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UPSTREAM TEXAS

SPRING | SUMMER 2017

A PUBLICATION OF THE TEXAS
INDEPENDENT PRODUCERS AND
ROYALTY OWNERS ASSOCIATION

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> INDUSTRY PIONEERING CREATIVE APPROACHES TO OBTAIN WATER

ALSO INSIDE:

Feature:

Technology and Innovation
Advancements in the Industry

Feature:

Railroad Commission Initiative Aims to
Offer Regulatory Relief in the Oil Patch

Regulatory Profile:

Texas Railroad Commissioner Wayne Christian



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Welcome to this edition of *Upstream Texas*!

TIPRO is the voice of Texas' upstream sector and represents members by lobbying at the state and federal levels to ensure they can continue to explore for and produce oil and natural gas. As the official bi-annual magazine of the association, *Upstream Texas* features insights into the opportunities and challenges currently facing the Texas oil and gas industry, as well as profiles key industry players and regulators.

In this issue of *Upstream Texas*, learn more about new technologies being utilized by Texas producers to enhance oil and gas operations in the Lone Star State. For this special *Upstream* feature article, TIPRO speaks with innovative oil and gas companies that are developing revolutionary services geared towards improving E&P operations and boosting energy development. To see more, turn to page 6.

In addition, starting on page 8, discover how the oil and gas sector continues to adopt leading practices aimed at curtailing industry's usage of freshwater resources. In this feature story, read about how one TIPRO member, Pioneer Natural Resources Company, in particular is significantly reducing its freshwater needs for its operations in West Texas' Midland Basin.

Also inside this edition of TIPRO's magazine, Railroad Commission Chairman Christi Craddick offers an update on the commission's Texas Oilfield Relief Initiative. This initiative, announced in 2016, has improved efficiencies at the state's chief oil and gas regulatory body, while at the same time allowed the Railroad Commission to eliminate unnecessary regulatory requirements and ease administrative burden for the Texas oil and gas industry. Turn to page 14 to read more.

And, as always, this publication also features profiles of industry and state leaders, including: Texas State Representative Chris Paddie, page 17; Texas Railroad Commissioner Wayne Christian, page 18; and Lonestar Resources CEO Frank Bracken III, page 19.

TIPRO members, this is your magazine and we welcome your feedback. Please contact TIPRO's Director of Communications Kelli Snyder [ksnyder@tipro.org] or Content Strategist Susan Christmas [schristmas@naylor.com].

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TECHNOLOGICAL ADVANCEMENTS HELP STIMULATE INDUSTRY GROWTH DURING TIMES OF DOWNTURN

Allen Gilmer, Drillinginfo

CHAIRMAN – TEXAS INDEPENDENT PRODUCERS & ROYALTY OWNERS ASSOCIATION



GLOBAL SUPPLY AND DEMAND for crude is in the midst of being structurally shifted, thanks to one uniquely American

resource: unconventional oil. In wake of the sustained low-price environment, we've seen breakeven prices drop from what was once \$80 per barrel to the \$50s, while at the same time witnessing an increase of short cycle production from unconventional formations by nearly 100 percent. Three

overall factors have conspired to make the U.S. oil patch such a robust ecosystem. The first, and most important, is the sadly discounted (at least outside North America) capitalism/private ownership of minerals combination. The second is the emergence, beginning in the 1990s, of a professional class of oil and gas investor/lender offering myriad flavors of project, asset, and corporate financing. The last but most revolutionary factor feeding this trend is technology.

Let's talk about a combination of the first influence, capitalism, along with the last factor... technology.

Years back, I gave a talk to a previous energy minister of Argentina. I showed him and his staff five examples of plays in the U.S. that ramped from a handful of rigs to more than 200 rigs in the course of a year due to unconvensionals. Given that there were several economists in the room at the time, the little devil on my shoulder reminded them of the fact that this happened despite government "help," and that it didn't require the planning or direction of a single government economist. It required rule of law, sanctity of a contract embedded therein, low regulatory hurdles to start businesses and a bunch of people waving cash around, and you have what amounts to pure magic in countries with highly managed economies. Their response? "It can't happen here." Pity, really, that control meant so much more than the actual benefit of exploiting their world-class reserves.

This experience, and others, have made me really appreciate what we have in the United States... an astounding myriad of solutions to virtually every problem that might arise in the oil patch, because in a free market, "problem" really means "opportunity." How valuable has it been to the U.S. to have over 9,000 oil and gas producers? Over 10,000 oilfield service companies? This benefit has allowed our nation to build out an operational infrastructure that is unmatched globally. The economic minimum size of a field that can be exploited in the U.S. is an order of magnitude smaller than it is elsewhere. Know what makes this powerful? The log normal distribution of reserves. It's not linear. If you can produce something half as small as the next guy, the population of opportunities isn't twice as large. It's ten times as large. This is the very unusual world we live in. A world where tens of thousands of

people are thinking about how to do something a little bit better opens up opportunities that get magnified by the log normal rule of natural populations. This is the key. Without this, we wouldn't have had the field infrastructure, the gathering infrastructure and markets, the OFS infrastructure that makes unconventional hydrocarbons possible. Our American industry is built on the shoulders of free market capitalism. The rest of the world literally cannot compete. It is a textbook example of the power of distributed systems, each seeking to be a bit better than the next guy.

As an industry, we have collectively increased average per well production approximately 50 percent since 2013. Meanwhile, during that same time frame, the cost of drilling, completing, and stimulating these wells has dropped some 30-45 percent. This revolutionary benchmark is in large part thanks to the evolving technologies that are being utilized by producers.

In recent times, the technologies that have caught my attention have been smaller innovations with big results. For instance, diverter agents. These are things or chemicals you pump to plug up the end of the frac, forcing the frac to break in another direction. Cluster fracing and diverter agents serve the common purpose of focusing frac effort proximal to the wellbore. This change in focus AWAY from Stimulated Rock Volume (SRV) to INTENSITY of Stimulated Rock Volume (ISRV) is very significant. Commonly these wells produce at or more than wells targeting much bigger volumes. This means that it is that much more efficient at draining the hydrocarbon in place, usually as much as three to five times more capable. This, in turn, means that the recoverable resources that can be economically targeted should be that many times larger. If this is true, it's the biggest story of the 21st century.

Other things we are seeing that create step change productivity increases have been completion/stimulation method optimization as determined by microseismic data. Microseismic has found its sweet spot after years of over-promising and under-delivering when applied to three or so laterals from a single pad and more or less normalized acquisition geometries when comparing various methodologies initially. Given that there isn't a "one-size-fits-all" solution to every sort of rock type and condition, this needs to be done on an occasional basis during field development.

Production optimization across the board has been a great island of growth in the downturn, since analytics and better autonomous measurement tools can add noteworthy cash flow improvements.

We are blessed to live in amazing times, to work with amazing people, and to produce and monetize an amazing asset: the Texas and U.S. oil patch.

Keep it turning to the right! ■

TEXAS PRODUCERS EMBRACE FORWARD-THINKING STRATEGIES TO SHRINK WATER USAGE

Ed Longanecker

PRESIDENT – TEXAS INDEPENDENT PRODUCERS & ROYALTY OWNERS ASSOCIATION

WHILE RAINFALL IN THE Lone Star State may be up for the time being, water conservation nevertheless remains a top priority for oil and gas producers operating in the state of Texas. Texas producers genuinely appreciate the value of water as one of our key natural resources – weighing its worth not only from a business perspective but also as an essential component of our ecosystem – which is why, whenever possible, oil and gas companies are constantly improving their water management and conservation practices in the oilfield.

In fact, water recycling and reuse for Texas exploration and production activities is more prevalent now than ever before.

TIPRO is proud of our association's members that are leading progress in this field, as these companies accelerate their adoption of new water technologies to make the most of recycled and reclaimed water collected from the well site and lessen overall freshwater requirements for their oil and gas operations. Apache Corporation, for example, has eliminated freshwater usage at its Wolfcamp shale wells in the Permian Basin, where since 2013 the company has met its water needs by drawing brackish water from the Santa Rosa aquifer and taking advantage of water recycled from its wells. The fact that Apache has found a way to recycle 100 percent of the produced water from its unconventional wells is truly groundbreaking. And Apache is not alone in such efforts – other TIPRO companies also have been deploying advanced technologies and recycling systems that will save millions of gallons of fresh groundwater. Inside this edition of *Upstream Texas*, learn more about how another TIPRO member Pioneer Natural Resources has entered a historic agreement to partner with the cities of Midland and Odessa to use reclaimed wastewater and allow the company to reduce its needs for freshwater in the Midland Basin. Read more beginning on page 8.

It is remarkable to think that oil and gas water recycling is becoming mainstream, and that one day hopefully in the not so distant future, Texas producers would like to discontinue the use of freshwater for drilling and hydraulic fracturing operations.

This initiative voluntarily taken on by TIPRO members to enhance water conservation efforts remains as important as ever before. Not only must Texas strategize to satisfy current water needs, but experts are forecasting water demand to surge in the coming decades as the state's population rapidly grows.

Texas' population is expected to increase more than 70 percent between 2020 and 2070, from 29.5 million to 51 million, with water demand projected to increase by 17 percent over that time period from 18.4 million acre-feet per year in 2020 to 21.6 million acre-feet per year in 2070, reports the Texas Water Development Board (TWDB) in the agency's 2017 State Water Plan. Looking forward the next 50 years, TWDB anticipates that the mining sector [which includes the oil and gas industry] will still only account for less than 3 percent of calculated annual water demand in Texas. Even so, our state's oil and gas producers are committed to their role as good stewards of the environment, and will continue to implement innovative water conservation techniques when possible to minimize freshwater usage and instead turn to alternative water sources for energy development.

And though comprehensive water management has long been an issue for the state of Texas, to this day, our officials have prioritized water planning in order to ensure that Texas maintains adequate and affordable water supplies both now and in the future.

The daily work of the TWDB, amongst other state entities, is significant to the efforts enabling Texas to successfully meet our water needs, as the agency lends guidance to Texas communities for the responsible development, management and conservation of the state's water resources.

Meanwhile, oil and gas regulators at the Texas Railroad Commission helped contribute to the promotion of water conservation by industry when the commission adopted new rules in 2013 removing roadblocks which had historically hindered the widespread acceptance of water recycling and reuse by oil and gas producers.

And under the pink dome at the Texas capitol, this spring, legislators have considered policies that will ensure Texas continues to properly manage our sources of water for the years to come, supporting the needs of future generations of Texans. During the 2017 Texas Legislative Session, our state lawmakers have built on the legislative successes of last session to further support additional water planning and conservation efforts.

On behalf of our state's oil and gas producers, TIPRO will continue to advocate for sound policies that back industry's efforts to conserve and repurpose water. ■



IT IS REMARKABLE TO THINK THAT OIL AND GAS WATER RECYCLING IS BECOMING MAINSTREAM, AND THAT ONE DAY HOPEFULLY IN THE NOT SO DISTANT FUTURE, TEXAS PRODUCERS WOULD LIKE TO DISCONTINUE THE USE OF FRESHWATER FOR DRILLING AND HYDRAULIC FRACTURING OPERATIONS.

technology & innovation

ADVANCEMENTS IN THE INDUSTRY

TECHNOLOGICAL STEP CHANGE ENABLED

U.S. producers to accomplish what previously was thought to be impossible — almost doubling U.S. oil output in less than a decade and adding more than 1 million barrels daily in a single year as part of a historic turnaround that reversed decades of decline and silenced prognostications that America's oil industry was headed for extinction.

Armed with the latest advances above and below ground, the Upstream industry continues to combine technology with an entrepreneurial spirit to drive operating efficiencies that have helped boost per-well output, slow production curve declines, and halve well costs in some plays even in the face of lower commodity prices, says Allen Gilmer, chairman of the Texas Independent Producers and Royalty Owners Association.

Innovations and prescient risk-taking boosted crude oil production from 5 million barrels daily in 2008 to more than 9.4 million in 2015, according to statistics from the U.S. Energy Information Administration. Today, the average U.S. well produces from 50-56 percent more than the average well did just four years ago, points out Gilmer, co-founder and executive chairman of Austin-based Drillinginfo Inc.

"What really made a difference from a recoverable reserve base is the fact that we have been focusing on taking smaller amounts of rock around the wellbore and busting it up much more thoroughly than we did before, and we are getting recoveries that are up to 50 percent better than we were getting busting up a whole lot of rock," Gilmer observes.

Innovation will continue to allow U.S. players to utilize a variety of methods and completion techniques to extract more crude from tight, miserly rock not only in known lucrative plays but also in hybrid plays and stingy formations that hold vast reserves of lower-gravity oil, Gilmer says.

"As a friend of mine told me we are in the second inning of this whole deal," he says. When you talk about process improvement across the board, the oil and gas industry

has done what the other industries have dreamed about.”

And the dream extends to surface innovations that are driving greater efficiencies for E&P companies and service companies in the office and the field. Combining venture capital with young software innovators, petroleum engineers, operators, sales staff, and analysts, Austin-based RigUp goes against the grain of perceptions among younger people that oil and gas is an outdated, stagnant industry lacking foresight and innovation, says RigUp CEO Xuan Yong, who co-founded the company with Mike Witte, RigUp’s chief operating officer.

“There is a perception that it’s not a cool industry to work in, and it’s something your father or grandfather did,” Yong says. “That perception couldn’t be anymore false.”

Starting during the downturn, RigUp has added 150 E&P companies and over 15,000 service companies utilizing a cloud-based platform that makes transactions more efficient by allowing operators to search for vendors quickly, qualify them based on price, HSE, performance and other considerations, track the work step-by-step from inception to completion, and finally provide seamless invoicing, Yong says. The platform also enables clients to manage compliance, he adds.

“If you are a seller or service company, we give you the ability to win new work, manage potential sales opportunities, and give you a centralized ability to see where demand is for services and products,” Yong explains. “We are benefitting both producers and service providers.”

Clients include Cabot Oil & Gas, which experienced cost savings of 15-30 percent on various categories of services after using the platform to manage bidding and compliance processes, he reveals.

During his time as an investment banker and energy investor for hedge funds in New York, the Texas A&M University graduate got the idea to start RigUp while observing that E&P

companies that could oversee drilling of wells three miles deep with one-mile laterals but were often using outdated software in other areas of their business, he recalls.

“The industry had done billions of dollars in subsurface R&D and from a software perspective, it was 2015 and we were still coming across E&P companies that were using Windows 95,” Yong says.

In the summer of 2014, he quit his job, got married, and raised \$3 million in institutional capital to start RigUp and moved from New York to Texas, all in the same month. Shortly thereafter, oil prices began a roller coaster ride downward.

“That initial shock actually turned into a big blessing for the company,” Yong recalls. “That was the tailwind for us to prove our value through a more transparent online marketplace that provides visibility and greater cost structures for companies that were using us.”

RigUp’s platform allows producers to reduce invoicing and work approval, enhancing execution processes while freeing up petroleum engineers to do what they do best – identify and map out strategies to more efficiently exploit prospects and enhance completion and production operations, Yong says.

Meanwhile, Denver-based RockPile Energy Services is utilizing innovative chemical management and proppant transport systems to conduct more efficient, safer operations and is in the early stages of utilizing drones to scope out future work sites and map out logistics, says CEO Curt Dacar.

With operations in nine energy-producing states including Texas, RockPile’s services include hydraulic fracturing, cased-hole wireline, pump-down, cementing and workover rigs.

The company pioneered the first proppant delivery containerized units to the industry, states Dacar, who spent 32 years at Schlumberger before starting RockPile in 2011.

Multiple trips transporting and moving proppant have been the norm, he explains. But the lack of efficiency motivated the company to work with a supplier partner to develop the first proppant delivery containerized units to the industry, a practice now utilized by a growing number of service companies, Dacar says.

RockPile works with strategic chemical partners to customize delivery and storage vessels to minimize the use of chemical totes, he states. Bulk chemical delivery systems dedicate storage to specific chemical types, which eliminates costly loss of chemical tank bottoms, disposal of waste bottoms, and eliminates chemical contamination. It also minimizes the chemical exposure to employees and the environment, Dacar adds.

The process innovation reduces the multiple number of changes required with small tote delivery systems, he says, and provides consistency in the company’s chemical blends while ensuring critical temperature ranges for proper storage and quality control.

“RockPile has never stored, handled or disposed of any chemicals at our facilities. The business model and process addresses all the challenges our peers experience in managing on site and warehouse inventory issues.”

The system eliminates the traditional use of multiple sand storage bins, reducing the carbon and location footprint and allowing for level loading of trucks, Dacar adds. The containers are unloaded with a fork lift and stacked within minutes of arrival, eliminating waiting to unload demurrage. Drivers can be back on the road promptly.

A conveyor system allows for containers to be operated independently by a single employee and can be monitored with load cells to measure accurate sand transfer to the blending unit, he describes. Together, the advances reduce cost, and improve efficiency and safety with the elimination of the traditional pneumatic technique, which has proven to be a silica dust control and noise hazard, Dacar says. ■



INDUSTRY PIONEERING CREATIVE APPROACHES TO OBTAIN WATER

ONCE UPON A TIME, oil and gas companies considered water as one tool among many for producing hydrocarbons, recalls Todd Abbott, president of Pioneer Water Management LLC and vice president of Permian infrastructure for Pioneer Natural Resources.

"In the past, water was a resource, but it was not so critical that companies devoted a great deal of thought to it," he says.


That age passed for many North American producers though with the advent of unconventional shale plays, he reflects.

Perhaps the most obvious clue signaling that transition is the fact that one of the two techniques most commonly associated with establishing that new paradigm—high-volume hydraulic fracturing—actually includes a word that Webster's defines as "operated, moved or effected by means of water."

"Completions technology has made water a much bigger requirement for our industry," Abbott describes. "Wells are getting longer, and the water used for each foot of wellbore is increasing. Water has become a critical resource."

Nevertheless, water is necessary not only for modern oil and gas operations, but also life as we know it. And even though H₂O covers about 71 percent of the earth's surface, the resource does not distribute itself evenly, requiring many inhabited areas to figure out how to obtain enough to satisfy demand.

That need becomes particularly acute in arid areas, such as West Texas, where people have been known to cite the old aphorism that "whisky is for drinking and water is for fighting over."



"We saw an opportunity to use our balance sheet and construction expertise, so we offered to build the city a wastewater treatment plant. In exchange, we told the city we would like to buy the water at the tailgate of the plant."

As such, a number of Texas oil and gas producers continue to work on finding creative ways to slake their operations' thirst. The Texas Independent Producers & Royalty Owners Association cites some examples of such activity among its members:

- As part of a pilot program, Fasken Oil & Gas is using brackish water for hydraulic fracturing operations to limit freshwater depletion.
- Apache Corporation announced in 2016 a partnership with chemists at the University of Texas at Arlington to conduct a baseline water quality study of surface and

groundwater in the newly-discovered Alpine High field in West Texas.

- Pioneer has reached agreements with the West Texas municipalities of Odessa and Midland that will allow the company to obtain significant volumes of water otherwise deemed as waste.

According to Abbott, Pioneer's deals are part of a company philosophy to avoid using potable water for applications that do not require it. Sometimes, that even means turning down perfectly good water because it's exactly that.

"We hear from people who are very willing to sell us their fresh- or agricultural water," he says. "Our stance is to do very little of that. Our goal is to shrink our freshwater as close to zero as possible because it's the right thing to do for the environment."

Public/Private Partnerships

According to Abbott, long-term thinking constitutes a significant part of Pioneer's strategy. He readily cites a number of examples, noting that the company has:

- Vertically integrated into completions by obtaining its own fracturing fleet;
- Acquired its own sand mines to secure a steady supply of proppant; and
- Committed to not drastically ramping its rig count up or down according to commodity prices.

The company's approach to water procurement fits right into that mindset, he indicates, though many specifics are only feasible because of what may constitute Exhibit A of the company's focus on the long view.

That would be the company's Midland Basin leasehold, much of which Pioneer has held since its 1997 formation. For years, Abbott laughs, many in the industry called that property "the world's largest uneconomic oilfield." However, Abbott says, longtime Pioneer Chairman Scott Sheffield proved prophetic about the acreage's potential.

"He was adamant that it was only a matter of time before technology caught up," Abbott says. "Now, thanks to modern completion

technology, you can argue it is the world's largest economic oilfield."

How Large?

"Usually, a company is lucky if its inventory offers five years of growth visibility. Beyond that, people at the company have to take it on faith that new projects are going to come into the pipeline, either by discovery or acquisition," Abbott explains. "Depending on the oil price assumption, one easily could say Pioneer has a *50-year horizon*. That allows us to make really long-term decisions."

Moreover, he observes, that consolidated Midland Basin position, with its closely-packed drilling locations, offers a rare logistical opportunity that has prompted the company's brain trust to make significant capital investments in water infrastructure. That includes a sizable pipeline spine that takes water all the way to drilling locations.

"Our management team is committed to this because it makes sense for the long-term," Abbott says. "This water system requires capital upfront. It is a lot of pipelines and pumps and long-term commitments to the cities of Odessa and Midland, but it gives us a low-cost water supply for a generation of drilling on a large scale. Water is one of the industry's biggest uncertainties for the next couple decades, and de-risking our execution plan requires us to secure a supply."

The Midland and Odessa deals are structured differently. Pioneer approached Odessa city officials about water it was discharging as waste, notes Abbott. "That water is perfectly good for our uses, but not so great as potable water."

The company and the city have inked an 11-year, \$117 million agreement in which the city of Odessa provides Pioneer with millions of gallons of treated municipal wastewater.

"The Odessa deal was fairly straightforward," he says. "It was treating and discharging its water, so we were able to enter an agreement with the city to take ~100,000 barrels a day—at about \$0.27 a barrel."

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With the Midland deal, Abbott reports that city officials knew they needed to commission a new wastewater treatment plant. "The facilities in place were not sufficient for the city's growth, but it is never popular to tell citizens you want to put out a new bond offering to pay for a new sewer plant," he says. "We saw an opportunity to use our balance sheet and construction expertise, so we offered to build the city a wastewater treatment plant. In exchange, we told the city we would like to buy the water at the tailgate of the plant."

"That worked very well," he adds. "I think the Midland deal really highlights how well things can work when there is a mutual benefit between public and private entities."

According to Abbott, when the facility is online, it will provide Pioneer 200,000 barrels per day (bbl/d) of water. Add that to the volumes from the Odessa deal, and those two sources alone amount for up to 240,000 bbl/d for operations that, in 2017, consume almost 400,000 bbl/d. Of course, those needs are a moving target, Abbott points out. Pioneer

added its eighteenth drilling rig to the field in late February 2017, but the Midland plant is not scheduled to begin operation until 2020. Meanwhile, the company's 10-year plan aims to have it producing 1 million barrels of oil equivalent a day by 2026.

"When the Midland plant comes online, the combined 300,000 bbl/d volumes from those deals will make up—and I am projecting according to the assumption that completions will be the same and the rig count will match our prediction—40–50 percent of our water usage. But then, as our rigs continue to ramp up, and the rate from those effluent plants remains constant, it declines to something more like 20 percent of our total usage."

That such volumes still will not slake Pioneer's thirst doesn't seem to faze Abbott. Along with the wastewater deals, he notes that Pioneer and other producers are recycling produced water and making use of brackish water aquifers. "That is not water you're going to put on cotton fields, and it costs too much to treat, so that is a good source that is helpful to the industry and probably not anyone else."

Smart Business, Good Relations

Abbott emphasizes that such smart water management is a matter of good business, but it also helps with the industry's community relations. He cites the Midland deal as an example.

"The Odessa deal certainly was viewed positively, but the Midland deal—where now we are building infrastructure for the municipality, and then providing a source of revenue as we buy wastewater—is tremendously impactful for the people living there. That is something they do not have to pay for. Not only do they not have to pay for the wastewater plant, now the city is getting other revenue that can be infused into the community to help in whatever way the council sees fit. We hear a lot of positive comments about that."

"When I talk to our staff out there, that topic makes them really smile, because people in the community tell them what a great thing their company has done. It makes them very proud to work for the company." ■

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Power Automation Improves Operating Efficiencies, Decreases Costs

The need to reduce wasteful spending practices is more imperative than ever before in the oilfield. Many exploration and production companies have been “sticking to the grid” and drilling new wells within parameters close to permanent utilities. However, sometimes permanent utilities are not an option, such as in remote production areas of the US including the Bakken. In these scenarios, temporary power providers are becoming increasingly challenged to develop innovative technologies off the grid that meet environmental regulations and satisfy stringent economic requirements.

For example, many operators are turning to alternative fuel generators that leverage excess flared/ stranded gas captured from the wellhead. This allows optimized production activities, reduced operating expense, and meets tighter environmental regulations that require a reduction of flared gas. While diesel remains one of the most widely used fuels for powering drilling and production sites, costs associated with using diesel are far from optimal.

Further, by incorporating a power automation system, operators can eliminate generator idle hours and reduce the associated high costs of diesel while greatly reducing emissions, regardless of the fuel source. Customized automated power kits can be retrofitted on both diesel and natural gas generator sets to communicate with an operator’s programmable logic controls, for any remote project with intermittent power needs.

The design of the controls allows generators to automatically start and stop, only running when power is required. This innovative application not only saves fuel and



▲ Shown above is a Power Automation package provided by Aggreko on a single rod pump application

reduces emissions, but also increases uptime due to lower maintenance needs and fewer failures associated with overheating or excessive idle time. The most common applications for power automation include rod

pumps, midstream pumping stations and de-watering facilities. At many pumping stations, producers have been able to reduce their associated fuel costs by 50-80%.

Real-World Results

One of the largest exploration and production companies in the Permian Basin was operating a field of five producing oil wells on electrical submersible pumps (ESPs). As each of the wells began to experience slower production volumes, they deployed rod pumps to replace the ESPs. Since the sites did not have access to utility infrastructure, standard diesel generators were used to power each rod pump.

However, the operator later needed to reduce site emissions and

lower operating costs. Aggreko was consulted and developed a solution including the installation of power automation kits and Tier4i diesel generators to seamlessly transition the sites. The new power packages allowed the generators to only run when the rod pumps were operating, and to automatically shut off when the rod pumps were inactive, effectively eliminating idle hours.

The power automation solution saved the operator \$130,000 annually, reduced emissions by 50% and delivered 100% uptime.

Previously published in the fall 2016 issue of the Bakken Oil Report magazine.



aggreko

“Power Automation saved us
52% on fuel costs.”
– Permian Basin Operator

Many oilfield operations are intermittent by nature, and do not demand power 24/7. Yet, the generators on these sites have historically run non-stop, regardless of whether the application needs power at the time.

Thanks to innovations in Power Automation technology and in-house engineering expertise at Aggreko, idle hours can be completely eliminated. What this means for operators is up to 60% savings in fuel costs—which translates to **saving hundreds of thousands or even millions of dollars annually**, depending on the number of automated sites.

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RAILROAD COMMISSION INITIATIVE AIMS TO OFFER REGULATORY RELIEF IN THE OIL PATCH

AS 2016 DAWNED, it seemed increasingly likely to Texas Railroad Commissioner Christi Craddick that the oil and gas industry's downturn wasn't quite over. Already, that slump had wrung out the high spirits that characterized the industry in recent times. Worse yet one of the few strong portions of the U.S. economy since the Great Recession were bleeding jobs.

The time had come, she reasoned, to act.

Fortunately, Craddick, who before 2016 ended would become the commission's chairman, had been doing her homework. Since she'd begun campaigning for the Railroad Commission in 2012, Craddick had made a point of using her public speaking engagements to ask audiences for feedback. Or as she puts it, she wanted them to

convey the "good, bad and ugly" about the regulatory agency.

The responses were instructive, she says.

"People, particularly small operators, would say there are a lot of forms, and they would ask what the commission does with all of them," Craddick describes. "And as we got into this latest downturn, the other major topic was keeping marginal and stripper wells online."

The overriding theme, Craddick indicates, was to make sure the commission's requirements passed a basic cost/benefit analysis.

Like the adage about converting life's lemons into lemonade, Craddick says she realized that all her informal research could fold into a larger undertaking at the Railroad Commission, as

permitting activity dropped 70 percent in two years and some staff members suddenly found demands on the agency's permitting treadmill slowing from a sprint to a crawl. And so the commission began to make use of that opportunity. While enforcement and inspection activities maintained the normal pace, she reports, other staff members had a rare opportunity to take inventory, all with the thematic emphasis of advancing regulatory common sense.

"The chance to come up and take a breath as an agency allowed us to look at our rules," she says. "It was a good time to do that."

Craddick called on commission staff to do so with the goal of helping small operators stay in business and keeping Texans employed at oil companies. But it wasn't only



Railroad Commission staff from whom she wanted to hear. The commission also reached out to the industry and other stakeholders in search of changes that would make a real difference.

"We looked at areas that would offer the biggest cost savings," Craddick says. "We saw that, first and foremost, getting rid of unnecessary paperwork requirements would cost less money. We also looked at things we could do in our internal processes. Sometimes, those are easy to fix, sometimes not."

At one point, Railroad Commission sources say, the agency ascertained about 40 possible efforts it could undertake, but that list needed refinement. The commission took note of which items would require statutory changes, versus those that required nothing

more than internal action. The Railroad Commission also solicited informal comment on the possibilities so that the industry and stakeholders could offer input.

"That is how we began the whittling-down process," Craddick says. "It is impossible to do it all in one fell swoop. It is about prioritizing some things in an effort to make the biggest difference in a downturn. That was a priority."

The Specifics

Last August, the Railroad Commission unveiled Commissioner Craddick's Texas Oilfield Relief Initiative, which was made up of nine items. Specifically, the commission announced this regulatory initiative would:

- Identify agency reports and filings that can be reduced or eliminated, saving

operating costs without impacting public or environmental safety.

- Amend Statewide Rule (SWR) 28 to modify gas well deliverability reporting requirements.
- Reduce the need for G-10 gas well status report filings, except for surface commingled production.
- Allow a calculated well shut-in pressure to be provided when filing Form G-10 for gas wells to reduce regulatory administrative burdens.
- Amend production requirements for marginal and stripper wells to reduce regulatory administrative burdens.
 - Revise the "active oil well" definition from 10 barrels of oil a month (bbl/month) for three consecutive months to five bbl/month for three consecutive months or any reported production in

each month for a consecutive 12 month period (SWR 15).

- Revise the “active gas well” definition from 100 thousand cubic feet (Mcf) a month to 50 Mcf/month or any reported production in each month for a consecutive 12 month period (SWR 15).
- Implement a revised internal inspection priority system so commission inspectors can prioritize drilling rig inspections and hydraulic fracture treatments in sensitive areas such as cities or wetlands without affecting other inspections.
- Review existing washout factors to determine whether different washout factors should be used in certain areas of the state for calculation of cement tops. In doing so, this would expedite the process of verifying compliance with agency rules for both operators and the commission without compromising well integrity.
- Direct the Groundwater Advisory Unit to identify counties or portions of counties in which the usable quality water protection depth is constant. Those areas will be eligible for area-wide recommendations for meeting surface casing requirements, streamlining industry regulatory requirements.
- Issue guidance for implementation of the Texas Environmental, Health & Safety Audit Privilege Act, permitting operators of new property to identify and remedy violations which occurred prior to their ownership. This ensures compliance without punishing an operator not responsible for the violation.
- Conduct an extensive review of all Railroad Commission forms required for application and reporting purposes to determine whether data collected are used currently or no longer necessary. Staff also was instructed to consider eliminating forms no longer useful to the commission’s regulatory functions to reduce regulatory administrative burden on staff and industry.
- Simplify the complete duplication of a drilling permit application with a sworn statement of no changes to the original application. The operator then would pay the fee for reissuance of the permit, speeding the review process and reducing regulatory administrative burden for both the agency and industry.

As an association serving a majority of the state’s oil and gas producers, including many

“We saw that, first and foremost, getting rid of unnecessary paperwork requirements would cost less money. We also looked at things we could do in our internal processes. Sometimes, those are easy to fix, sometimes not.”

small family-operated businesses, TIPRO says that it was especially appreciative of Chairman Craddick’s leadership in spearheading an initiative that offers necessary and timely improvements to Railroad Commission procedures and regulatory practices. “These reforms help to provide much needed relief to operators across the state as we continue to confront depressed commodity prices,” said Ed Longanecker, president of TIPRO.

Despite the need to act quickly to help both the agency and the industry weather the tough times, Craddick indicates the need for speed did not override the need to get it right. “In a downturn, we want to save money for both the agency and the industry, as quickly as possible, but even if knee-jerk reactions sound good, they are not always the best way to regulate,” she says. “We wanted to get good feedback from all stakeholders and see if those ideas also worked for us as an agency. There were challenges with our information technology systems. We also knew it was important to talk with some of the experts in our agency that understood the history of why the commission does or does not do certain things. It was important to put sufficient thought into this initiative before going forward.”

And even after the specifics were announced, she notes, not all of them could be fully implemented immediately. A few did not take effect until around the turn of the year.

Even so, Craddick emphasizes that the Texas Oilfield Relief Initiative is not inherently tied to tough times. As the glut in world crude inventories shrinks and commodity prices recover, the brighter industry outlook is not going to squelch the impetus for smart oversight, she promises.

“Commonsense regulation is always important, no matter the oil price,” she says. “If our agency costs the industry unnecessary dollars that can be spent on things other than complying with excessive regulations, we are not doing our jobs. We are always looking for common-sense approaches. We are always looking for good rules and how to adjust those rules. At the end of the day, oil and gas industry margins always are going to be slim. My goal for the Railroad Commission is not to be an impediment to someone having a job.”

Only Phase I

It’s worth noting that some elements of the initiative seem to be especially well-suited to an upturn. For instance, since December 2016, the Railroad Commission has allowed operators to reapply for new drilling permits for wells that were not spudded before an original drilling permit’s expiration. As long as the conditions on the lease/unit have not changed, the commission says an operator can use documents provided with the original application, which should help as drilling activity picks up.

Craddick also points out that the first nine provisions are merely the initiative’s first phase. She indicates that further regulatory improvements under the Texas Oilfield Relief Initiative will be considered moving forward in the future.

Moreover, she says, input from the Texas Independent Producers & Royalty Owners Association has helped provide significant food for thought as the initiative evolves. “TIPRO has been particularly helpful with a couple rules and processes dealing with washout factors, groundwater advisory units and figuring out our areawide requirements for surface casing,” she says. “We appreciate TIPRO’s feedback. Small operators have been the long-term lifeblood of this industry and they are, across the board, a very reliable source of good information.” ■



CHRIS PADDIE

Texas State Representative

IT MAY SEEM COUNTERINTUITIVE, but good salespeople often succeed not by saying all the right things, but instead by listening, suggests Texas Representative Chris Paddie.

Paddie, who represents Texas State House District 9, has made a career in sales, where over the years he says he has come to appreciate the value of listening to people to identify and understand their motivations. From his experience in sales, Paddie relates, one cannot underestimate the importance of communicating effectively and engaging directly with people—skills of which he uses now more than ever perhaps as a lawmaker serving in the state legislature.

Paddie first began his sales career in Houston, where he moved following his graduation from Texas A&M University. In Houston, he worked selling safety equipment and industrial products. Paddie later relocated back home to East Texas, settling with his wife and two sons in the city of Marshall, Texas, where he became the general manager of KMHT radio station.

Once he put down roots in Marshall, Paddie says he found himself interested in serving a more elevated role and becoming involved with the city government. In 2008, Paddie was elected to the Marshall City Commission, and went on to become Marshall's mayor.

In 2012, Paddie won his election to represent District 9, which includes his home city of Marshall, in the Texas House of Representatives. Five years later, Paddie has been re-elected as District 9's representative for his third consecutive legislative session.

During his time in the House of Representatives, Paddie has nabbed a seat on several prominent legislative committees, including the House Energy Resources Committee. This committee—particularly important to members of TIPRO—holds jurisdiction over the production, regulation, transportation, and development of oil, gas, and other energy resources; the leasing and regulation of mineral rights under public lands; mining; the conservation of the energy resources of Texas; developing and using alternative energy sources; and increasing energy efficiency throughout the state. In 2015, Paddie was pleased to be appointed by Speaker of the House Joe Straus as the vice chairman of the Energy Resources Committee during Texas' 84th Legislative Session.

Although, long before his role on the House Energy Resources Committee, Paddie indicates he held a strong appreciation of oil and gas. After all, Paddie notes, he grew up in East Texas, where oil and gas has been a major component of the region's history and backdrop. He proudly points out one of his district's local broadcasting stations in Carthage, Texas, that goes by the call letters "KGAS."

"I've always appreciated oil and gas as part of our lives and a huge driver of our economy," he says, "yet my time on the Energy Resources Committee did help me better understand the industry's place in other parts of the state, as well as the nuts and bolts of energy production."

PADDIE SAYS HE HAS ENJOYED WORKING WITH TIPRO SINCE HE FIRST ARRIVED IN THE LEGISLATURE. "WE LEAN HEAVILY ON TIPRO'S EXPERTISE TO MAKE SURE WE FULLY UNDERSTAND THE RAMIFICATIONS OF OUR POLICY DECISIONS. THE STAFF IS GREAT, THE MEMBERS ARE GREAT AND I HAVE CONSTITUENTS WHO ARE VERY ENGAGED WITH TIPRO. THOSE FOLKS HAVE PUT A LOT OF BLOOD, SWEAT AND TEARS INTO BEING SUCCESSFUL."

Now, a couple of years later, Speaker Straus has appointed Representative Paddie to serve as a member of the House Calendars Committee in addition to legislative committees that focus on licensing and administrative procedures, state affairs, and state and federal power and responsibility.

As he considers the work of the legislature this year, the state representative expresses hope that once the session has ended, Texans will feel like their lawmakers accomplished the necessary tasks, including passing a budget that allocates tax money wisely.

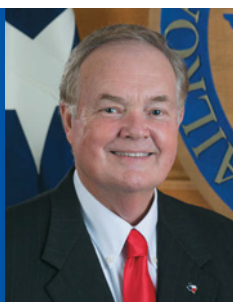
"I hope people look back and say we did a good job with what we had to work with. Although we never get everything we want, I want Texans to feel mostly satisfied," he stresses.

While thinking about the legislature's 2017 review of the Texas Railroad Commission—which has undergone its third evaluation by the state's Sunset Advisory Commission in just seven years—Paddie calls attention to the importance of the state's oil and gas regulatory agency.

The Railroad Commission's prominence prompts Paddie to raise concern that the legislature properly funds the agency, now and in the future. Although it may have been a worthwhile experiment at one time to make the agency self-funded, he suggests, that strategy has not worked as well amid an industry slump. "Whether times are good or bad, the Railroad Commission must have the resources it needs," he emphasizes.

Of course, such a statement will draw no objection from the Texas Independent Producers & Royalty Owners Association. Paddie says he has enjoyed working with TIPRO since he first arrived in the legislature.

"We lean heavily on TIPRO's expertise to make sure we fully understand the ramifications of our policy decisions. The staff is great, the members are great and I have constituents who are very engaged with TIPRO. Those folks have put a lot of blood, sweat and tears into being successful." ■



WAYNE CHRISTIAN

Texas Railroad Commissioner

AFTER SEVEN TERMS REPRESENTING Center, Texas, and the surrounding area in the Texas House of Representatives, former state lawmaker Wayne Christian saw an opportunity to guide a regulatory agency that his experience in the legislature had taught him was critically important to the Lone Star State.

In 2016, Christian made the decision to throw his hat into the ring for the open seat at the Railroad Commission of Texas, winning the election by strong margin to become Texas' new energy regulator.

"I felt it was my responsibility to leverage the policy expertise and contacts I have accumulated over the years toward a greater purpose," he says. "Texas has a tremendous opportunity to make our nation energy secure. I wanted to play a role in ensuring our state maintains a fair and predictable regulatory environment, allowing us to take full advantage of the natural resources God has provided us."

Christian says he is particularly drawn to make that happen thanks to his talent as a popularizer. Some people have a knack for turning jargon into plain talk, and Christian feels he is one such translator.

"One of my strengths is the ability to condense complex information and present it to the general public in a way people can understand," he explains. "I hope to use this position at the Railroad Commission to communicate the important role hydrocarbons play in our society, and combat many of the falsehoods that have been perpetuated by radical environmentalist groups. Texans need to know that the producers in our state are overwhelmingly responsible and that the Railroad Commission is there to protect them from bad actors."

As he articulates the importance of the Railroad Commission, Christian first cites the importance of oil and gas. The industry has a long history in Texas, and there is no reason to believe that will change, he reasons.

"In 2016, there were 15 oil fields and eight gas fields discovered in Texas, including the largest oil and gas deposit in U.S. history, containing 20 billion barrels of oil and 16 trillion cubic feet of natural gas worth an estimated \$900 billion," he says. "Texas has the opportunity to use these resources to make the United States energy secure for the first time in 50 years. For far too long, OPEC has caused market instability for the oil and natural gas industry. As the preeminent oil and natural gas regulatory

body in the state, the Railroad Commission is ready to do its part to help Texas and the United States secure its energy future."

That bright energy future appears to be emerging from an extended swoon that many attribute to the one-two punches of oversupply and overregulation. Christian mentions indicators that the industry may not have to endure those blows for much longer.

"The Texas energy sector is on the cusp of a major recovery," he foretells. "In fact, the Federal Reserve Bank of Dallas concluded that the oil and gas outlook improved dramatically at the end of 2016, with activity within the oil and gas industry continuing to rise."

With Texas' own Rick Perry selected by President Donald Trump to lead the U.S. Department of Energy, and Oklahoma's Attorney General Scott Pruitt taking the helm at the U.S. Environmental Protection Agency, Christian is optimistic about the new federal regulators that are descending on Washington, D.C. "For the first time in almost a decade, we have a pro-business presidential administration, hopefully allowing Texas to be more autonomous in its decision-making and bringing more power back to our state and the Railroad Commission."

Since arriving at the Railroad Commission at the start of 2017, Christian notes how impressed he has been by the staff's diligence and expertise. As the owner of a small financial planning firm, Christian says he knows an outfit's success depends on its staff. Fortunately, he finds the agency's personnel to be tremendous.

"The caliber of employees here at the commission is top-notch," he says. "Our commission is successful not from just the efforts of three elected commissioners in Austin, but because of the hundreds of quality professionals in our headquarters and 12 district offices across the state."

However, he does warn that quality is threatened by a new sort of attrition. "Unfortunately, in recent years, we have begun to lose qualified employees—not just to the free market (that is inevitable)—but to other agencies due to salary parity," Christian says. "We currently have around 140 vacancies, this means roughly 20 percent of our positions are unfilled. It is imperative that the commission fills these positions and is funded properly enough to retain experienced employees with institutional knowledge. That has been, and will continue to be a major project for our office, as we discuss our budgetary challenges with members of the legislature." ■



FRANK D. BRACKEN III

Chief Executive Officer of Lonestar Resources, Inc.

AS A NEW HIRE at his first job out of college, Frank D. Bracken, III was typecast. Arriving at Fidelity Investments' portfolio management group in Boston, he was informed that his home state made him a natural fit for specializing in oil and gas investments.

"It was nothing short of stereotyping," he laughs. "They said, 'you're from Texas, you have to do oil and gas.'"

Had growing up in Dallas supplied him with any personal connections in the energy industry?

"Absolutely none," remarks Bracken. "My dad was in the apparel business. No one in my family had any oil and gas minerals, nor was in the business. I could not have been further detached from it."

Even so, that first job was his gateway into the world of oil and gas. The fresh-faced Bracken held a position that provided access to top oil and gas executives, he recalls, and he found himself falling in love with the industry.

That passion for oil and gas continues to this day. Since 2012, Bracken has been chief executive officer of Lonestar Resources, a small, Eagle Ford Shale-focused operator. His mandate for 2017, he says, is to double the company's size.

Relying on his experience in finance has helped Lonestar remember that the bottom line is the bottom line, Bracken suggests.

"On occasion, the industry gets lost in non-financial accomplishments," he says. "My background has led me to be singularly focused on hiring technical people with an appreciation and understanding of returns. At the end of the day, I don't care how much oil and gas we make unless we make good money doing it."

According to Bracken, the company strives to attract top-flight technical talent. "Our vice president of geology was integrally involved in Petrohawk's discovery of the Hawkville One field, so she has an amazingly deep background in the Eagle Ford," he describes. "Our drilling and completion managers have tremendous experience that belie a company our size. We have invested a lot in developing excellence in our technical talent. The people in our operations team have incredible, worldwide experience. Not necessarily being a specialist—the Eagle Ford is only 9-10 years old—but having a wealth of professional life experience is really important to what we do."

The key is enabling the human assets to unlock those in the portfolio, he considers.

"We have really good assets and have drilled really good wells," Bracken says. "We have put a lot of time and money into those things, but I really have had to learn about developing human capital. I am exceedingly proud of the people in our organization. I see

"TIPRO IS A WAY FOR US TO STAY PLUGGED INTO WHAT IS GOING ON. WE ARE NOT BIG LOBBYERS. BEING MEMBERS OF TIPRO IS A WAY FOR US TO LEARN ABOUT THINGS THAT MIGHT ADVERSELY AFFECT OUR INDUSTRY OR THINGS WE NEED TO WATCH FOR. HAVING THAT CHANNEL OF COMMUNICATION IS VALUABLE."

companies in our play with leaseholds that have better quality rock than ours, but it does not mean they are drilling better wells. Our human capital creates a lot of value. To a large extent, it is the difference-maker, and it is another one of my jobs to make sure that all the parts are put together properly and we are getting the most out of that component of our business, which is hugely value-added."

Bracken reports that Lonestar has navigated the industry's slump with a combination of fortunate timing and financial savvy. In 2014, the company financed much of its debt with an unsecured note that provided a low cost, very stable platform of semi-permanent capital. The company also had hedged an inordinate portion of its crude oil production from 2014-16 for what proved to be favorable prices.

Moreover, Bracken says, the company took advantage of an extraordinarily weak bond market to repurchase one-third of Lonestar's outstanding notes at roughly fifty cents on the dollar, which created meaningful equity value, and the company's NASDAQ listing helped it raise \$79.4 million in new equity.

"I think the quality of what we have done, both financially and operationally, allowed us to attract new institutional investors late last year and has positioned us well for \$50 oil," he notes.

And when it comes to adding value, Bracken readily acknowledges the Texas Independent Producers & Royalty Owners Association does exactly that for Lonestar. "TIPRO is a way for us to stay plugged into what is going on," he says. "We are not big lobbyists. Being members of TIPRO is a way for us to learn about things that might adversely affect our industry or things we need to watch for. Having that channel of communication is valuable." ■



TIPRO WELCOMES NEW MEMBERS

Alford, Jamie

Allen, Mike
Providence Energy Corp.

Ashley, Mark
Santo Petroleum, LLC

Barnes, Ronald
Oil & Gas Asset Clearinghouse

Bateman, Jill
Branded B

Bell, Henry
H & PB Burlco Family Properties, Ltd.

Bell, Pamela
H & PB Burlco Family Properties, Ltd.

Bell McFarland, Regina
H & PB Burlco Family Properties, Ltd.

Blackburn, Jordan
SM Energy Co.

Bosilevac, Chip
Cowboys Resources Corp.

Bujano, Gil
BP America

Cadman, Bill
Whiting Petroleum Corp.

Cantu, Josiah
Welder Exploration & Production, Inc.

Castle, Andy
Cowboys Resources Corp.

Castle, Suzanne
Cowboys Resources Corp.

Castle, Terry
Cowboys Resources Corp.

Christian, Wayne
Breck Operating Corp.

Cole, Dan
Denbury Resources, Inc.

Courson, Harold
Courson Gas Consultants

Davis, John
Bibby, McWilliams & Kearney, PLLC

Fitzsimons, Fay
Noble Energy/FTI Consulting

Ganer, Jason
Sierra Pine Resources International

Gentry, Charlie
Welder Exploration & Production, Inc.

Gentry, Kevin
MadMackenzie Solutions

Gordon, Kimberly
INTERA Petroleum Consultants

Hammond, Chad

Harmon, Mark
Chesapeake Energy Corp.

Heflin, Zach
Courson Gas Consultants

Heneman, Helmuth
NRG Systems, Inc.

Herman, Michael
Newark E&P Operating, LLC

Houser, Mark
University Lands

Lake, Larry
INTERA Petroleum Consultants

Lanigan, Matt
Newpark Mats & Integrated Services LLC

Lemmerman, Erin
Chesapeake Energy Corp.

Marbach, Kenneth
EOG Resources, Inc.

May, Mike
US Geophysical LLC

McCullen, Deena
Noble Energy

McIntosh, Christopher
Square Mile Energy, LLC

Mendoza, Rodney
Forge Energy

Mincher, Rick
Cowboys Resources Corp.

Mischloney, Michael
Welder Exploration & Production, Inc.

Nunez, Emilio
INTERA Petroleum Consultants

Oliver, Wade
INTERA Petroleum Consultants

Pender, Sam
Courson Gas Consultants

Petty, Chris
H&H Petroleum, LLC

Piper, Stuart
DistributionNOW (DNOW)

Pittman, Clyde
Epic Emergent Energy, Inc.

Poole, Tracy
McAfee & Taft

Race, John
Associated Bank

Rayes, Patrick
Rayes, Inc.

Reardon, James
ATR Energy LLC

Rhodes, Wiley
Newpoint, LLC

Riley, Mike
Courson Gas Consultants

Roberts, Andy
Welder Exploration & Production, Inc.

Rogers, Jim
Cowboys Resources Corp.

Saunders, Don

Sechrist, Scott
Acoustic Geosciences Consulting

Sharrock, Matt
Santo Petroleum, LLC

Skinner, Robert
Broad Oak Energy II, LLC

Standley, Jim
Texas Alliance of Energy Producers

Stanislav, Terry
Locus Bio Energy

Stensrud, Bruce
WCS Oil & Gas Corp.

Stone, Mike
Big "6" Drilling Co.

Stratton, Jay
Permian Resources, LLC

Taylor, Tom
Taylor & Co.

Torres, Oscar
Tower Rock Oil & Gas

Vaile, Ryan
Phoenician Resources

Vollands, Phil
Newpark Drilling Fluids, LLC

Waldrop, Gary
Santo Petroleum, LLC

Waller, Andy
Diamondback Energy, Inc.

Wells, Candice
LINN Energy, LLC

Wilson, Larry
Square Mile Energy, LLC

Winn, Lisa
XTO Energy

NEW STUDENT MEMBERS

Achour, Sofiane
University of Texas at Austin

Blissard, John
Texas A&M University

Cahill, Nicolas
Texas A&M University

Clafin, Luke
Texas A&M University

Clinton, Eric
Texas Tech University

Delano, Collin
Texas Tech University

Erincik, Mehmet
University of Texas at Austin

Gonzalez, Israel
University of Texas at Austin

Groh, Alex
Texas A&M University

Helsabeck, David
Texas Tech University

Hill, Adam
Texas Tech University

Hoin, Hamzah
University of Texas at Austin

Huang, Leo
University of Texas at Austin

Kopinsky, Matias
University of Texas at Austin

Lam, Alan
University of Texas at Austin

Leslie, Brad
University of Texas at Austin

Li, Yunan
Texas A&M University

Matous, Zachary
Texas A&M University

McGonagill, Teresa
Texas Tech University

Mistry, Yash
Texas A&M University

Nikolaou, John
Claremont McKenna College

Parker, George
Texas A&M University

Rafik, Musa
University of Texas at Austin

Rich, Amber
Texas Tech University

Rojas, Jacob
Texas A&M University

Shirley, Austin
University of Texas at Austin

Shuler, Peter
Texas Tech University

Toy, Jacob
University of Texas at Austin

Watson, Kathryn
University of Tulsa



Calendar of Events

April 12, 2017

IPAA/TIPRO "Leaders in Industry" Luncheon
Houston Petroleum Club
Houston, Texas
For more information, call (202) 857-4733.

May 10, 2017

IPAA/TIPRO "Leaders in Industry" Luncheon
Houston Petroleum Club
Houston, Texas
For more information, call (202) 857-4733.

June 14, 2017

IPAA/TIPRO "Leaders in Industry" Luncheon
Houston Petroleum Club
Houston, Texas
For more information, call (202) 857-4733.

July 12, 2017

IPAA/TIPRO "Leaders in Industry" Luncheon
Houston Petroleum Club
Houston, Texas
For more information, call (202) 857-4733.

August 9, 2017

IPAA/TIPRO "Leaders in Industry" Luncheon
Houston Petroleum Club
Houston, Texas
For more information, call (202) 857-4733.

August 9-11, 2017

TIPRO's Summer Conference
Hyatt Hill Country Resort
San Antonio, Texas
For more information, call (512) 477-4452.

August 16-17, 2017

NAPE Summer Expo
George R. Brown Convention Center
Houston, Texas
For more information, call (817) 847-7700.

September 13, 2017

IPAA/TIPRO "Leaders in Industry" Luncheon
Houston Petroleum Club
Houston, Texas
For more information, call (202) 857-4733.

October 11, 2017

IPAA/TIPRO "Leaders in Industry" Luncheon
Houston Petroleum Club
Houston, Texas
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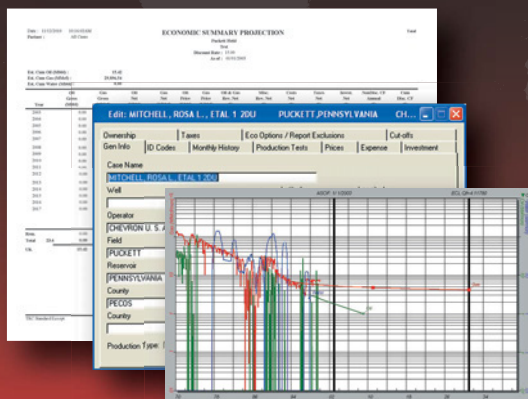
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