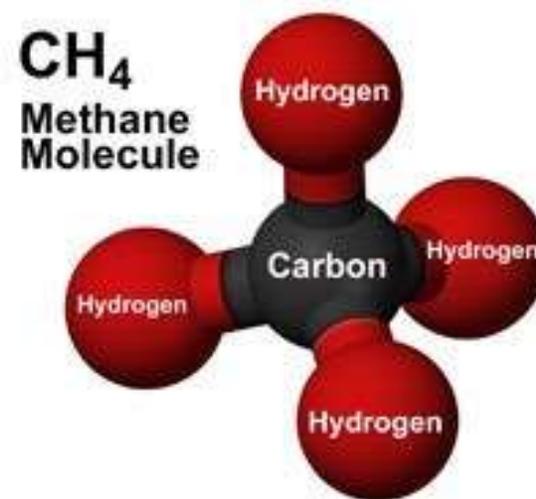
- To date, relatively little existing regulations removed from the books.
- Considerable number of significant regulations withdrawn, delayed, or extended.
 - As of August 2018, the Trump Administration claims to have withdrawn 635 pending regulations, and delayed as many as 700 others.
- Near-universal legal challenges to rollback actions.
- Slowdown in new regulatory activity.

Regulatory Rollback

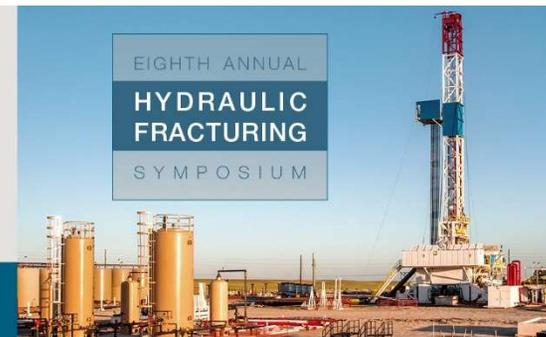


Quad Oa

- On July 2, 2017, the D.C. Circuit struck down EPA's 90-day stay of the NSPS methane rules (Quad Oa).
- EPA has issued a proposed rule to stay Quad Oa for 2 years, but this rule is not yet final.
- In March 2018, EPA issued final amendments narrowing Quad Oa's fugitive emissions requirements.
- On September 11, 2018, EPA published a proposed rulemaking consisting of "targeted improvements" to Quad Oa.
- Meanwhile, other Quad Oa requirements are in force as initially promulgated.



Regulatory Rollback

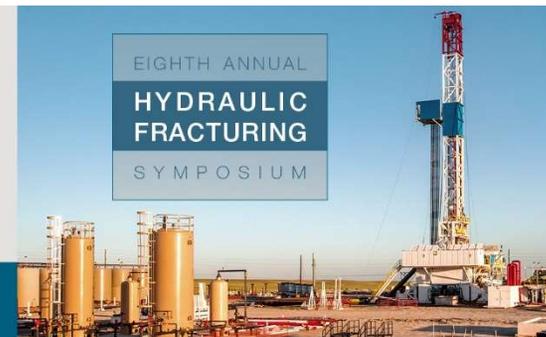


Quad Oa – Proposed “Targeted Improvements”

- EPA’s proposed “targeted improvements” to Quad Oa include:
 - Modified schedule for fugitive emissions monitoring and repairs at well sites and compressor stations.
 - Ability to meet certain existing state fugitive emissions requirements as an alternative to NSPS compliance (including well sites in Texas and Colorado).
 - Expanded technical infeasibility exception to pneumatic pump requirements.
 - Streamlined process for requesting an alternative means of emissions limitation.
- EPA’s Regulatory Impact Analysis estimates savings to industry of \$367-\$484 million from 2019-2025.
- Proposed rule will be subject to 60-day comment period upon publication in Federal Register.
- EPA continuing to evaluate the “broad policy issues” of Quad Oa.

Regulatory Rollback

Voluntary Methane Reductions



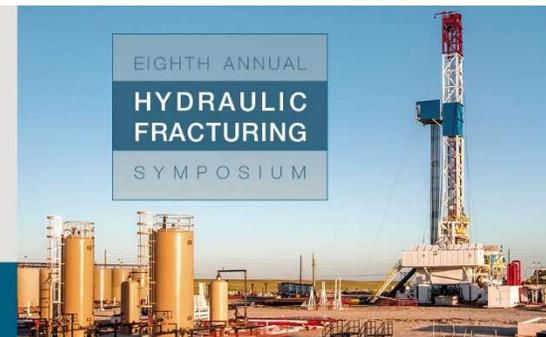
- Notwithstanding the Trump Administration's rollback of Quad Oa, the industry has committed to reduce methane emissions.
- On September 24, 2018, the Oil and Gas Climate Initiative, which includes many of the world's top oil and gas companies, committed to a 20% reduction in methane emissions by 2025.
- Such efforts are important to oil and gas companies in an era of investor activism and lawsuits focused on GHG emissions.



Source: Axios

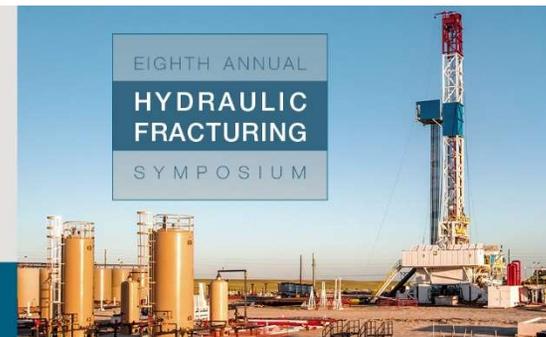
Regulatory Rollback

Clean Power Plan



- President Trump's March 2017 Executive Order on Energy Independence called for EPA to review the Clean Power Plan (CPP).
- Litigation challenging the CPP has been held in abeyance by the D.C. Circuit since April 2017.
 - On September 14, 2018, groups and states supporting the CPP filed a motion asking the court to decide the merits of the case.
 - On September 17, 2018, EPA filed a brief supporting a continued abeyance while it finalizes a replacement rule.
- In the meantime, the CPP remains subject to the U.S. Supreme Court's 2016 stay.

Regulatory Rollback

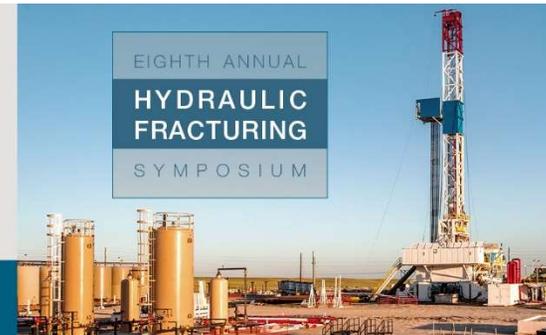


Clean Power Plan – Repeal and Replacement

- On October 16, 2017, EPA proposed a rule that would repeal the CPP.
 - The comment period closed on April 26, 2018, but the rule is not yet final.
- On August 21, 2018, EPA proposed a replacement rule—the Affordable Clean Energy Rule (ACE Rule).
 - The rule would establish emission guidelines for states to develop plans to address GHG emissions from existing coal-fired power plants.
 - The rule would also update EPA’s New Source Review permitting program to incentivize efficiency improvements.
 - EPA estimates that replacing the CPP with the ACE Rule could result in \$3.4 billion in net benefits, including as much as \$6.4 billion in avoided compliance costs.
- Public comment period is open through October 31, 2018.
- Based on its filings in the CPP litigation, EPA expects to take final action “by the first part of 2019.”

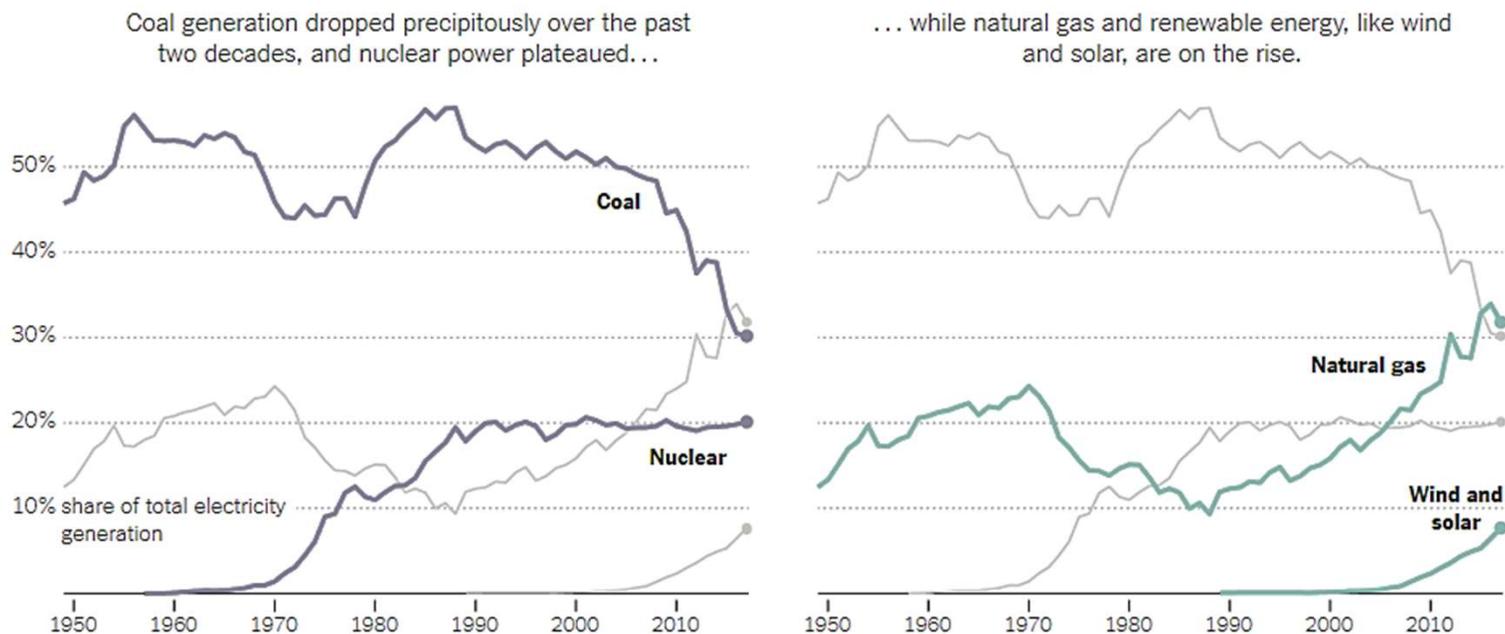
Regulatory Rollback

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Clean Power Plan – Trends in Power Generation

- Notwithstanding any eventual replacement of the CPP, the underlying economic trends continue to support an increasing role for natural gas-fired power generation.

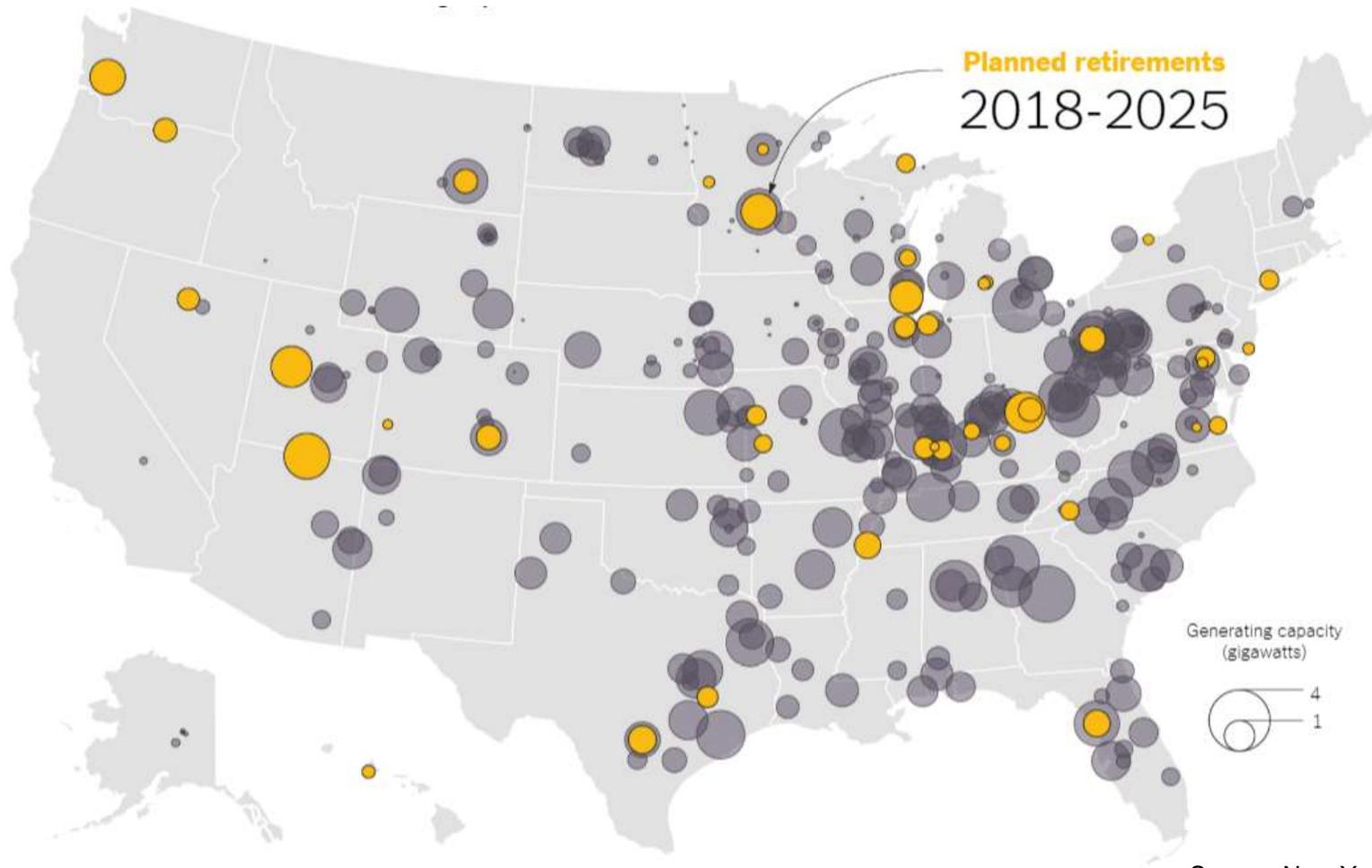


By The New York Times | Source: Energy Information Administration. Hydroelectric and other sources of electricity generation are not shown.

Regulatory Rollback

Clean Power Plan – Coal Generation & Planned Retirements

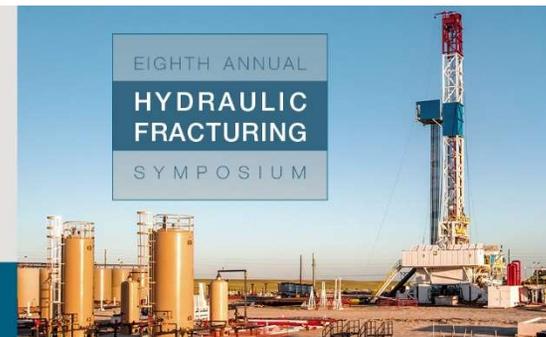
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Source: New York Times

Regulatory Rollback

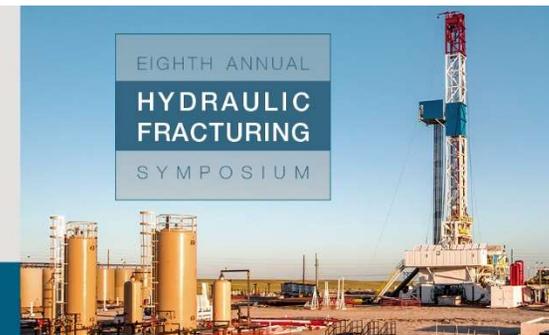
WOTUS



- In August 2015, a federal court in North Dakota enjoined EPA’s expansive waters of the U.S. rule (WOTUS) in 13 states.
 - Shortly thereafter, the Sixth Circuit stayed the rule nationwide.
- On February 28, 2017, President Trump issued an Executive Order calling for EPA to review the WOTUS rule.
- EPA’s proposed rulemaking process will proceed in two steps:
 - First, EPA will repeal the 2015 version of the WOTUS rule and replace it with the pre-2015 version.
 - Second, EPA will reevaluate and revise the definition of “waters of the U.S.” under the CWA.

Regulatory Rollback

WOTUS – Repeal and Replace

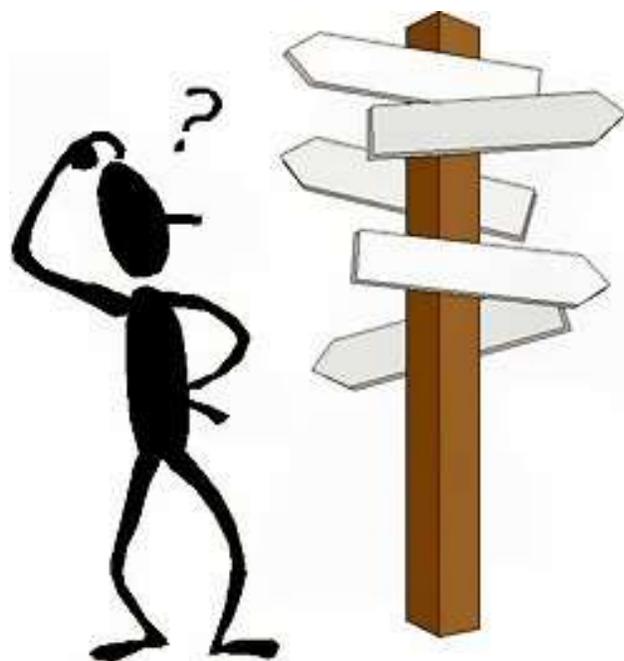
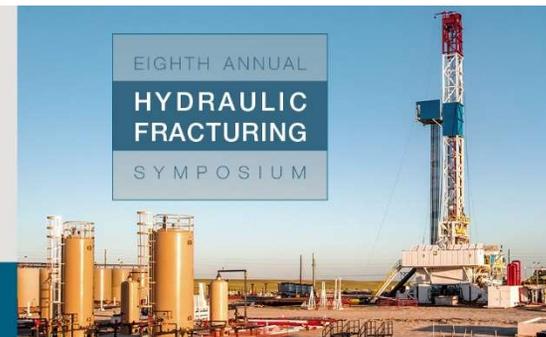


- EPA published its proposed rule to repeal the 2015 WOTUS rule and replace it with the pre-2015 version on July 27, 2017.
 - On July 12, 2018, EPA issued a supplemental notice of proposed rulemaking bolstering the proposed rule’s legal justification and broadening the scope of comments solicited.
 - A supplemental public comment period concluded on August 13, 2018, but EPA has not yet issued a final rule.
- In Fall of 2017, EPA held a series of public meetings and accepted written recommendations on how to revise the definition of “waters of the U.S.”
 - The docket for written recommendations closed on November 28, 2017, but EPA has yet to issue a proposed replacement rule.



Regulatory Rollback

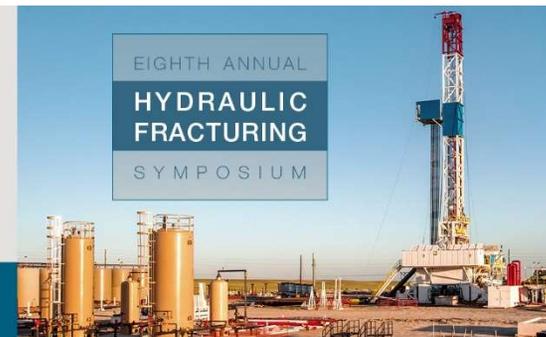
WOTUS – Litigation Status



- In January 2018, the U.S. Supreme Court held that the Sixth Circuit lacked jurisdiction over the legal challenge to the 2015 WOTUS rule.
- Shortly thereafter, EPA finalized a rule adding an applicability date—February 6, 2020—to the 2015 WOTUS rule (the Delay Rule) to prevent the inconsistent application of that rule across the country.
 - After a legal challenge, a federal court in South Carolina issued a nationwide injunction keeping the Delay Rule from taking effect.
- On February 28, 2018, the Sixth Circuit lifted its nationwide stay and dismissed the case for lack of jurisdiction.
- In June 2018, a federal court in Georgia enjoined the 2015 WOTUS rule in 11 additional states.

Regulatory Rollback

BLM Fracking Rule



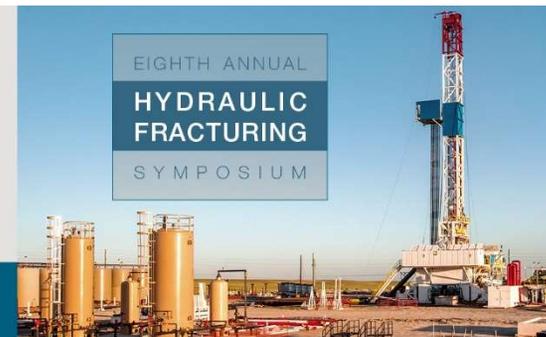
- BLM's 2015 Fracking Rule was struck down in 2016 by a federal district court in Wyoming, which held that BLM lacked authority to regulate hydraulic fracturing.
- On September 21, 2017, the Tenth Circuit vacated the district court's decision and dismissed the case in light of BLM's proposal.
 - Environmental groups argued that the decision effectively reinstated the 2015 Fracking Rule.
 - The Tenth Circuit's decision could open the door to future BLM fracking regulations by vacating the district court's broad decision.
- In December 2017, BLM finalized a rulemaking to rescind the 2015 Fracking Rule.
 - That action has been challenged by California and several environmental groups in litigation pending before the U.S. District Court for the Northern District of California.



Regulatory Rollback

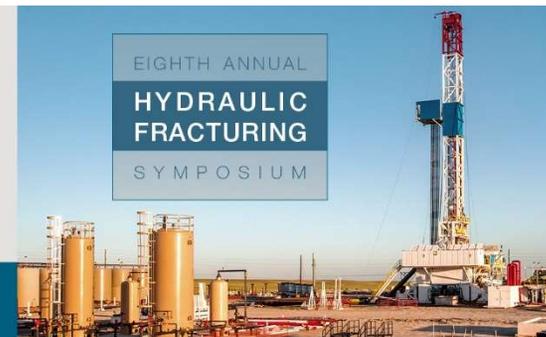
BLM Waste Prevention Rule

- On November 18, 2016, BLM published its final Waste Prevention Rule, which imposes additional emission controls related to venting, flaring, and leaking of natural gas.
 - The rule called for a “waste minimization plan” to be submitted in January 2017; other deadlines scheduled for January 2018.
- President Trump’s March 2017 Executive Order called for BLM to review the Waste Prevention Rule.
- On June 2017, BLM published a notice postponing the rule’s January 2018 deadlines, but this postponement was vacated by a federal court in California in October 2017.
- In December 2017, BLM finalized a rule pushing back compliance dates to January 2019 (Delay Rule).



Regulatory Rollback

BLM Waste Prevention Rule



- In February 2018, a federal court in California granted a preliminary injunction setting aside the Delay Rule.
- In April 2018, a federal court in Wyoming stayed the implementation of all phased-in requirements of the Waste Prevention Rule pending BLM's proposed revision.
- On September 18, 2018, BLM released a pre-publication version of a final rule that:
 - Rescinds all new requirements of the Waste Prevention Rule, and
 - Codifies BLM's prior approach to venting and flaring under NTL-4A, with certain improvements.
- On September 24, 2018—before BLM's final rule was even published in the Federal Register—California and New Mexico filed suit challenging the rule in the U.S. District Court for the Northern District of California.

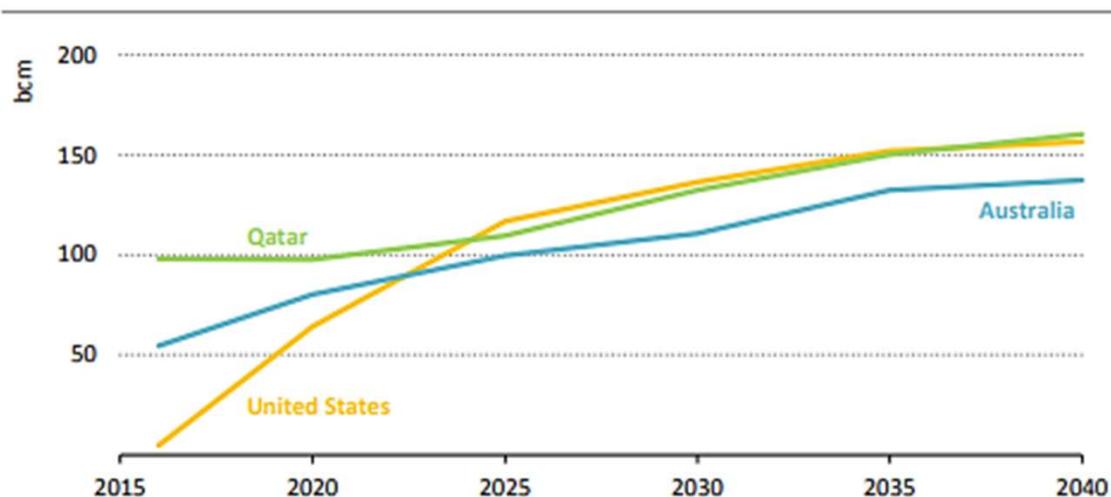
Regulatory Rollback

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DOE LNG Export Approvals

- On July 25, 2018, DOE finalized a rule expediting the application and approval process for small-scale exports of LNG to non-FTA countries.
 - Applications to export no more than 51.75 bcf of natural gas per year that qualify for a categorical exclusion under NEPA will receive automatic approval.

Figure 9.7 ▶ Selected LNG exports in the New Policies Scenario

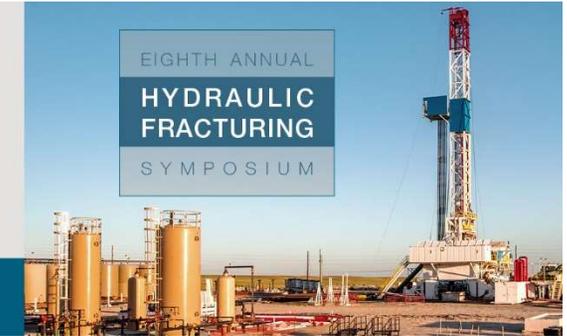


In the mid-2020s, the United States is expected to become the world's largest exporter of LNG

Source: 2017 IEA Outlook for Natural Gas ("New Policies Scenario" assumes existing policies and announced policy intentions)

State Developments

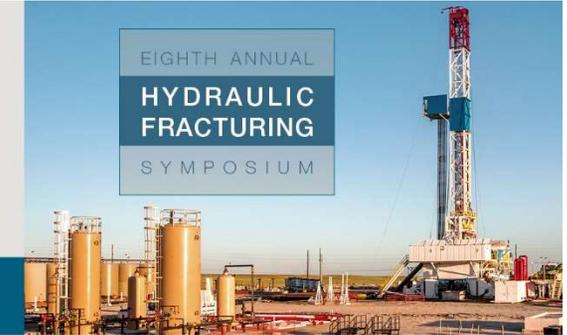
Colorado – Initiative 97



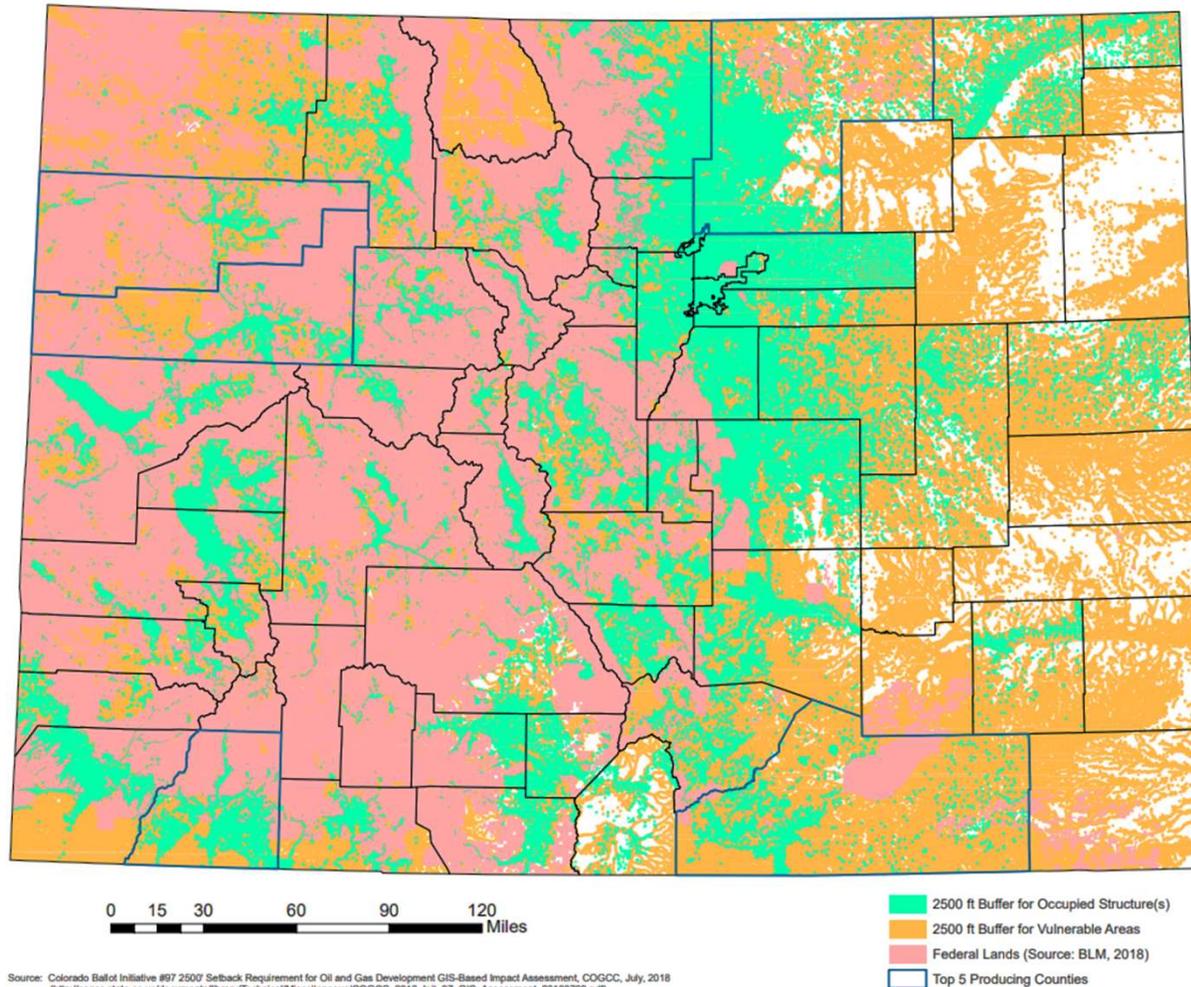
Source: news.kngu.org

- In August 2018, the Colorado Secretary of State certified two initiatives for the [November 2018 ballot](#).
 - Initiative 97 (Proposition 112 on the November ballot) would [increase oil and gas development setback distances](#) to 2,500 feet from “occupied structures” and “vulnerable areas.”
 - Initiative 108 (Amendment 74 on the November ballot) would provide property owners with [just compensation](#) when a state or local government takes action diminishing the “fair market value” of their properties.
 - A [direct response](#) to Initiative 97.
 - Appears designed to provide a compensation mechanism for oil and gas interests that would no longer be exploitable due to measures such as [Initiative 97’s setbacks](#).
- The showdown of these measures on the November 2018 ballot will decide [the future of the oil and gas industry](#) in the state—and Colorado’s economy more broadly.

State Developments



Colorado – Initiative 97



If enacted, Initiative 97 would prevent future development on:

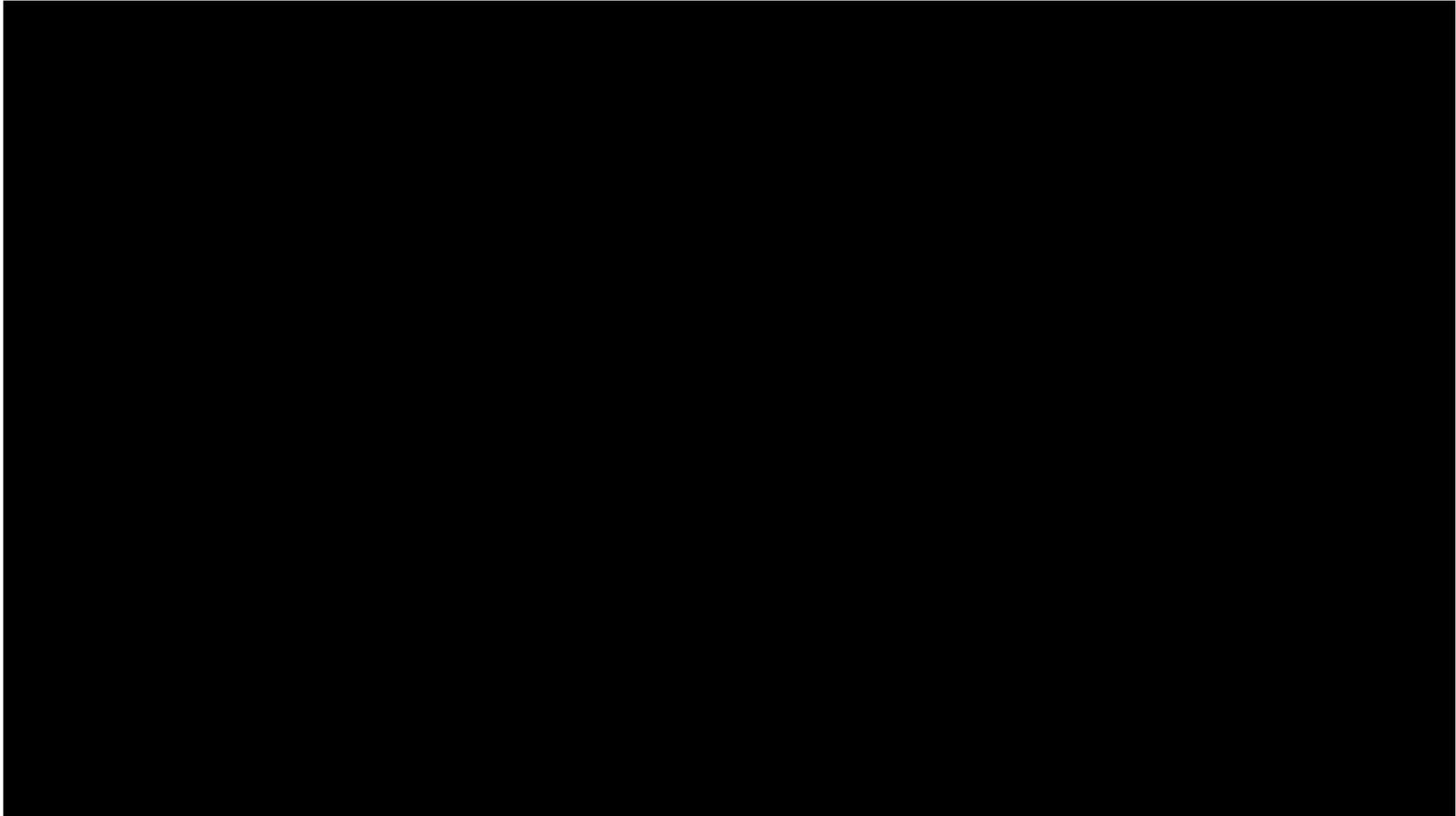
- 54% of Colorado's total land surface;
- 85% of all non-federal lands; and
- Between 85% and 99.9% of all non-federal lands in each of Colorado's top 5 producing counties.

Source: COGCC

Source: Colorado Ballot Initiative #97 2500' Setback Requirement for Oil and Gas Development GIS-Based Impact Assessment, COGCC, July, 2018 (http://coGCC.state.co.us/documents/library/Technical/Miscellaneous/COGCC_2018_Init_97_GIS_Assessment_20180702.pdf)

State Developments

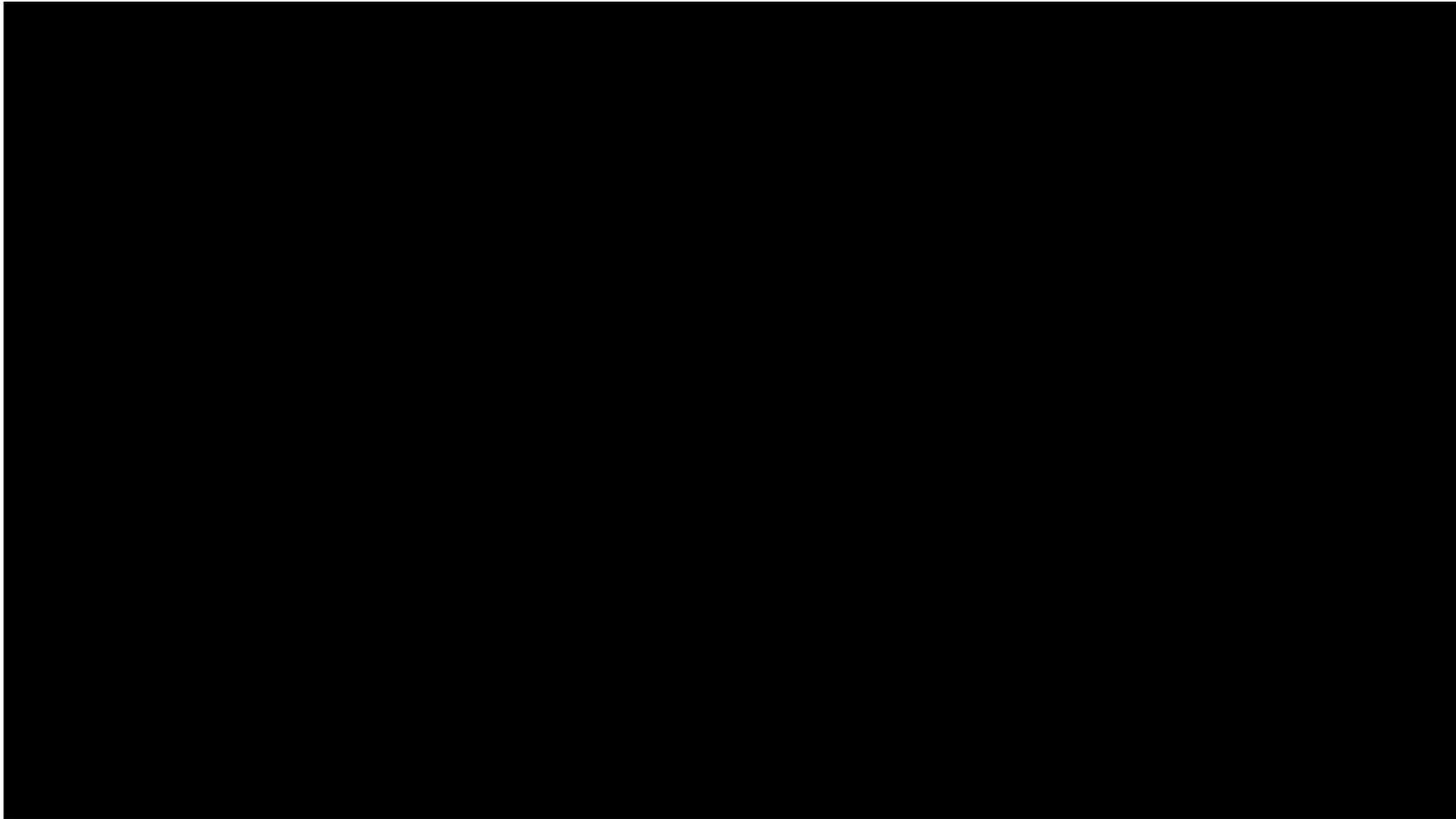
Colorado – Stapleton (R) on Initiative 97



Source: Western Wire; <http://westernwire.net/polis-to-industry-initiative-97-too-extreme-would-all-but-ban-fracking-in-colorado/>

State Developments

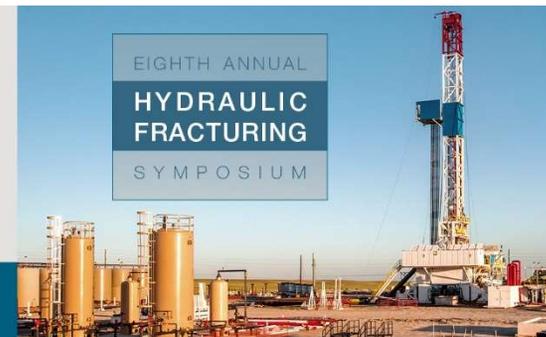
Colorado – Polis (D) on Initiative 97



Source: Western Wire; <http://westernwire.net/polis-to-industry-initiative-97-too-extreme-would-all-but-ban-fracking-in-colorado/>

State Developments

Colorado – Initiative 97 Early Round Scorecard



Early reporting states that industry's own internal polling shows 60% approval for Initiative 97.

For Initiative 97

- Colorado House Majority Leader KC Becker (D)
- Boulder County Commissioners
- Boulder Daily Camera

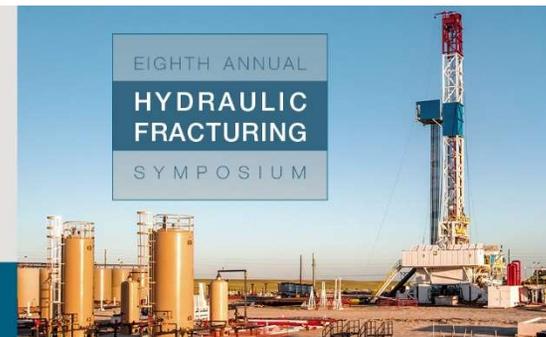
Against Initiative 97

- Weld County Commissioners
- Montezuma County Commissioners
- Greeley Mayor John Gates
- Denver Mayor Michael Hancock

VOTE

State Developments

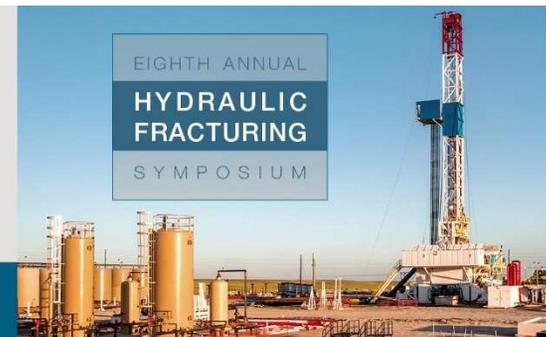
Pennsylvania – New General Permits Regulate Methane



- On June 9, 2018, DEP released revised versions of GP-5 and GP-5A, Pennsylvania’s general air permits applicable to compressor stations, processing plants, transmission stations, and well site operations.
 - GP-5 and GP-5A apply to new and modified sources constructed on or after August 8, 2018, with emissions below certain specified thresholds.
- GP-5 and GP-5A impose “Best Available Technology” (“BAT”) standards in addition to—and in many cases more stringent than—the federal NSPS.
 - These include a 200 tpy limit on methane emissions above which a BAT requirement for methane control applies.
 - This is the first such numeric threshold applicable to methane emissions from unconventional natural gas wells and midstream facilities.



State Developments



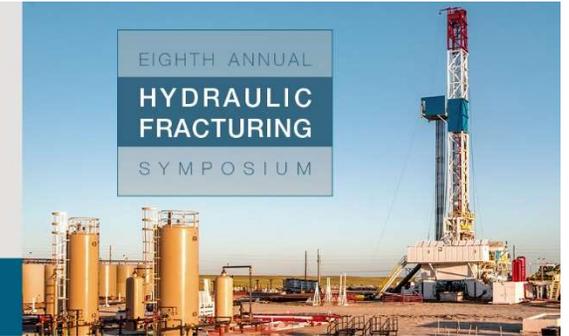
Pennsylvania – Chapter 78(a) Rules

- In October 2016, the Pennsylvania Department of Environmental Protection (DEP) promulgated new rules applicable to unconventional wells at Chapter 78a.
 - These rules were authorized in part by Act 13, a 2012 statute overhauling the state’s oil and gas development law.
- In November 2016, a Pennsylvania court blocked some Chapter 78a rules while an industry group pursued a legal challenge.
 - Legal challenges to 6 provisions of Chapter 78a remain pending, and 4 of these provisions remain subject to a preliminary injunction preventing their enforcement.
- In July 2018, DEP proposed a rule to increase the application fee for an unconventional well permit from \$5,000 to \$12,500.



State Developments

Texas – Dunes Sagebrush Lizard



Source: U.S. FWS

State Developments



Texas – Dunes Sagebrush Lizard

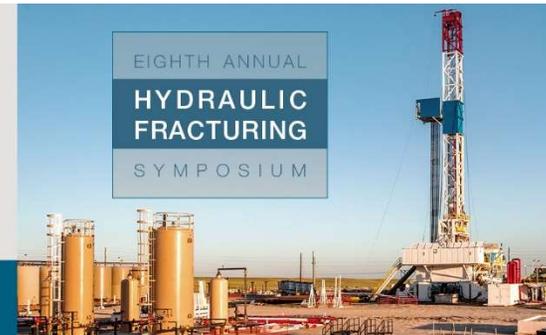
- In May 2018, environmental groups filed a petition with the U.S. FWS seeking the listing of the dunes sagebrush lizard under the Endangered Species Act.
 - The lizard’s habitat lies above the Permian Basin, in the fine sands sought after by frac sand miners.
 - Defenders of Wildlife estimated that more than 1,600 acres of the lizard’s habitat was destroyed over an 18-month period from 2017-2018.
- In August 2018, the Texas Comptroller’s Office released an updated conservation plan for the lizard, which would take effect in February 2019 subject to U.S. FWS approval.
- U.S. FWS has yet to act on either the environmental groups’ petition or the updated conservation plan.



Source: glo.texas.gov

State Developments

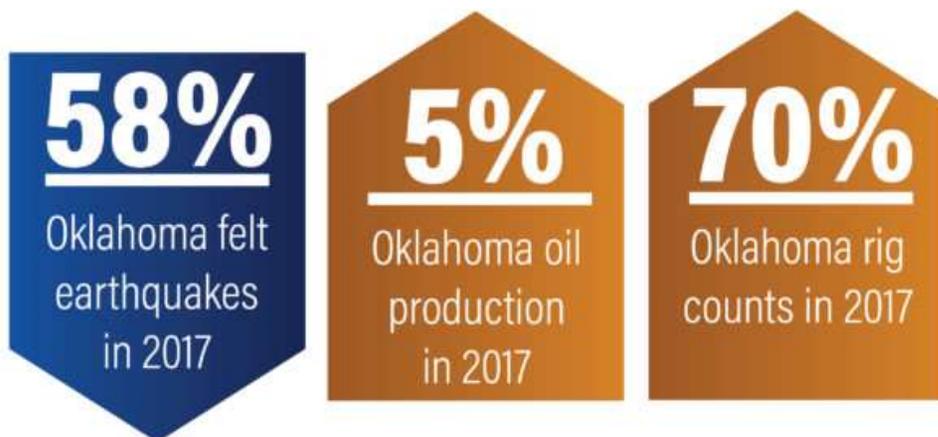
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Oklahoma Seismicity Update



Oklahoma Earthquakes Decline in 2017 as Production and Drilling Increase



Sources: U.S. Energy Information Administration, United States Geological Survey and Baker Hughes

Note: 2017 Oil Production is Projected Based on Available Production Data Through October

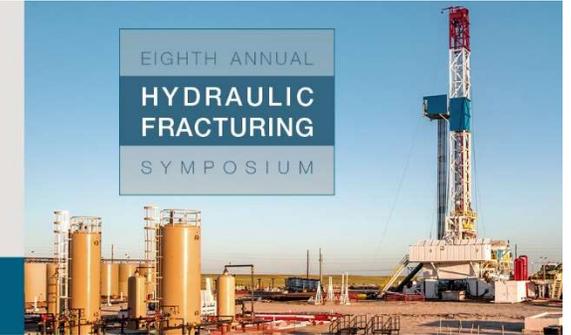
Source: EnergyInDepth

In February 2018, the Oklahoma Corporation Commission issued a revised seismicity protocol for operators in the SCOOP and STACK plays. The revised protocol:

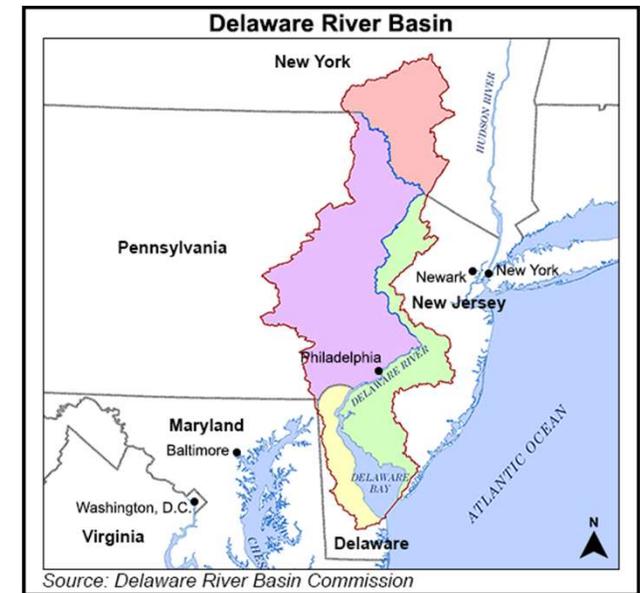
- requires operators in a certain defined area to have access to real-time seismicity readings;
- lowers the minimum level at which operators must take response actions from 2.5 to 2.0 magnitude;
- and requires some operators to pause their operations for 6 hours when readings exceed 2.5 magnitude (rather than 3.0 as under the previous protocol).

Efforts to Ban Fracking

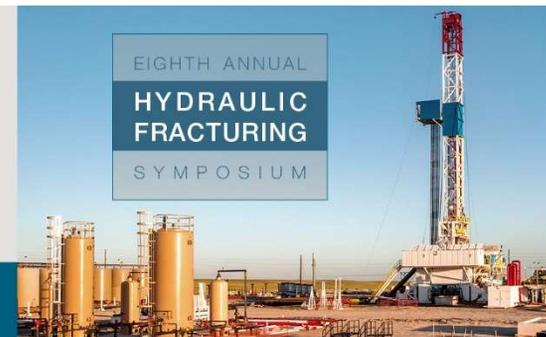
DRBC Proposal



- On November 30, 2017, the Delaware River Basin Commission (DRBC) published a proposed rule that would prohibit hydraulic fracturing within the Delaware River Basin.
 - The DRBC has been operating under a de facto moratorium since May 2010.
 - The DRBC held six public hearings on the proposed rule and concluded a 120-day comment period on March 30, 2018.
 - There is no set schedule for promulgation of a final rule.



Efforts to Ban Fracking



Local Efforts

- [Monterey County, CA](#): Voters approved fracking ban in November 2016—the first such ban in area with drilling activity.
 - Industry challenged the ban in court, but a May 2018 settlement keeps the ban in place for now (although it remains subject to a future challenge).
- [Lafayette, CO](#): Approved a six-month moratorium on drilling activity in November 2017, which was subsequently extended in May 2018 and again in August 2018 for another six-month period.
- [Boulder, CO](#): Approved a two-year extension of the city’s moratorium on hydraulic fracturing, which was enacted in June 2013 and set to expire in June 2018.
- [Youngstown, OH](#): Voters rejected a proposed ban on hydraulic fracturing for the seventh time in May 2018.



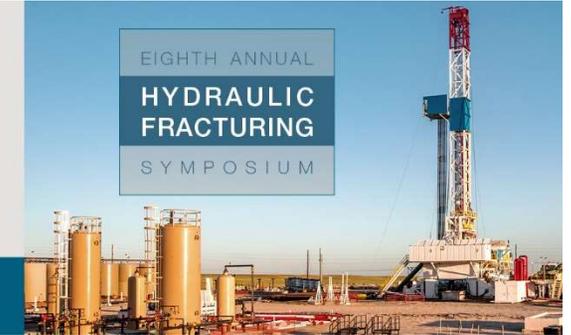
What to Watch For

Key Cases to Watch



- **Colorado**: State Supreme Court decision in *Martinez v. COGCC*.
 - “Whether the court of appeals erred in determining that the [COGCC] misinterpreted [its mandate] as requiring a balance between oil and gas development and public health, safety, and welfare.”
- **Pennsylvania**: Remand of *Wayne Land & Mineral Group v. DRBC*.
 - Federal district court in Pennsylvania to address whether natural gas production activities are a “project” under DRBC jurisdiction.

What to Watch For

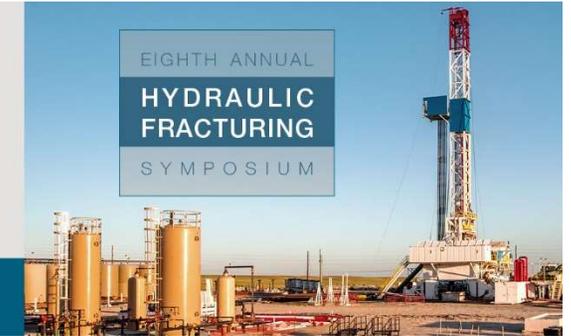


Key Cases to Watch

- **Pennsylvania**: Petition for cert to Pennsylvania Supreme Court in *Briggs v. Southwestern Energy Production*.
 - Plaintiffs are landowners who allege that unconventional wells drilled pursuant to a lease on a neighboring property constitute a trespass on plaintiffs’ property.
 - Trial court granted operator’s motion for summary judgment.
 - On appeal, the Pennsylvania Superior Court held that the traditional rule of capture “does not preclude liability for trespass due to hydraulic fracturing.”



What to Watch For



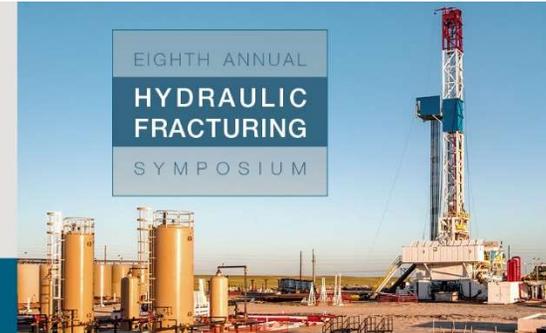
State Developments

- **California:** Pursuant to settlement, BLM to address alleged deficiencies in Bakersfield Resource Management Plan (RMP) and its NEPA analysis.
 - BLM published a public notice in August 2018 that it will prepare a supplemental EIS, which may lead to an amended RMP.
- **Ohio:** In March 2018, H.B. 562 was introduced in the Ohio House. It would prohibit horizontal well drilling in certain state and local parks. The bill has been referred to committee.
- **North Carolina:** Newly-reconstituted Oil & Gas Commission has held its first few meetings, and could eventually take action on hydraulic fracturing rules.



Speaker Biography

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Larry, a partner in Vinson & Elkins' Houston office, has been practicing environmental law full-time since 1981 and has an exceptionally broad range of environmental law experience that makes him particularly well suited to advise clients with multi-faceted environmental problems, such as those frequently encountered in large business transactions. Larry currently serves as the Environmental and Natural Resources Practice Group Leader, Co-Chair of the firm's Energy and Infrastructure practice group and Chair of the Shale and Hydraulic Fracturing Task Force. He is also a member of the firm's Climate Change practice group.

Larry has been recognized as the top environmental lawyer in the United States for the past eleven years by *United States Lawyer Rankings*. He has also been recognized as one of the best environmental lawyers in the nation in the most recent edition of *Best Lawyers in America*®; one of the best environmental law attorneys in Texas on the "Texas Super Lawyers" list published in *Texas Monthly*, and by *Chambers & Partners* in its recent guidebook on *America's Leading Lawyers for Business*.

The background image shows an oil field under a clear blue sky. On the left, there are several large, tan-colored cylindrical storage tanks with metal ladders. In the center and right, a tall drilling rig with a red and white lattice structure is visible. The rig has a blue section near the top and is connected to a white base. The ground is a mix of dirt and gravel. The overall scene is industrial and well-lit.

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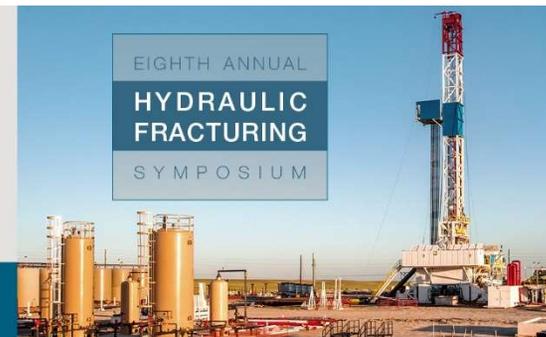
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LITIGATION UPDATE

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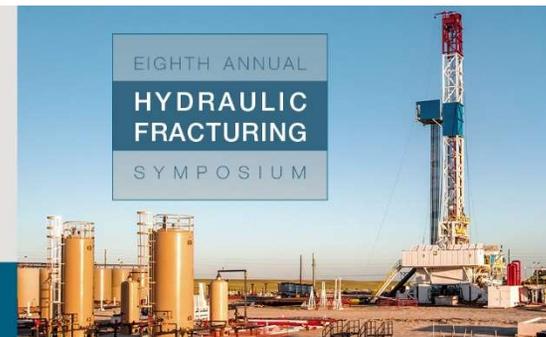
Litigation

Presentation Overview



- Royalty Claims & Class Action Update
- Retained Acreage
- Lease Assignments
- Offset Wells
- Frac Hits (Vertical Operators vs. Horizontal Operators)
- Seismicity Lawsuits

Royalty Claims & Class Action

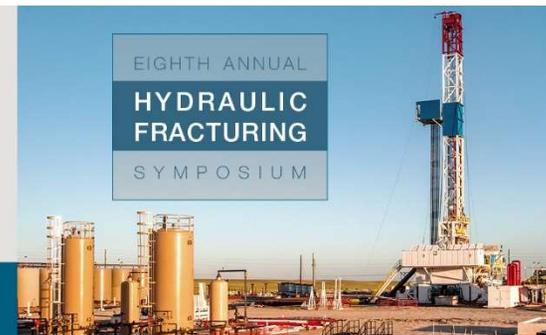


Why Do We See a Continued Rise in Royalty Litigation?

- Key factors
 - Large number of shale plays across the country
 - Specially-negotiated leases
 - Moving the valuation point
 - Special pricing provisions
 - No-deduct and add-back clauses
 - Continued uncertainty in the law on “marketable condition”
 - New focus on “untimely payments”

Royalty Claims & Class Action

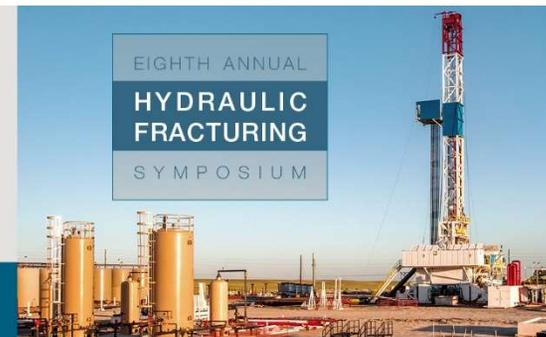
Gas Claims



- Gas claims
 - Post-production costs and “deducts”
 - Two related questions
 - Where is the proper valuation point for the gas?
 - What off-lease costs are deductible in determining royalty values?
 - Texas
 - The general “at the well” rule
 - Impact of a “proceeds” royalty standard – the *Hyder* case
 - Impact of affiliate sales on “proceeds” determination
 - No-deduct clauses / add-back clauses

Royalty Claims & Class Action

Gas Claims



- Gas claims
 - “Marketable condition”
 - Current Marketable Condition Scorecard
 - No Marketable Condition Rule
 - Texas, California, Louisiana, Michigan, Mississippi, North Dakota, Pennsylvania, Montana
 - Marketable Condition Rule Applied
 - Colorado, Kansas, Oklahoma, West Virginia, Wyoming
 - Uncertain
 - New Mexico, Arkansas
 - Uncertainty as to the meaning of “marketable condition”
 - Uncertainties in Kansas
 - Uncertainties in Oklahoma

Royalty Claims & Class Action

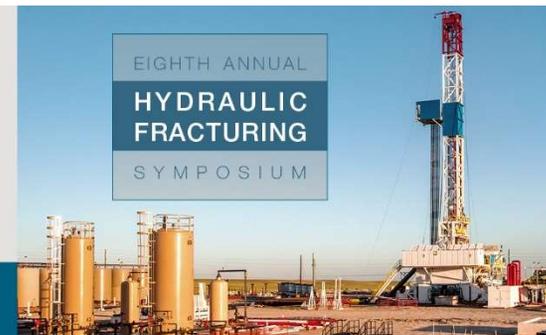
Gas Claims



- Gas claims
 - Pricing Issues
 - Multi-prong pricing standards
 - Cherry-picking from multiple sales contracts and “best price reasonably possible.”

Royalty Claims & Class Action

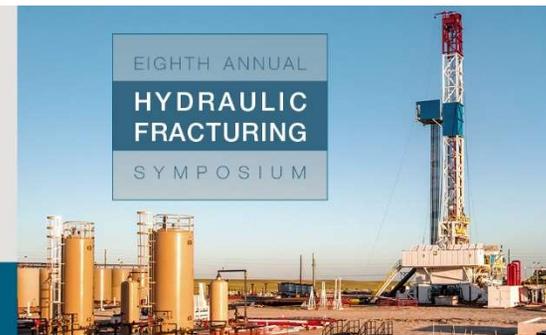
Recent Tenth Circuit Decision – New Mexico



- *Anderson Living Trust v. Energen Resources Corp.*, 886 F.3d 826 (10th Cir. 2018).
- *10th Circuit held that marketable condition rule does not apply in New Mexico.
 - Under New Mexico law, producer has duty to market the gas for the benefit of royalty owner but that duty does not prohibit it from deducting proportionate share of post-production costs.
 - Question not certified to New Mexico Supreme Court.
 - Relied on earlier 10th Circuit decision in *Elliott Indus. Ltd. P’ship v. BP Am. Prod. Co.*, 407 F.3d 1091 (10th Cir. 2005).
 - Leases set basis for royalties as the “market value at the well” or the “prevailing field market price.”

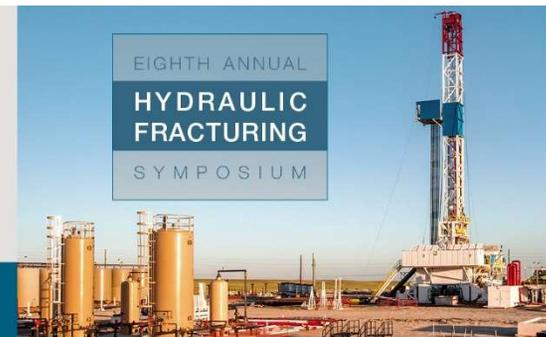
Royalty Claims & Class Action

Introduction to Royalty Class Action



- Plaintiffs continue to aggressively pursue royalty underpayment claims using class actions, particularly in marketable condition states
- Recent settlements
 - Chieftain v. XTO Energy -- \$110 million (2018, Fed. – Okla. Eastern)
 - Brown v. Access Midstream Partners -- \$ 8 million (2018, Federal – Penn. Middle)
 - Strack v. Continental -- \$50 million (2018, Okla. – Blaine County)
 - Fitzgerald v. Chesapeake -- \$119 million (2015, Okla. – Beaver county)
 - Chesapeake and Total reached global settlement of over 13k claims for \$52.5 million (2016, Tex. – Tarrant, Dallas, and Johnson Counties)

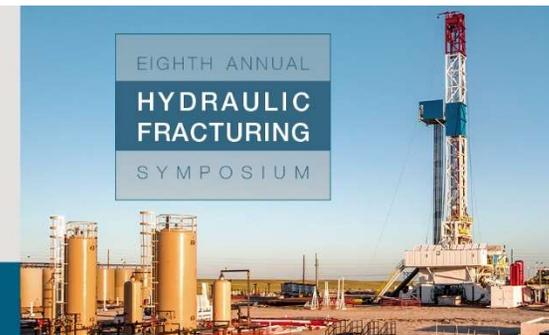
Royalty Claims & Class Action



Certification in Royalty Class Actions

- General certification principles
 - *Wal-Mart's* “One-Stroke” Commonality Rule and *Tyson Foods’* Predominance Rule
 - Tenth Circuit’s 2013 *XTO* decisions
 - “Ascertainability”
- Recent decisions
 - Texas
 - *Seeligson v. Devon*
 - Oklahoma
 - *Strack v. Continental*
 - *Whisenant v. Strat-Land*
 - Arkansas
 - *Hicks v. Southwestern Energy*

Retained Acreage

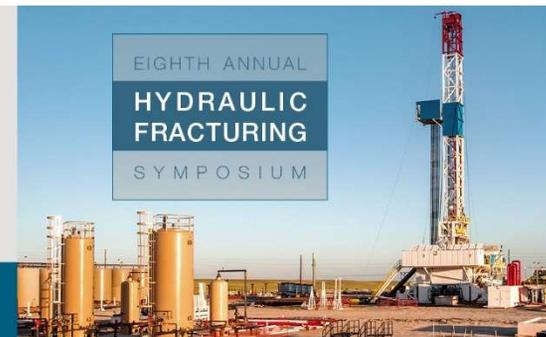


Recent Decisions

- *XOG Operating, LLC v. Chesapeake Expl. Ltd. P'ship.*, No. 15-0935 (Tex. Apr. 13, 2018).
- *Endeavor Energy Resources, L.P. v. Discovery Operating, Inc.*, 15-0155 (Tex. Apr. 13, 2018).
- Main takeaways
 - Lease language will be interpreted in the context of the regulatory environment in which producers operate
 - The language chosen matters—choose language carefully in defining what acreage is retained during the secondary term of the lease

Lease Assignments

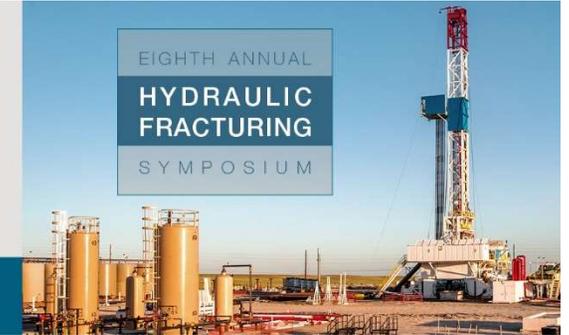
Pending Texas Supreme Court Decision



- *Barro-Shaver Resources Co. v. Carrizo Oil & Gas, Inc.*
 - BSR sought to assign a farm out agreement, but when it approached Carrizo, Carrizo demanded \$5MM to consent.
 - Trial court asked jury if, as a matter of industry custom, a “silent” consent to assignment provision implies a standard of reasonableness.
 - The jury found for BSR based on industry custom.
 - The Court of Appeals reversed, finding the agreement was unambiguous and should have been construed as a matter of law.
 - Supreme Court granted review; briefing complete and oral argument set for December.

Offset Wells

Recent Decision



- Recent Texas Supreme Court decision in *Murphy Exploration & Production Co. — USA v. Adams*, No. 16-0505 (June 1, 2018), determined that an offset-well clause did *not* require that the offset well be drilled to prevent drainage. 5-4 split decision.
 - The parties agreed that the 2009 lease contemplated horizontal shale drilling.
 - The Court partially based its decision on an informed view of the lease language, recognizing that shale reservoirs do not present the same drainage concerns as conventional, high-permeability formations.
 - The lease at issue contained bespoke language—this decision will not apply universally to all offset-well clauses.
 - A motion for reconsideration is pending.

Frac Hits

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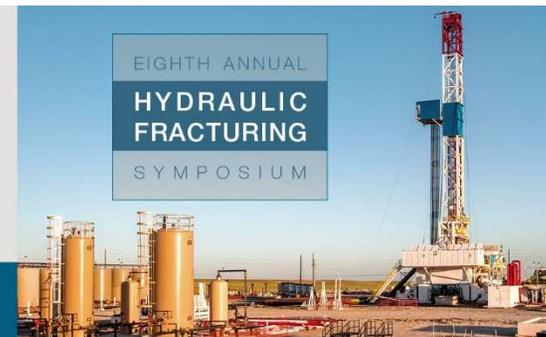


Overview

- Vertical Operators vs. Horizontal Operators
- A frac hit is interference with existing producing wells as a result of new hydraulic fracturing in neighboring wells.
- Vertical well operators refer to the phenomenon as “well bashing,” because a frac hit from a nearby horizontal well can diminish or altogether destroy existing production.

Frac Hits

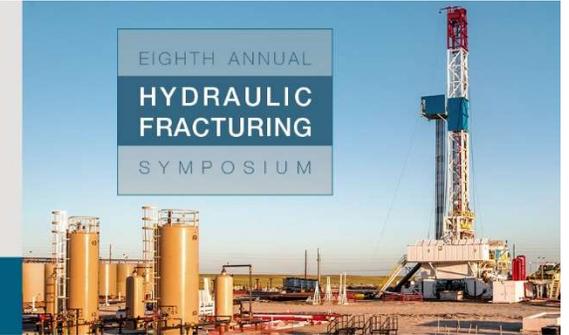
Claims



- Horizontal well operators face the threat of lawsuits for negligence and trespass.
- Vertical well owners have successfully tried such cases in Oklahoma—though the cases may have been economic losses to the plaintiffs. *E.g., H&S Equipment Inc. v. Felix Energy LLC*, No. 5:15-cv-01244 (W.D. Okla.).
- Unlike other subsurface or formation damage lawsuits, the potentially-tortious act is an injection of fluid into a reservoir, so the Rule of Capture may not apply.
- Unlike royalty or development lawsuits, it is the frac job, itself, that leads to the litigation, raising technical issues of fact, such as well fluid composition and fracture reach.

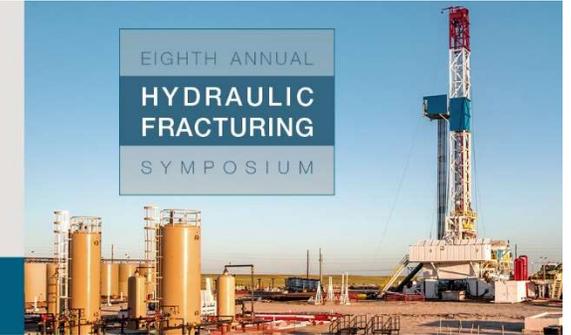
Frac Hits

Who are the plaintiffs?



- Three types of plaintiffs
 - Vertical operators in individual actions
 - Class action plaintiffs – lawyer-driven
 - Well Trolls – speculators purchasing vertical wells in areas of horizontal drilling in an attempt to exploit settlements from the horizontal operators

Seismicity Lawsuits



Overview

- Earthquake activity in Oklahoma has subsided—Oklahoma efforts to curtail disposal injection appear successful.
- No recent new seismicity lawsuits from recent seismic activity, although still some pending live cases stemming from damage as early as 2011.
- Class action trial against New Dominion resources delayed pending class certification appeal.
- Pawnee Nation withdrew tribal suit and filed similar claims in federal court. No official comment on reason for withdrawal, but any judgment in tribal court likely faced significant enforceability challenges, and damage claim only totaled \$400,000.

Speaker Biography

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Guy is a skilled trial lawyer who has extensive experience representing companies in the energy industry in all types of commercial disputes, both domestically and internationally, in state and federal courts, and in arbitration.

In particular, he has defended numerous royalty litigation cases across the nation. Dubbed by clients as “*absolutely first rate—head and shoulders above opposing counsel,*” and “*a wonderful litigator—he works efficiently and produces results*” in the 2014 edition of *Legal 500 U.S.*, he is also recognized as one of America’s leading lawyers in the area of energy litigation, and is considered to possess “*excellent analytical skills,*” and to be “*very persuasive in the courtroom*” in *Chambers USA*. Guy chairs Vinson & Elkins’ Energy Litigation Practice Group.

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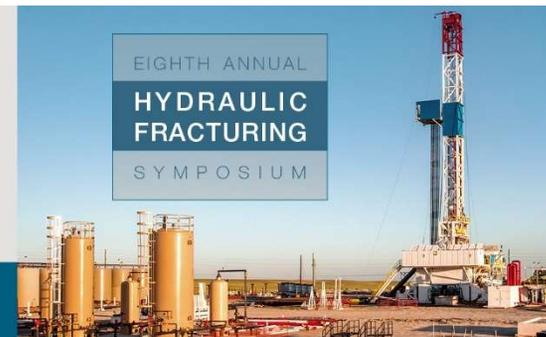
SAFETY/OSHA

Silica Standard Now Applies to Hydraulic Fracking



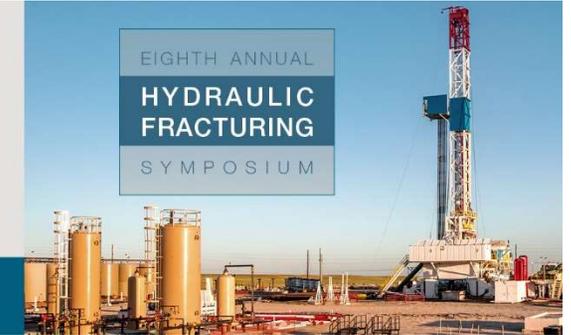
- June 23, 2016: Standard went into effect: The Permissible Exposure Limit (PEL) for respirable crystalline silica is reduced from 100 to 50 $\mu\text{g}/\text{m}^3$ (micrograms per cubic meter).
- June 23, 2018: Employers required to comply with most obligations of the standard except engineering controls. Medical exams must be offered to employees exposed above the PEL for 30 or more days.

Coming soon



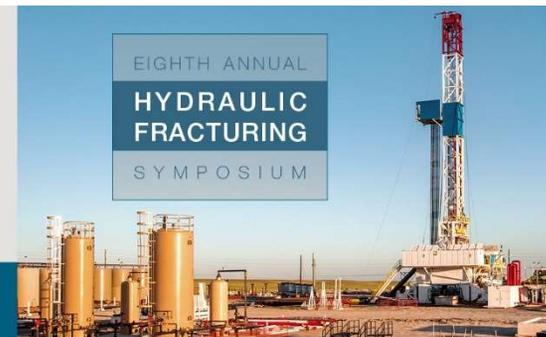
- June 23, 2020: Medical exams must be offered to employees exposed above Action Level ($25 \mu\text{g}/\text{m}^3$) for more than 30 days.
- June 23, 2021: Employers are required to comply with requirements for engineering controls to limit exposures to the new PEL.

It's Not Going Away



- December 22, 2017: D.C. Circuit rejected challenges to the OSHA standard.
- OSHA has been enforcing standard in the construction industry since September 23, 2017 and issuing citations.
- *Inadequate or absent air monitoring*
- *Inadequate or absent written exposure control plans*
- *Failure to provide training*
- *Failure to provide respiratory protection*
- *Medical Surveillance program issues*

NIOSH Field Studies – Hydraulic Fracturing High Levels of Respirable Crystalline Silica



Sources:



Side fill ports

vehicle traffic



transfer belts

Silicosis Lawsuits

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The Contractor Problem

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When contractors assume control of the manner and means of performing the “work”, they become liable for employee injuries through their failure to use reasonable care in exercising that control.

The Ostrich Solution

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The following activities are OK



- Ordering a subcontractor to start and stop work.
- Posting a generic safety plan.
- Conducting safety meetings for your own employees.
- Requiring subcontractors to conduct safety meetings.
- Inspecting project to determine progress, compliance, and other issues.
- Requiring subcontractors to adhere to OSHA regulations.
- Evaluating and investigating subcontractors before engaging them.

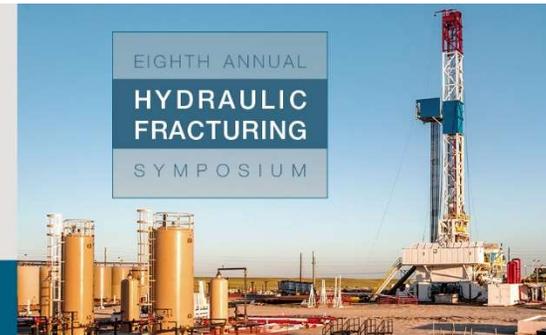
Other ways to avoid liability



- Vet your contractors carefully
- Get contractual commitments from your contractors that they will comply with OSHA standards
- Indemnification clauses
- Obtain workers compensation coverage for subcontractor employees

Speaker Biography

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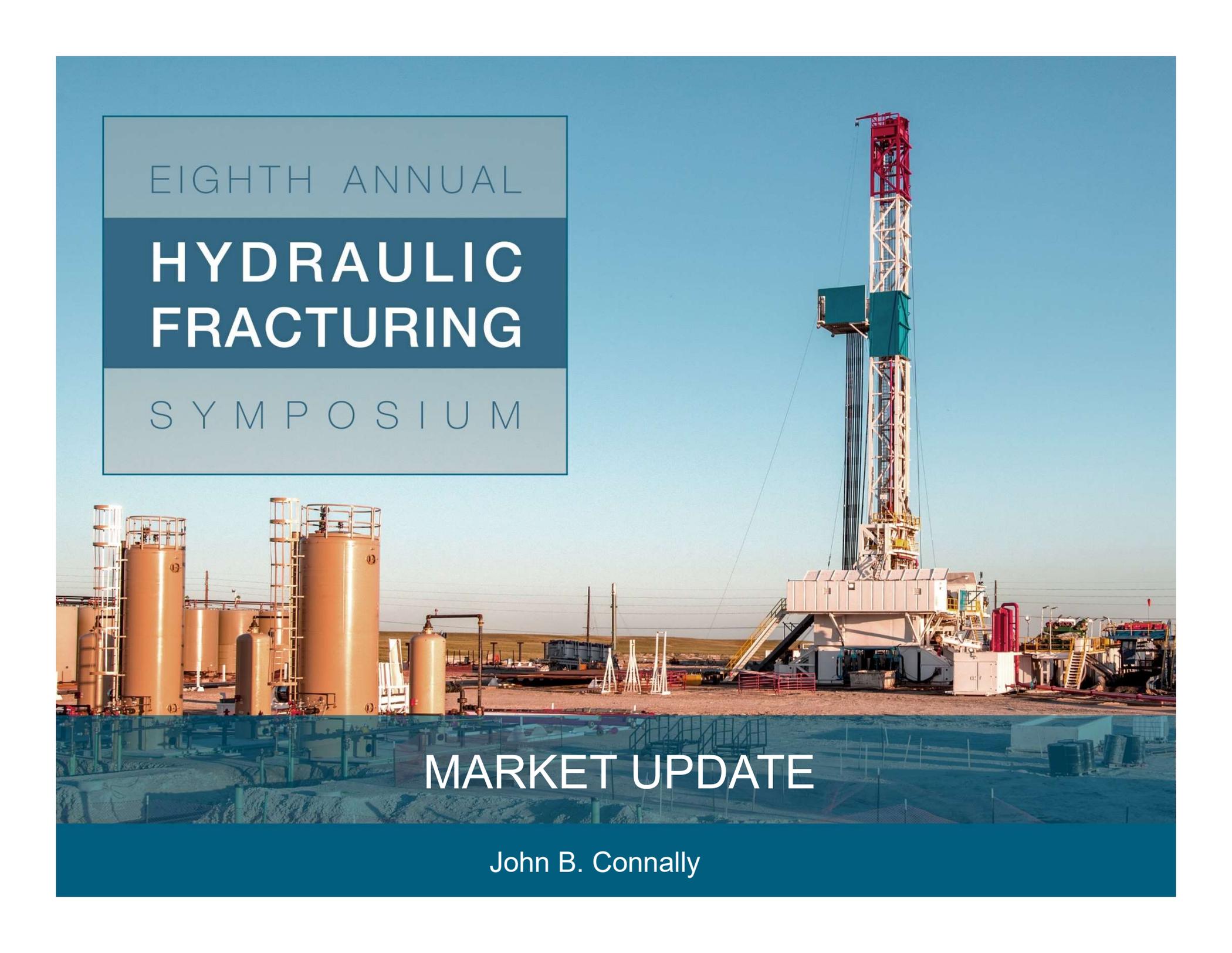


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Chris's practice is primarily devoted to the litigation of employment matters on behalf of public and private employers. In addition to his trial practice, Chris's three years as an assistant federal public defender have given Chris a unique vantage point when advising clients facing governmental investigations. Chris represents companies in OSHA and MSHA investigations including investigations into fatalities and serious injuries. In addition to defending companies against MSHA "unwarrantable failure" and discrimination claims, Chris has advised clients on issues related to compliance and training and frequently authors content on OSHA and MSHA developments. Chris also has advised clients on Dodd-Frank MSHA reporting obligations.

The background image shows an industrial oil field under a clear blue sky. On the left, there are several large, tan-colored cylindrical storage tanks with metal ladders. In the center and right, a tall drilling rig with a red and white lattice structure is visible. The ground is a mix of dirt and gravel. The overall scene is brightly lit, suggesting a clear day.

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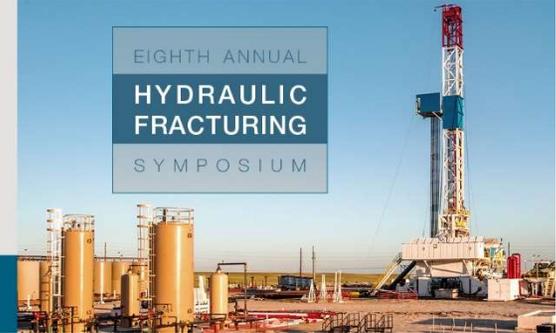
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MARKET UPDATE

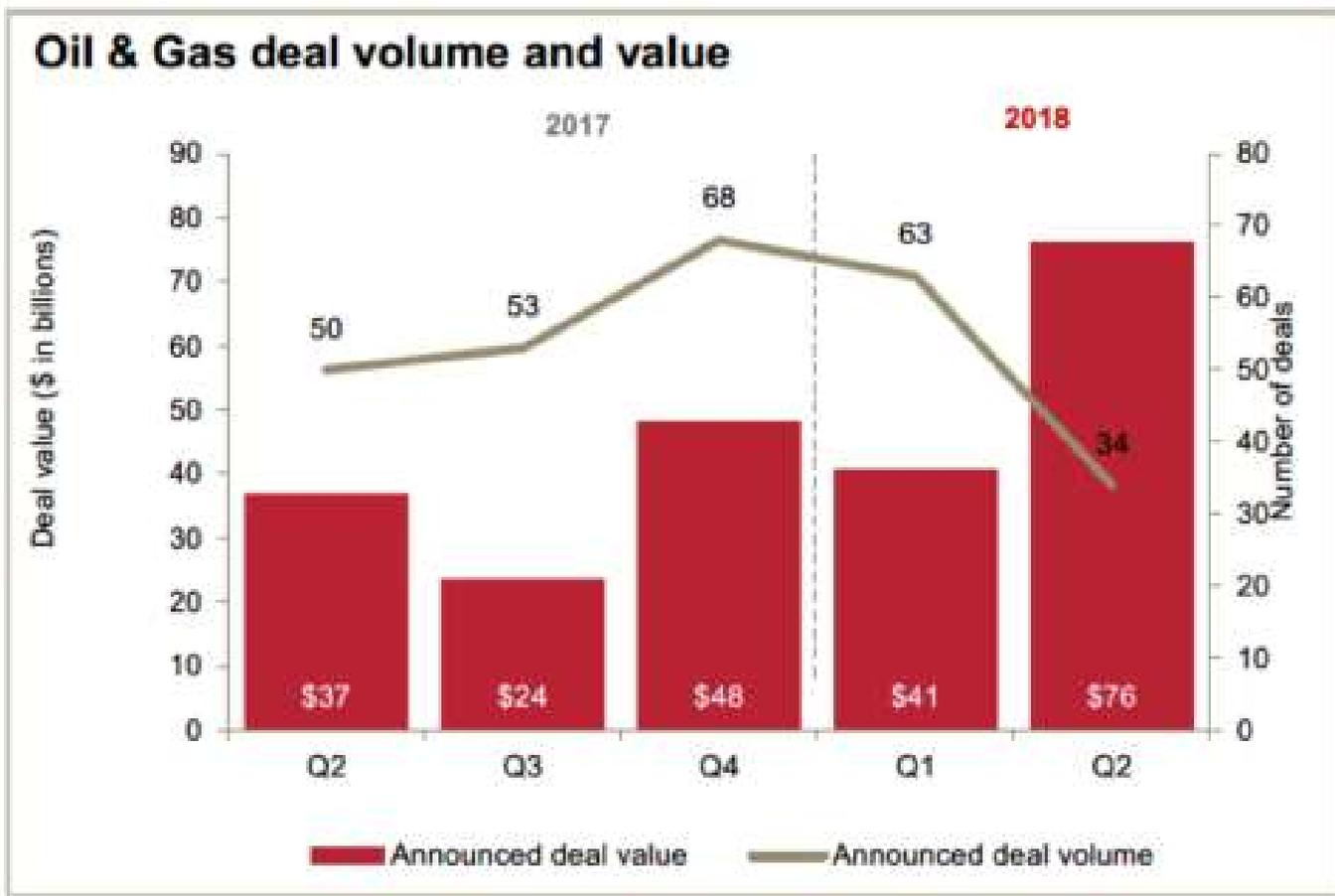
John B. Connally

TRENDS IN OIL & GAS

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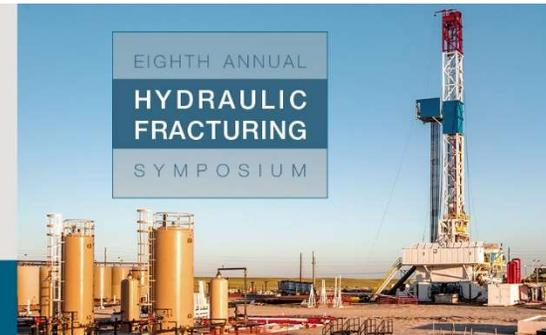
2Q18



Source: IHS Markit; PwC Deals US Oil & Gas Deal Insights year-end 2Q18

TRENDS IN OIL & GAS

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2Q18

2Q18 Largest transactions

Announced date	Buyer	Seller	Transaction value (\$billion)	Sub-sector
2018-04-30	Marathon Petroleum Corporation	Andeavor	\$ 33.80	Downstream
2018-05-17	Williams Companies, Inc.	Williams Partners L.P.	\$ 15.90	Midstream
2018-05-18	Enbridge Incorporated	Enbridge Energy Partners, L.P.	\$ 5.29	Midstream
2018-06-06	Global Infrastructure Partners	Devon Energy Corporation; EnLink Midstream LLC; EnLink Midstream Manager, LLC; EnLink Midstream Partners LP	\$ 3.13	Midstream
2018-04-26	EQT Midstream Partners, LP	Rice Midstream Partners LP	\$ 2.66	Midstream
2018-04-09	Morgan Stanley; Morgan Stanley Infrastructure Partners; North Haven Infrastructure Partners II LP	Brazos Midstream	\$ 1.75	Midstream
2018-04-26	EQT Midstream Partners, LP	EQT Corporation	\$ 1.52	Midstream
2018-06-29	Ascent Resources, LLC	CNX Resources Corporation; Hess Corporation; Undisclosed company(ies); Utica Minerals Development, LLC	\$ 1.50	Upstream
2018-06-19	Cheniere Energy, Inc.	Cheniere Energy Partners LP Holdings, LLC	\$ 1.24	Midstream
2018-05-10	Shell Midstream Partners, L.P.	Royal Dutch Shell plc	\$ 1.22	Midstream
2018-05-09	AL Midcoast Holdings, LLC	Enbridge (U.S.) Inc.; Enbridge Incorporated	\$ 1.12	Midstream
2018-06-18	Cox Oil, LLC	Energy XXI Gulf Coast Inc.	\$ 1.01	Upstream

Source: PwC Deals US Oil & Gas Deal Insights year-end 2Q18

TRENDS IN OIL & GAS

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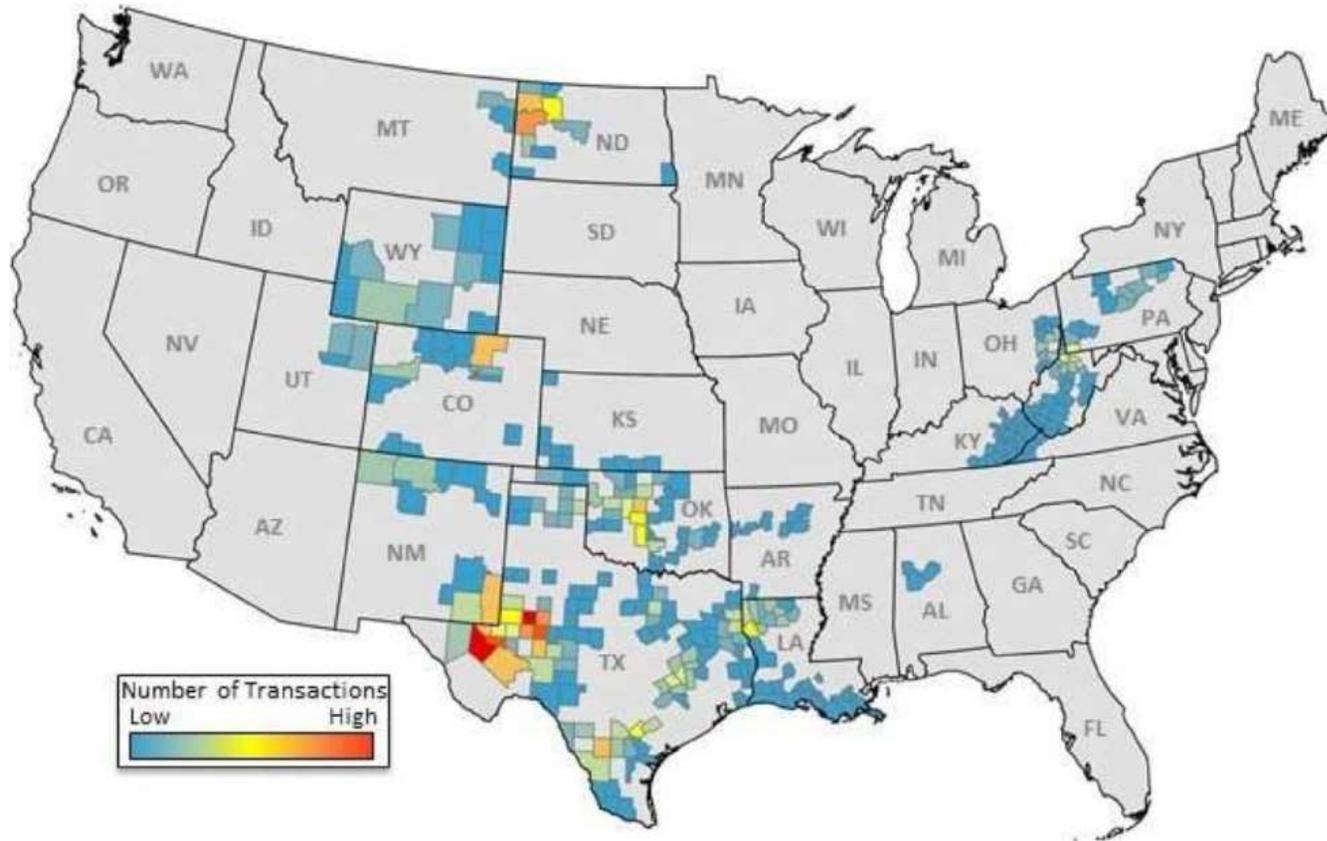


Figure 2: 2013-2018 heat map of number of transactions (Source: PLS M&A Database)

Source: Opportune LLP – Drilling Down A&D Valuation Trends

TRENDS IN OIL & GAS

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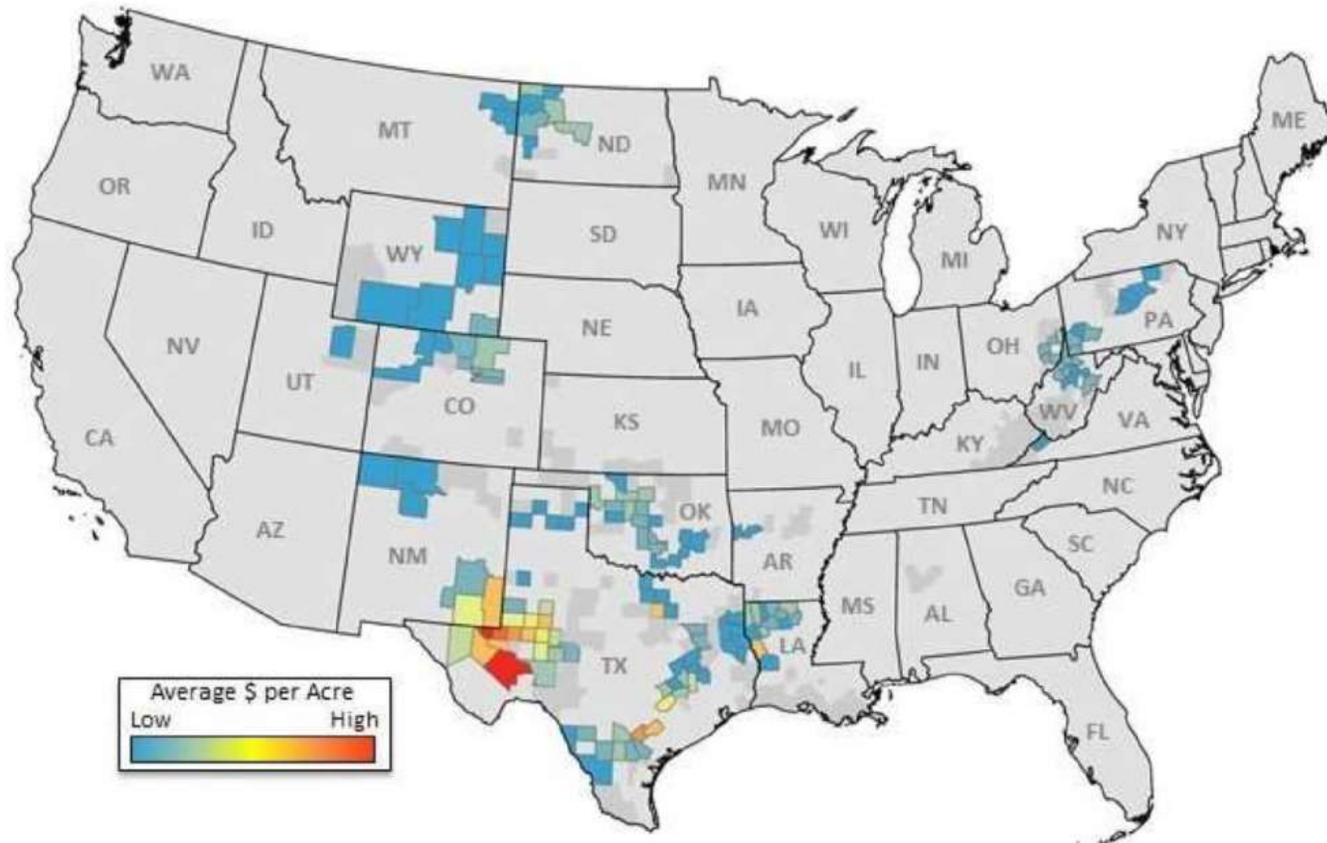
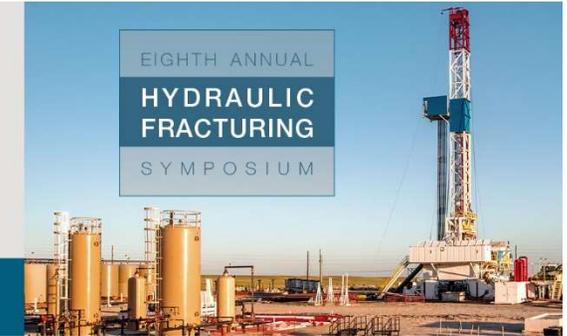


Figure 5: Average \$/acre heat map (Source: PLS M&A Database)

Source: Oppertune LLP – Drilling Down A&D Valuation Trends

TRENDS IN OIL & GAS



1H18

Q1 – Domestic Upstream

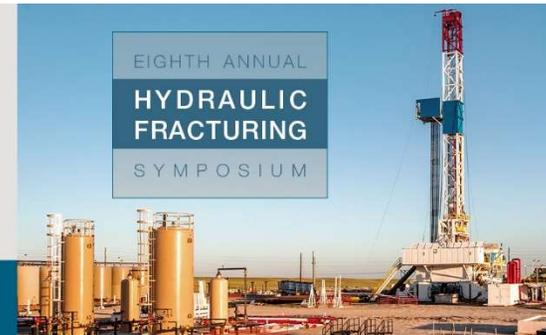
- The upstream segment remained active. Deals worth roughly \$22 billion were announced
- M&A shale activity registered 71 deals with a combined value of \$17 billion

Q2 – Domestic Upstream

- Upstream segment saw a decrease in total deals worth nearly \$8.7 billion, a 45% decrease compared to \$19.4 billion in Q2 2017
- M&A shale activity declined to 60 deals with a combined value of \$6.7 billion, a decrease of 15% in the number of deals and 61% in deal value compared to Q1 2018
 - Year-on-year comparison shows a decrease of 24% in the number of deals and 53% in deal value in Q2 2018, compared to 79 deals with a combined value of \$14.2 billion in Q2 2017
- M&A shale activity was dominant in Texas, reporting the highest number of deals with 28 and the biggest share of total deal value of \$3.7 billion

TRENDS IN OIL & GAS

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1H18

- Global oil and gas mergers and acquisitions across all sectors topped \$269.5 billion in the first half of 2018 compared to \$226.1 billion in the same period of 2017

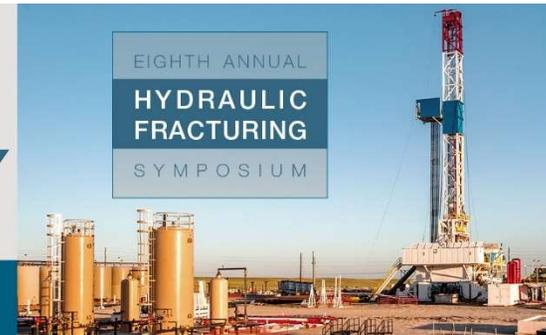
Area	Sector	1Q17	2Q17	3Q17	4Q17	1Q18	2Q18
USA	Upstream	\$25.1	\$19.5	\$12.3	\$10.1	\$22.0	\$8.7
Canada	Upstream	\$25.0	\$1.9	\$2.9	\$2.1	\$1.5	\$6.6
International	Upstream	\$38.5	\$8.7	\$18.8	\$28.7	\$9.0	\$9.3
Global	Oilfield Service	\$9.1	\$7.8	\$10.9	\$10.6	\$4.1	\$2.5
Global	Midstream	\$26.6	\$18.1	\$7.9	\$6.7	\$12.7	\$51.2
Global	Downstream	\$7.6	\$11.7	\$3.0	\$17.9	\$12.4	\$41.5
Global	Power & Utilities (Non-Renewable)	\$16.2	\$2.8	\$50.1	\$30.4	\$38.5	\$33.7
Global	Power & Utilities (Renewable)	\$2.5	\$3.1	\$0.9	\$6.3	\$3.6	\$6.6
Global	LNG	\$0.8	\$1.0	\$1.5	\$1.6	\$0.7	\$5.2
	Total	\$151.4	\$74.7	\$108.3	\$114.6	\$104.3	\$165.2

Renewables = Solar, Wind, Geothermal, Hydro and Tidal

Source: Drillinginfo, Inc.

DOMESTIC UPSTREAM DEAL VALUE BY TOP PLAY

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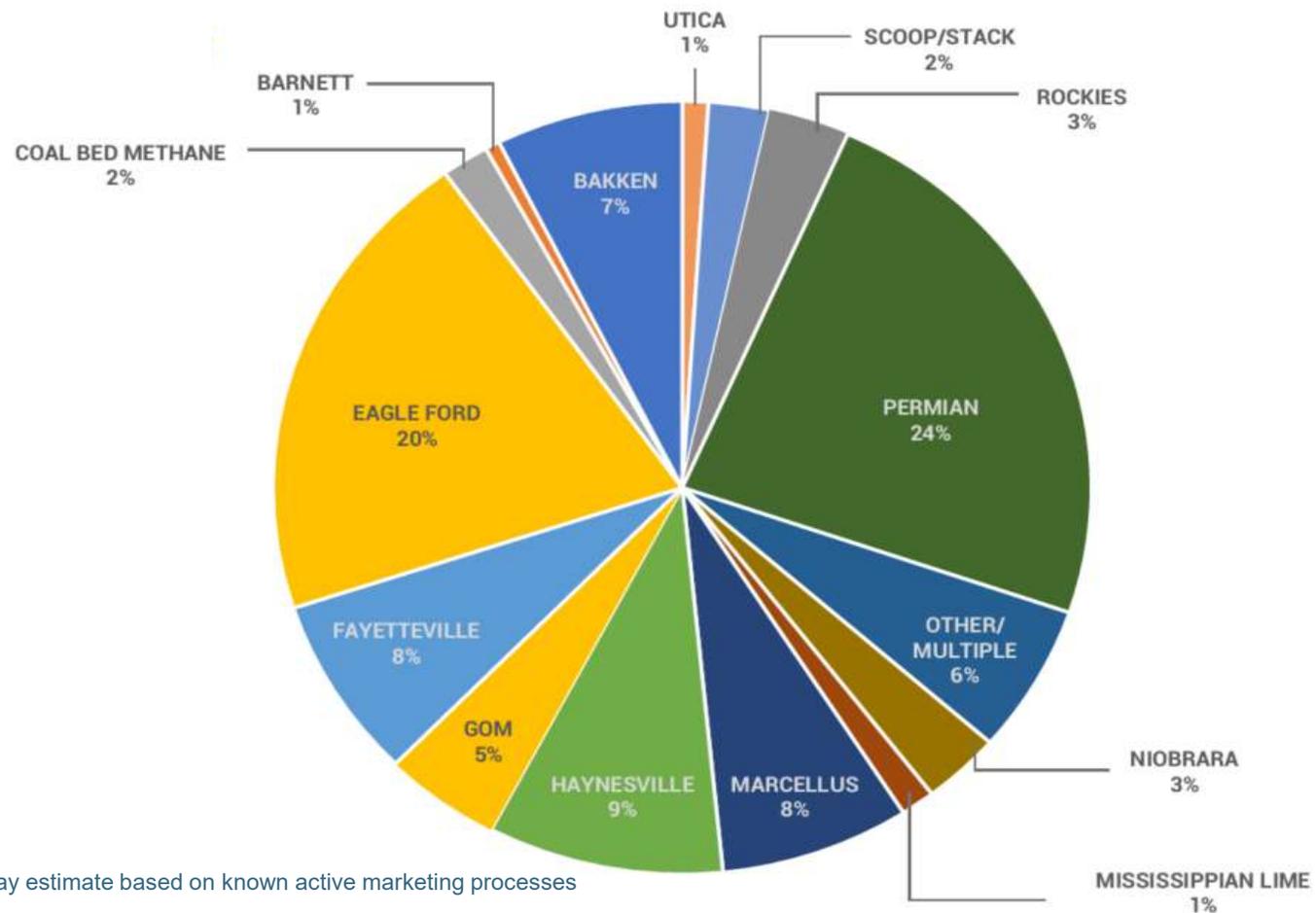
Value (\$billion) by Top Plays

Play	1Q17	2Q17	3Q17	4Q17	1Q18	2Q18	Total	%Total	%2Q18
Conventional	\$1.1	\$5.7	\$1.9	\$4.2	\$2.8	\$2.8	\$18.6	19%	32%
Utica	\$0.1	\$0.0	\$0.4	\$0.1	\$0.1	\$1.5	\$2.2	2%	17%
Bakken	\$0.2	\$0.0	\$2.0	\$0.4	\$0.0	\$1.4	\$4.0	4%	16%
Eagle Ford	\$3.7	\$0.8	\$0.4	\$1.0	\$3.3	\$1.1	\$10.2	10%	12%
Delaware Unconventional	\$13.7	\$1.2	\$0.6	\$1.3	\$1.8	\$0.7	\$19.4	20%	8%
Multiple/Other	\$0.1	\$0.9	\$0.6	\$0.8	\$2.5	\$0.6	\$5.7	6%	7%
Niobrara	\$0.1	\$0.0	\$0.3	\$1.6	\$0.1	\$0.3	\$2.4	2%	3%
Haynesville	\$0.0	\$0.1	\$0.6	\$0.0	\$0.0	\$0.1	\$0.9	1%	2%
Midland Unconventional	\$4.3	\$1.1	\$0.9	\$0.1	\$10.8	\$0.1	\$17.3	18%	1%
Barnett	\$0.1	\$0.0	\$0.2	\$0.0	\$0.6	\$0.1	\$0.9	1%	1%
Marcellus	\$0.8	\$9.6	\$0.3	\$0.4	\$0.0	\$0.0	\$11.1	11%	0%
SCOOP/STACK	\$0.9	\$0.0	\$4.1	\$0.1	\$0.0	\$0.0	\$5.1	5%	0%
Total	\$25.1	\$19.4	\$12.3	\$10.0	\$22.0	\$8.7	\$97.8	100%	100%

Source: Drillinginfo, Inc.

U.S. DEALS IN PLAY AS OF 2Q18

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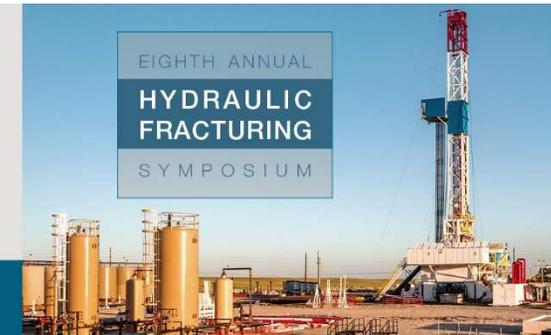


Deals in Play estimate based on known active marketing processes

Source: Drillinginfo, Inc.

DEAL TYPE

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- Royalty Markets rise to \$1.3 billion in 2Q 2018
- Corporate Mergers decline to \$1.1 billion in 2Q 2018

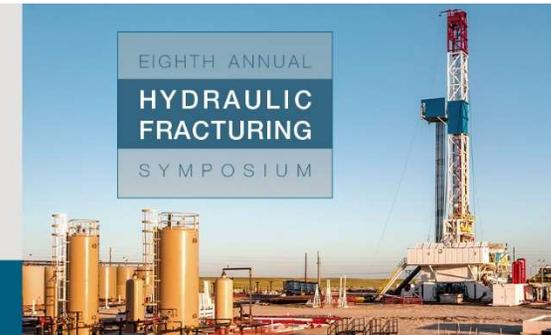
Value (\$billion) by Type

	1Q17	2Q17	3Q17	4Q17	1Q18	2Q18	Total	% Total	% 2Q18
Property	\$11.7	\$9.7	\$6.9	\$6.2	\$11.2	\$5.9	\$51.6	53%	68%
Royalty	\$0.4	\$0.2	\$0.3	\$0.5	\$0.2	\$1.3	\$2.8	3%	15%
Corporate	\$12.2	\$8.2	\$3.8	\$3.2	\$9.6	\$1.1	\$38.1	39%	13%
JV/Farm-out	\$0.3	\$1.0	\$0.6	\$0.0	\$0.2	\$0.2	\$2.3	2%	3%
Acreage	\$0.6	\$0.4	\$0.7	\$0.3	\$0.8	\$0.2	\$2.9	3%	2%
Total	\$25.1	\$19.5	\$12.3	\$10.1	\$22.0	\$8.7	\$97.8	100%	100%

Source: Drillinginfo, Inc.

DEALS BY OIL AND GAS ASSET MIX

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Value (\$billion) and Counts by Commodity

	Q1 2017		Q2 2017		Q3 2017		Q4 2017		Q12018		Q2 2018	
	Value	Count	Value	Count								
Oil	\$20.2	53	\$3.4	31	\$4.3	33	\$7.3	40	\$16.2	32	\$4.6	30
Gas	\$1.5	10	\$13.9	17	\$2.6	20	\$1.3	8	\$1.7	13	\$2.4	9
Oil + Gas	\$3.4	27	\$2.2	30	\$5.4	27	\$1.6	24	\$4.1	38	\$1.7	26
Total	\$25.1	90	\$19.5	78	\$12.3	80	\$10.1	72	\$22.0	83	\$8.7	65
Oil	81%	59%	17%	40%	35%	41%	72%	56%	74%	39%	52%	46%
Gas	6%	11%	71%	22%	21%	25%	13%	11%	8%	16%	28%	14%
Oil + Gas	14%	30%	11%	38%	44%	34%	15%	33%	19%	46%	20%	40%
Total	100%	100%	100%	100%								

Commodity classification based on a 70% threshold of production

Source: Drillinginfo, Inc.

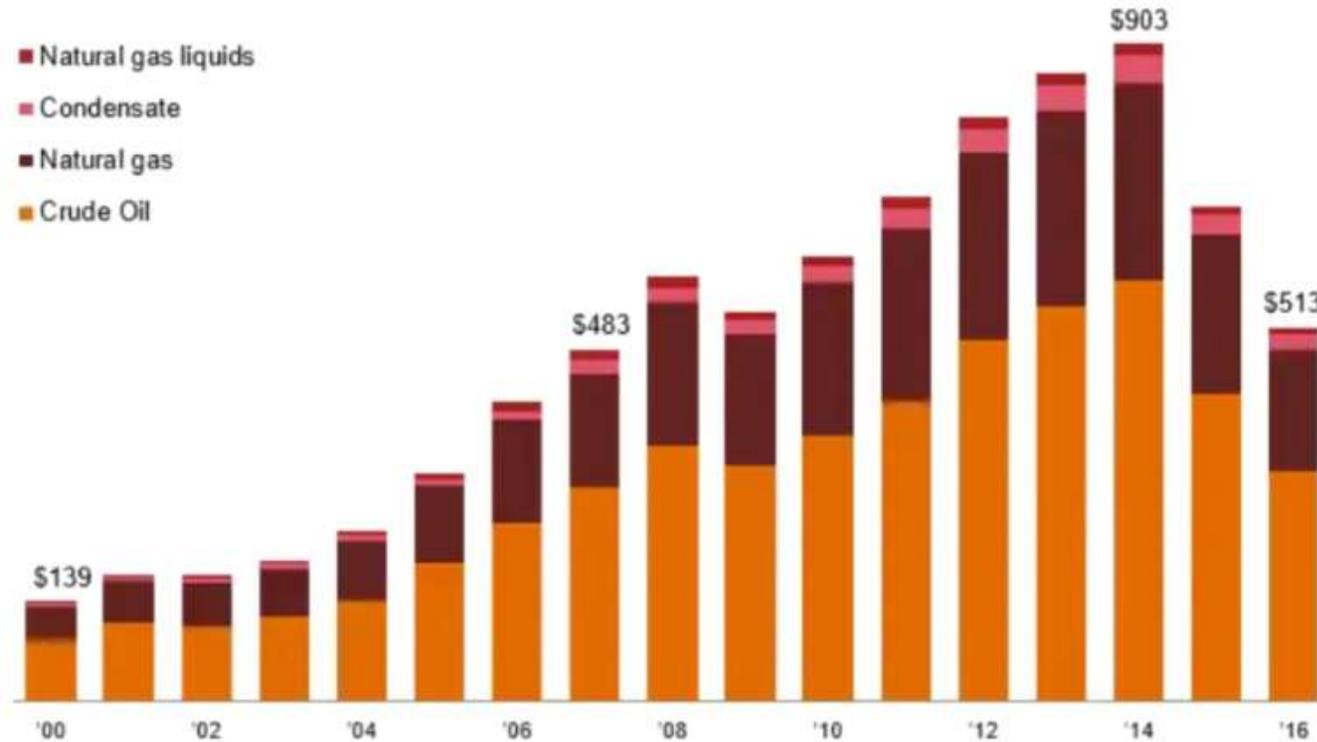
GLOBAL UPSTREAM CAPITAL INVESTMENTS

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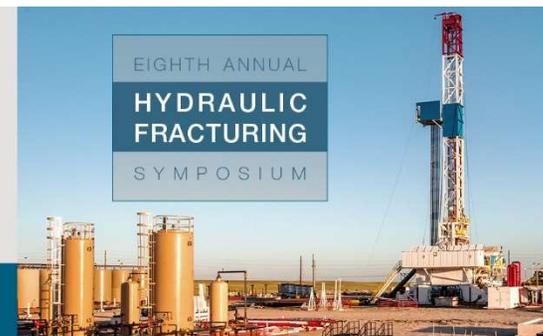
Global upstream capital investments in oil and gas

IN BILLIONS OF NOMINAL U.S. DOLLARS



Source: EIA; PwC Deals US Oil & Gas Deal Insights year-end 2Q18

U.S. AND CANADA RIG COUNT



- U.S. oil rig count higher than a year ago when 744 oil rigs were active
- But since June, U.S. oil rig count held steady at above 860 rigs as crude prices in the Permian have dropped due to a lack of pipeline infrastructure

Area	Last Count	Count	Change from Prior Count	Date of Prior Count	Change from Last Year	Date of Last Year's Count
U.S.						
Oil	9/28/2018	863	-3	9/21/2018	+113	9/22/2017
Gas	9/28/2018	189	+3	9/21/2018	0	9/22/2017
Miscellaneous	9/28/2018	2	+1	9/21/2018	+1	9/22/2017
Total	9/28/2018	1,054	+1	9/21/2018	+114	9/22/2017
Canada						
Oil	9/28/2018	122	-13	9/21/2018	+9	9/22/2017
Gas	9/28/2018	56	-6	9/21/2018	-44	9/22/2017
Total	9/28/2018	178	-19	9/21/2018	-35	9/22/2017

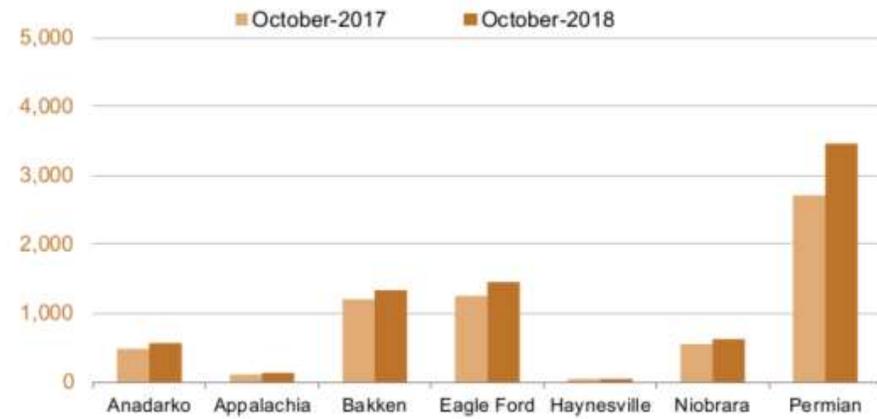
Source: Baker Hughes

U.S. OIL AND GAS PRODUCTION

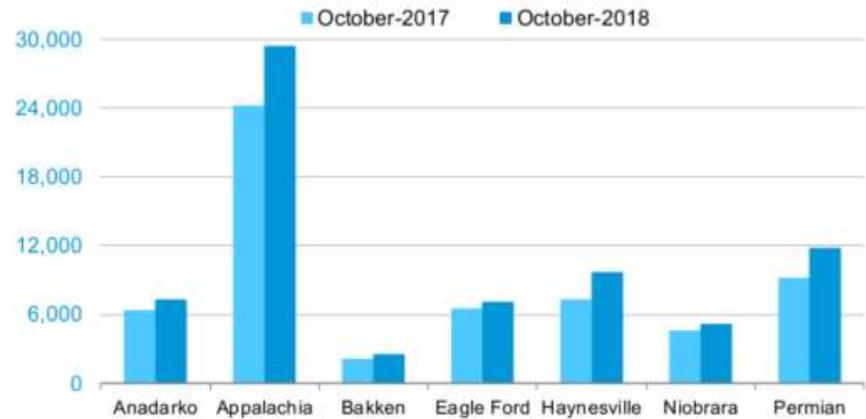
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Oil production
thousand barrels/day

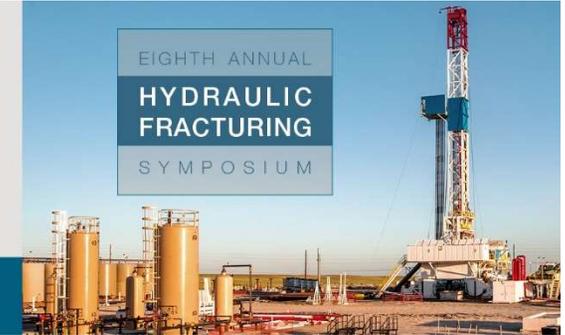


Natural gas production
million cubic feet/day



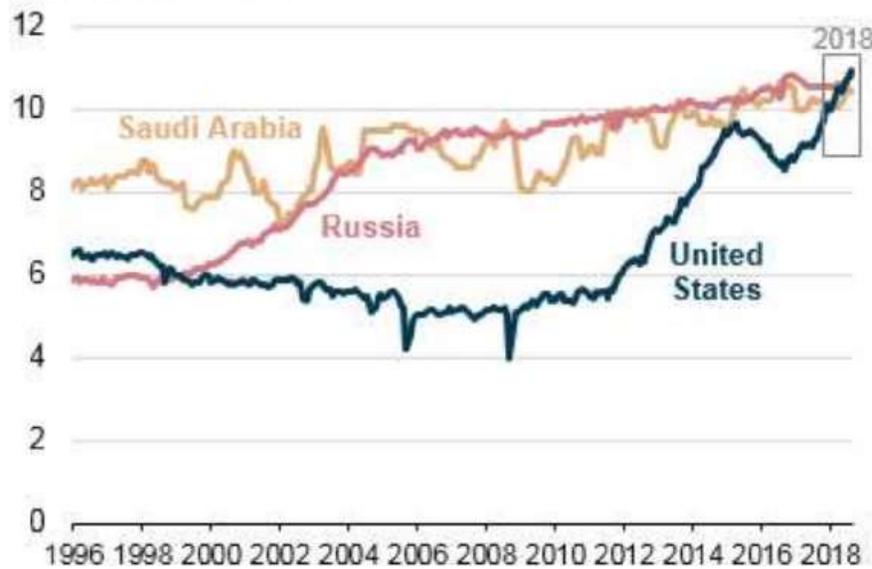
Source: U.S. Energy Information Administration, Drilling Productivity Report

U.S. CRUDE OIL PRODUCTION

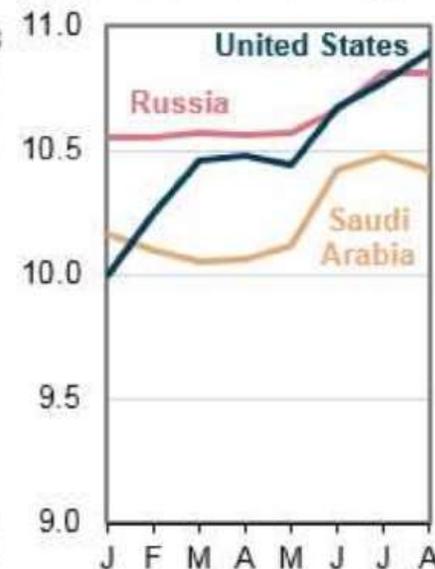


- U.S. is now the largest global crude oil producer, surpassing Russia and Saudi Arabia
- Recent growth is due to production increases in the Permian, Federal Offshore Gulf of Mexico and the Bakken

Monthly crude oil production (Jan 1994-Aug 2018)
million barrels per day

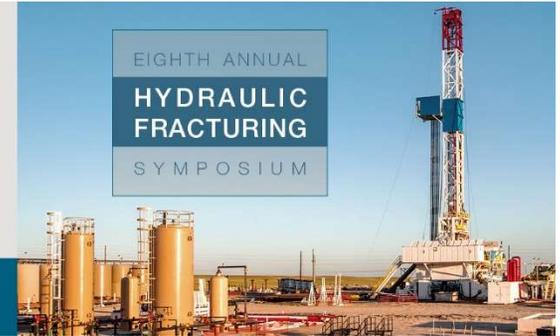


million barrels per day eia



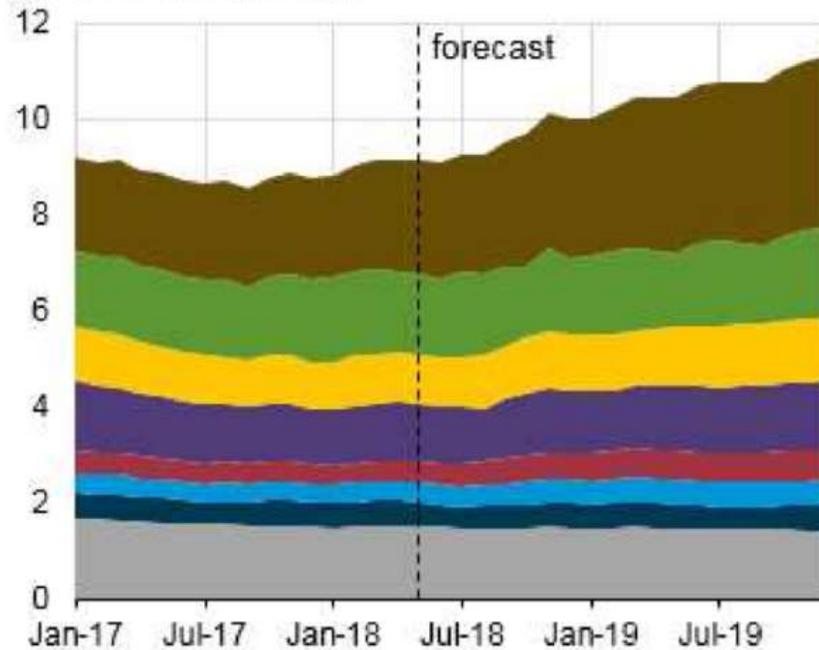
Source: U.S. Energy Information Administration, *Short-Term Energy Outlook*

U.S. CRUDE OIL PRODUCTION

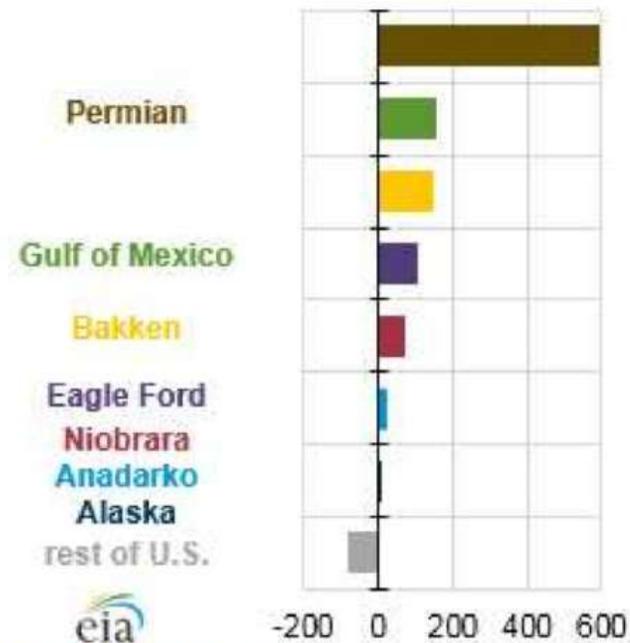


- Permian expected to account for more than half of U.S. crude oil production growth through 2019

Monthly U.S. crude oil production (Jan 2017-Dec 2019)
million barrels per day

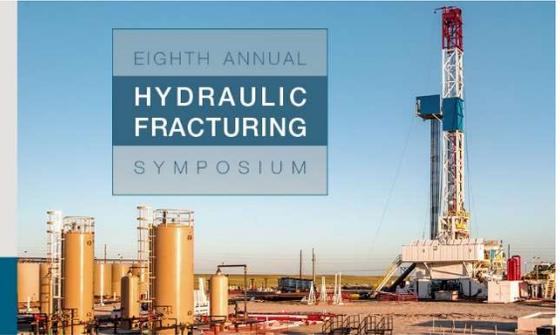


Projected change 2018-2019
thousand barrels per day



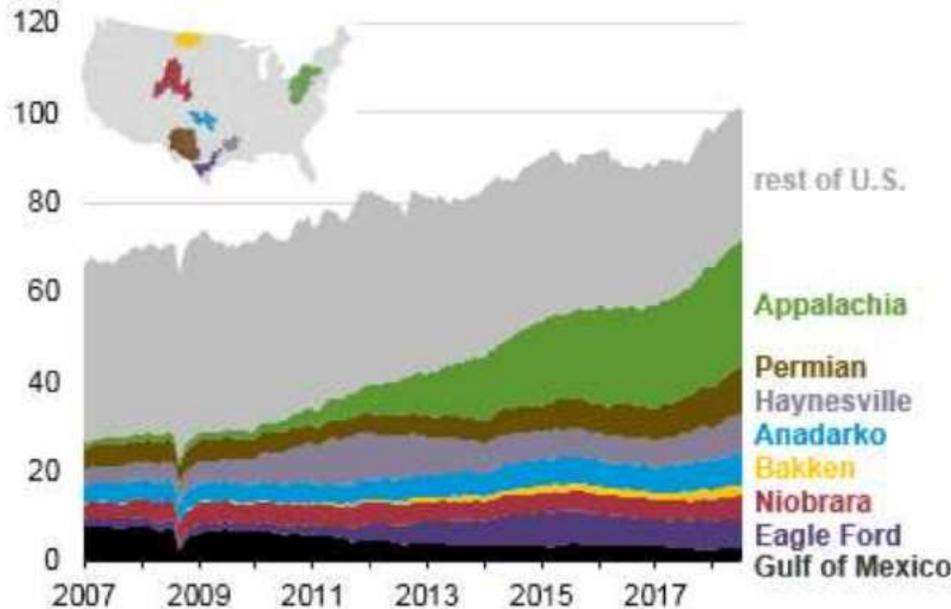
Source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, August 2018

U.S. NATURAL GAS PRODUCTION

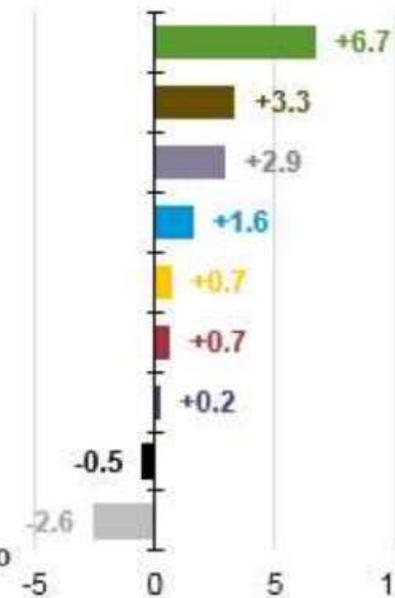


- U.S. gross production of natural gas more than 10% higher in 2018 compared with the same months in 2017
- Appalachia, Permian, Haynesville drive U.S. natural gas production growth

U.S. natural gas production (Jan 2007 - July 2018)
billion cubic feet per day

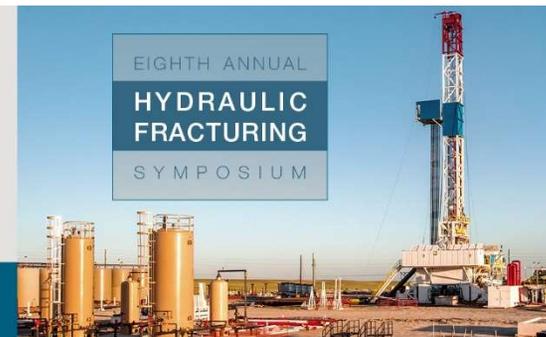


Change since July 2016
billion cubic feet per day



Source: U.S. Energy Information Administration, *Drilling Productivity Report*, *Natural Gas Monthly*, and *Short-Term Energy Outlook*

Speaker Biography



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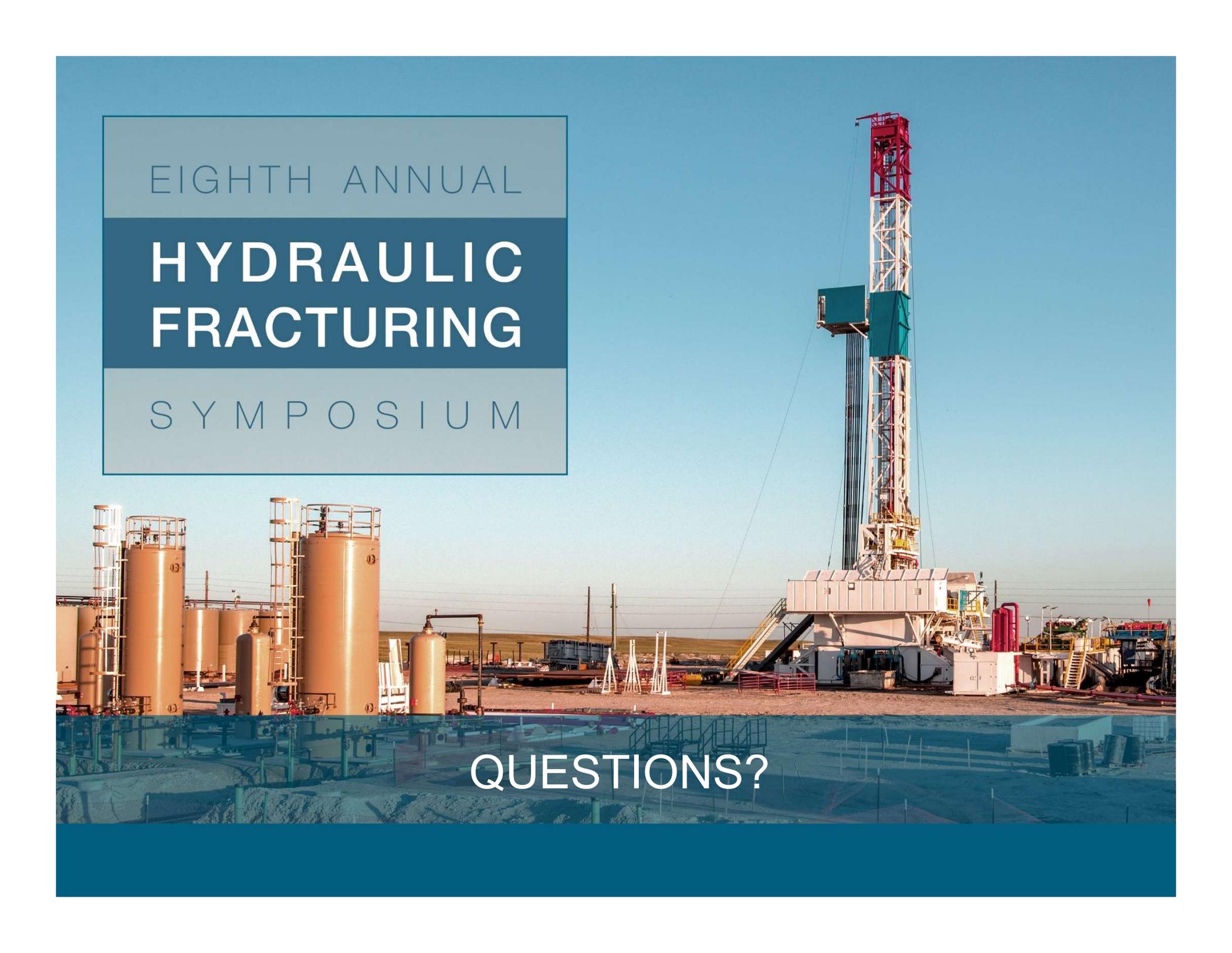
John B. Connally IV is a partner in the Houston office of Vinson & Elkins. He is co-head of the Energy Transactions and Projects practice group. John B.'s practice involves the representation of clients in domestic and international mergers and acquisitions, project development transactions, private equity investments, joint ventures, and a variety of energy matters.

John B. has spent his entire career with Vinson & Elkins, in both New York and Houston. He has worked on projects in more than 20 U.S. states and more than 25 countries. John B. received his J.D. with high honors from The University of Texas School of Law in 1997 (Chancellors; Order of the Coif; Texas Law Review) and graduated from Vanderbilt University with a B.A. in 1994 (Phi Beta Kappa; Founder's Medal). He is admitted to practice law in Texas and New York.

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QUESTIONS?

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