INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA

Environmental Issues in the Oil Patch

Lee O. Fuller

Executive Vice President

The environmental regulatory framework for oil and natural gas production has changed dramatically over the past decade at both federal and state levels. Much of this change reflects the growth in American oil and natural gas production resulting from the broad application of hydraulic fracturing and horizontal drilling to open access to shale gas and shale oil reserves. In the late 1990's and early 2000's, while there were a core of environmentalists opposing hydraulic fracturing, there was a counterweight among a number of environmental advocates that wanted to oppose coal combustion. Those groups supported a transition to natural gas as a step toward an acceptable renewal fuels climate management policy – viewing natural gas as a bridge to the ultimate objective.

By the mid-2000's, hydraulically fractured shale gas could be recognized not as a bridge to the future but as a superhighway of sustainable natural gas reserves for both American consumption and exports throughout the world. This reality coalesced environmental advocates and produced a vendetta toward natural gas – and later toward crude oil – targeting suppression of future development and shutdown of existing production. The scope of what is now commonly called the Keep It in the Ground movement is broad and expanding.

With roots in efforts to attack hydraulic fracturing as an unsafe technology – allegations that have been extensively shown to be egregiously baseless – the Keep It in the Ground agenda expanded. It moved to characterize all oil and natural gas production activities – activities that are no different for conventional production than for fracturing production – as fracturing, to imply that "fractured" natural gas is somehow different, to target not only the production of oil and natural gas but its transportation and use, and – more pertinently for the discussion – to expand its opposition to other environmental management issues. This discussion will primarily address air emissions regulatory issues including methane management.

Framing the Issues

To place the current environmental issues in context, it is necessary to review the past. Air emissions from oil and natural gas operations have not historically been a significant regulatory target. Most of the attention prior to the actions by the Obama Administration were directed toward some specific issues – management of poisonous hydrogen sulfide in sour oil or gas production areas, benzene emissions from glycol dehydrators and a few others. Some production operations in urban ozone nonattainment areas are regulated for Volatile Organic Compounds (VOC). But, because historic oil and natural gas production was largely comprised of rural operations from widely dispersed individual wells, the industry emissions profile did not generate aggressive regulatory initiatives at either the state or federal level.

Unconventional shale oil and natural gas production operations changes the perception of the emissions profile. Unconventional production concentrates the emissions potential. First, the use of horizontal drilling means that a single well can be producing from a geographic distance

of a mile or more from the well bore. Second, numerous wells are developed from one site such that any emissions are more concentrated. The issue of emissions perception is important in the context of the regulatory deliberations that are in play because limited analysis exists on the extent of these emissions. Yet, significant regulatory determinations have been made.

These technology changes were taking place at the same time that an array of political and regulatory initiatives was developing.

Initial Actions and Reactions by the Obama Administration

The first of these related to litigation involving the Clean Air Act (CAA) New Source Performance Standards (NSPS) for oil and natural gas production facilities. In January 2009, environmental groups filed an action to compel EPA to act under its CAA mandatory duty to review the oil and natural gas production facilities NSPS. The use of litigation to capture and drive regulatory agendas has been a growing challenge for all federal regulatory agencies. Created in a time when the development of regulations was far less litigious, in the current adversarial climate, agencies cannot realistically complete their regulatory tasks in the time frame envisioned by Congresses of the 1970s. Consequently, they are far more vulnerable to challenges based on failures to meet mandatory deadlines – challenges that are virtually impossible to rebut. Environmental groups use this weak position to attempt to grab control of an agency's regulatory agenda and shift it to their priorities.

In this instance, the CAA requires EPA to consider NSPS revisions for each category of standards every 8 years. EPA has missed this deadline for oil and natural gas production facilities. Unable to defend its position, EPA finalized a consent decree in February 2010 to propose regulations or a decision not to propose regulations in 2011 and finalize action in 2012.

Second, as EPA began its process, the Obama Administration began to embrace the environmentalist opposition to American oil and natural gas production. By early 2012, the Obama Administration had initiated actions by ten different agencies to federalize regulation of American oil and natural gas production. Then, as the election approached, in April 2012, the Obama Administration announced the creation of its Interagency Working Group to Support Safe and Responsible Development of Unconventional Domestic Natural Gas Resources. This Working Group allowed the Obama Administration to manage the diverse agency efforts that had been initiated reflecting the growing importance of American natural gas development in the economy. By the end of 2012, the intensity of federalizing oil and natural gas production regulation had diminished with three regulatory initiatives still active – EPA guidance to restrict the use of diesel fuel in hydraulic fracturing under the Safe Drinking Water Act, Bureau of Land Management (BLM) drilling regulations affecting hydraulically fractured wells, and the EPA CAA NSPS regulations under the consent decree.

Third, while the debate in the early years of the Obama Administration on climate change and greenhouse gases largely focused on carbon dioxide and on large utility coal-fired electric generators, there were elements that targeted oil and natural gas production. One was the ongoing Gas STAR voluntary reduction program that engaged producers to implement technologies to manage primarily methane emissions from their operations. Another was regulatory requirements to report emissions to the EPA Green House Gas Inventory (GHGI). This rulemaking (Subpart W for oil and natural gas systems) demonstrated EPA's limited understanding of the nature of oil and natural gas production operations and the limited analysis that had been applied to identify air emissions associated with the industry.

EPA finalized its oil and natural gas production facilities NSPS in 2012. They addressed oil and natural gas production, natural gas processing, production gathering and boosting stations, and natural gas compressor station. The oil and natural gas production regulations target the reduction of VOC from fractured natural gas wells, from oil wells, and from storage vessels. They specifically included reduced emissions completion (REC or Green Completion) limitations for fractured natural gas wells, pneumatic controllers from oil and natural gas wells, and oil and natural gas liquids storage vessels. In general, for the oil and natural gas production NSPS regulation – Subpart OOOO – EPA utilized the technologies that had been a part of the Gas STAR program to fulfill the Best System of Emissions Reduction (BSER) requirements of NSPS. However, the ever-present challenge of developing accurate definitions for the purposes of regulation led to conflicts related to the appropriateness of the BSER requirements to the full scope of facilities captured by the regulations. For example, the REC technology is utilized by hydraulically fractured wells where water can be separated from gas but the definitions captured nitrogen fractured wells that cannot use that technology. Not surprisingly, the regulations were challenged.

Subpart OOOO and Subpart W demonstrated EPA's limited understanding of the nature of oil and natural gas production facility emissions patterns. For NSPS development, failure to have a sound scope of knowledge on emissions and technologies creates a significant regulatory challenge. NSPS requires EPA to use "the best system of emission reduction which (taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated". It creates four components that must be assessed and balanced – cost, nonair quality health and environmental impact, energy requirements and adequate demonstration. However, EPA never developed robust information on the emissions from oil and natural gas production facilities, never developed robust information on technologies to manage emissions, and never developed robust information on the four factors needed to determine BSER. Instead, EPA relied on is Gas STAR experience and whatever literature was available to it.

In 2013, an analysis developed by the University of Texas generated a new understanding of the emissions dynamics of oil and natural gas production facilities. Most methane emissions studies involve acquiring data from methane plumes using offsite monitoring. Inherently, this approach cannot distinguish between fugitive emissions and permitted emissions from vents and other operations. The University of Texas study included onsite emissions monitoring. One of its most significant findings was that the emissions profile from production operations included a substantial "fat tail" component. That is, while most of the equipment was characterized by low emissions, a small segment would have higher releases due to some type of failure. It raised the challenge of developing fugitive emissions management programs that target correcting this small segment cost effectively. Several state regulatory programs began to develop fugitive emissions programs.

By the beginning of 2014, the political, technical, regulatory framework was characterized by the following components. The Obama Administration was pursuing a more limited regulatory agenda in the context of managing emissions from the expanding development of natural gas. Technically, the emerging understanding of oil and natural gas production emissions was identifying that completion emissions were well managed by REC technology for hydraulically fractured wells, that operating emissions were generally low but with some "fat tails" that needed to be managed, and that the extent of this understanding was based on a limited amount of

information and more was needed. Regulatorily, the primary federal regulations were embodied in the Subpart OOOO NSPS. And, states were beginning to assess methods to address operating emissions.

All of this was about to change.

The Obama Administration Prioritizes Climate Action

In June 2013, the Obama Administration announced its intent to develop a Climate Action Plan to address greenhouse gas (GHG) emissions. Among the target emissions was methane. Methane emissions account for roughly 9 percent of America's GHG emissions. Roughly, one-third of methane emissions come from oil and natural gas systems with roughly one-third of those from oil and natural gas production operations. Consequently, the share of America's GHG emissions from methane releases from oil and natural gas production is between one and two percent. Technically, methane and VOC are emitted simultaneously from oil and natural gas production operations and, therefore, controlling VOC – as Subpart OOOO had done – also controls methane. Significantly, oil and natural gas production emissions were declining.

The issue of managing methane emissions from oil and natural gas production facilities would become a pivotal one for the remainder of the Obama Administration. It was primarily a political issue played out in the regulatory arena. Methane has a higher GHG potential than carbon dioxide although it has a shorter lifetime. Environmentalists began a strategy to attack methane emissions using the climate agenda to address their renewable energy agenda that had been undermined by the shale gas revolution. Part of this agenda was challenging emissions estimates of methane; part of it was pressing the Obama Administration for regulation.

Taking the regulatory agenda first, as the Obama Administration began its second term, its interest in the economic benefits of American natural gas production diminished as the economy strengthened and natural gas supply was strong thereby assuring lower energy prices. As early as 2012, environmentalists had begun petitioning EPA for direct regulation of methane from oil and natural gas production. As the Obama Administration swung from building a strong American energy base to a new international climate role, its interest in aggressively federalizing oil and natural gas production regulation returned. Throughout 2014, environmentalists and industry were actively advocating regarding the need for additional regulation and its pathway.

At the heart of these deliberations was the argument over VOC versus methane regulation under the CAA. VOC is a criteria pollutant under the CAA. This means that the Act sets the regulatory options for both new and existing facilities. New and modified sources are regulated through NSPS, like Subpart OOOO. Existing VOC sources are regulated under the programs related to attainment of National Ambient Air Quality Standards (NAAQS) – in the case of VOC, the NAAQS for ozone. The CAA requires states with areas failing to attain a NAAQS to develop State Implementation Plans (SIPs) to reduce emissions. Ozone is particularly complex and Part D of the CAA sets out detailed requirements for areas to meet or to attempt to meet the ozone NAAQS.

Concurrent with the deliberations regarding its Climate Action Plan, the Obama Administration was considering revision of the ozone NAAQS. At issue was whether to lower the NAAQS and, if so, to what level. Lower levels of the ozone NAAQS would make more of the country nonattainment thereby requiring revised SIPs and bringing areas with existing oil and natural gas production under new regulation.

Methane is not a CAA criteria pollutant. However, EPA can develop NSPS for non-criteria pollutants – as it was doing for carbon dioxide. Environmentalists aggressively insisted on the Obama Administration regulating methane because of its desire to shut down existing oil and natural gas production operations. If EPA promulgates a NSPS for a non-criteria pollutant, the CAA creates a pathway to nationwide existing source regulations for those facilities (Section 111(d)). Consequently, if EPA regulated methane rather than VOC, existing sources could be subject to regulation on a national basis rather than an ozone nonattainment area basis.

Existing source oil and natural gas production regulation is particularly threatened because of the large number of low production oil and natural gas wells – marginal wells. Approximately 80 percent of American oil wells and two-thirds of American natural gas wells are marginal wells. The average marginal oil well produces about 2.2 barrels per day and the average marginal natural gas well produces about 22 mcf per day. Yet, collectively, these wells produce 10 to 20 percent of U.S. oil and 12 to 13 percent of U.S. natural gas. These wells are overwhelming small business operations and are the most economically vulnerable in the current price environment. Consequently, imposing costly regulations on these small sources will result in their shut down.

In January 2015, the Obama Administration announced the scope of its Climate Action Plan for methane emissions. At its heart was a new goal to cut methane emissions from the oil and gas sector by 40 – 45 percent from 2012 levels by 2025. For the oil and natural gas production industry, the announcement identified several key initiatives. First, EPA indicated that it would "…issue a proposed rule in the summer of 2015 and a final rule will follow in 2016." It would "…consider a range of common-sense approaches that can reduce emissions from the sources discussed in the agency's Oil and Gas White Papers, including oil well completions, pneumatic pumps, and leaks from well sites, gathering and boosting stations, and compressor stations." Second, EPA would "…develop new guidelines to assist states in reducing ozone-forming pollutants from existing oil and gas systems in areas that do not meet the ozone health standard and in states in the Ozone Transport Region." Third, EPA would "… explore potential regulatory opportunities for applying remote sensing technologies and other innovations in measurement and monitoring technology to further improve the identification and quantification of emissions and improve the overall accuracy and transparency of reported data cost-effectively." Fourth, BLM would "…update decades-old standards to reduce wasteful venting, flaring, and leaks of natural gas, which is primarily methane, from oil and gas wells."

These initiatives theoretically hinged on the need to meet a specific 40-45 percent reduction target. For the oil and natural gas production segment of the industry, the Gas STAR program and the 2012 Subpart OOOO regulations were producing the targeted reduction without additional regulation. Data showed that – throughout the extensive expansion of American natural gas production resulting from shale gas development – emissions were falling. Ignoring the clear history of falling emissions with increased production, the Obama Administration concluded that expanded production would increase future emissions. While such an argument might have bearing in other industry segments, for oil and natural gas production the inherent decline that occurs in all wells means that maintaining and growing production requires new wells to replace old ones. Therefore, in the time window of 2012 to 2025, the pool of American production wells would be dominated by wells drilled with the new technologies. Consequently, justifying the expanded regulatory agenda required the Obama Administration to change emissions projections.

EPA Proposes Methane Regulations

In late 2015, EPA proposed its package of regulations. For oil and natural gas production facilities it included an expansion of NSPS – Subpart OOOOa, a new Control Techniques Guidelines (CTG) for existing sources in ozone nonattainment areas, and a revised voluntary reduction program replacing Gas STAR. Importantly, the NSPS targeted methane reductions and included a REC program for associated gas from fractured crude oil wells, mandates for pneumatic pumps, and an extensive fugitive emissions program.

The proposal created several contentious issues. First, as noted above, was whether the additional regulations were justified. Second was the selection of methane as the targeted emission because of the potential for the creation of nationwide existing source regulations. Third was the specific requirements of the fugitive emissions program. The fourth related to the CTG proposal. And, fifth was the nature of the voluntary program named The Methane Challenge by EPA.

EPA's decision to choose methane regulation was a linchpin to obtain support from the Keep It in the Ground environmentalists. They primarily focused on developing regulations on existing sources and the methane choice opened that pathway through Section 111(d) of the CAA.

The fugitive emissions issue largely revolved around three factors. First, several states had implemented or were developing fugitive programs, but none of them paralleled the EPA proposal. Since BSER should be based on adequately demonstrated technologies, this inconsistency raised a fundamental question of whether the EPA proposal was BSER. Second, a key component of the EPA proposal was its Leak Detection and Repair (LDAR) requirements. EPA's LDAR program relied on highly costly optical gas imaging (OGI) that raised significant cost effectiveness issues depending on the size of the operation. Third, the proposed rule exempted low producing wells from these requirements, but the process was uncertain. And, its inclusion was strongly opposed by the environmental lobby.

The CTG proposal raised two significant questions. First, if EPA was regulating methane in the NSPS and thereby opening the path to nationwide existing source regulation, a VOC CTG created a second existing source federally generated requirement. EPA suggested that the CTG would be the existing source program, but this view was not endorsed elsewhere in the Obama Administration. And, environmentalists were insisting that once EPA acted on a methane NSPS, it must then regulate existing sources under Section 111(d) – a position that EPA disputed. Second, the CTG essentially based its regulations on the NSPS Subpart OOOO and proposed Subpart OOOOa technology. But, even if the NSPS regulations could be viewed as BSER, CTG are based on Reasonably Available Control Technology (RACT). BSER is not RACT and the technology test is particularly different in assessing its impact on old and small facilities.

While EPA was touting its Methane Challenge as comparable to Gas STAR, industry viewed it as very different, particularly in the context of a massive regulatory initiative. While industry sought to develop a voluntary program that it could embrace as it had Gas STAR, the Methane Challenge did not offer incentives encouraging participation. For example, participation in the Methane Challenge did not prevent EPA from imposing additional regulation that would overlay the voluntary technology placing industry in a position of essentially being regulated twice. Without such incentives, industry had little interest in embracing the Methane Challenge.

Responding to the proposed requirements, industry challenged the Obama Administration justification that these additional regulations were needed to counter increasing methane emissions. Part of the challenge related to the turnover in wells to those with the Subpart OOOO technology during the 2012 to 2025 period. Part of the challenge focused on the small contribution of oil and natural gas production to total GHG emissions. In late 2015-early 2016, EPA countered by changing its calculation of oil and natural gas production emissions estimates in the GHGI. To put this revision in context, a brief discussion of the GHGI is necessary. Not all oil and natural gas production facilities report under Subpart W. EPA set a threshold to limit the burden on small producers and to reflect that smaller wells emit less. Consequently, when it added oil and natural gas production to the GHGI, EPA announced that by obtaining data from about 30 percent of producers, it would capture 85 percent of the GHG emissions. This was logical because the 70 percent of producers not reporting would be the small production wells. Suddenly, in 2015, EPA announced its intent to change the estimating process because of information it had on pneumatic controllers showing higher than previously estimated emissions. However, rather than follow its prior approach, EPA announced that it would revise emissions estimates based on scaling up the reported emissions based on producers. It thereby attributed 70 percent of the emissions to the small wells. This outrageous redistribution of emissions clearly created a basis to imply that there was a need to impose greater regulations. Additionally, EPA gratuitously added emissions from gathering and boosting operations to the production sector.

EPA Regulations Finalized – Litigation Follows

In March 2016, EPA announced its NSPC regulatory package which became effective in June 2016. The package was largely unchanged from the proposal with one significant exception. EPA had deleted the exclusion for low production wells. Environmentalists characterized this deletion as the single, most important provision in the package. They then demanded that EPA act under Section 111(d) on existing sources. EPA declined to act immediately but announced that it would be initiating an Information Collection Request (ICR) to gather information on existing oil and natural gas production.

EPA's action to remove the low production well exclusion is instructive in understanding the issues associated with EPA's technical support for its actions. As described above, EPA has a responsibility under the CAA to determine BSER for NSPS regulations. From the time EPA entered into the consent decree that led to Subpart OOOO, EPA's technical information development consisted largely of the creation of five white papers – papers that were an amalgamation of studies undertaken by others. EPA sought comments and created some working groups. But, EPA did not develop its own data. This is a fundamental and unsettled issue regarding what responsibility EPA bears to assure that its regulatory judgments are sound.

Regarding the decision to eliminate its proposed NSPS low production well exclusion, EPA relied on a study developed by the Environmental Defense Fund (EDF) that was submitted to the record. Although EPA had proposed the exclusion and industry had supported it, EPA then removed the exclusion arguing that counter information had been submitted – the EDF study – and it had not been refuted. Yet, EPA did nothing to assess the validity of the EDF study.

The purpose of the EDF study was to contort available methane sampling data to create the illusion that low producing wells were "super-emitters". All of the underlying studies generated their data by driving vehicles with samplers downwind of production sites, hunting for methane plumes. None of them used samples taken on the production site. This creates two issues. First,

it measures everything emitted at the site – fugitive emissions and permitted vents. Second, the data are collected over minutes – maybe over an hour – but not over a day. The data in the study are presented as if they were daily emissions but the studies merely scale up hourly estimates. Consequently, an emission that might occur for several hours, but not the full day, would be overstated. The study shows emissions as a percentage of production rather than actual emissions. Thus, one mcf emitted out of ten mcf produced is 10 percent, but 50 mcf emitted out of 1000 mcf produced is 5 percent. As a result, it skews the perception of the data to imply that low producing wells are large emitters when they are not. The study's production volumes are really sales volumes, not the amount extracted from the wellhead. Consequently, a "proportional loss rate" of 50 percent would be the calculated loss divided by the volume sold. If the percentage of loss were calculated based on extracted volumes, the 50 percent "proportional loss rate" would drop to 33 percent because the loss would be added to the sales volume to obtain the extracted volume. It only shows data from the 70th percentile of information. This excludes all of the virtually zero emissions that dominate the data. It uses a logarithmic scale to present the data. One of the reasons to use logarithmic scales is to flatten curves to make them look more like straight lines.

These observations can be made without conducting an intense investigation of the study. The study is obviously intended to contort data to create a specific result. Yet, with all the investigative power at EPA, with all of the research work EPA has conducted, EPA took this contrived study at face value to make its determination to remove the low producing well exclusion in the Subpart OOOOa regulations.

In October 2016, EPA finalized the CTG for existing sources which also included a fugitive emissions program but EPA deferred action on how to treat low production wells. This deferral has less meaning than NSPS action because CTG are a framework for states to develop their own regulations and are not specific mandates. However, if a state fails to adopt a CTG based regulation, it must adopt other regulations to achieve the calculated reductions in emissions that the CTG would have provided.

In November 2016, EPA finalized its ICR and began transmitting them to oil and natural gas producers. The ICR required substantial information that would take months to complete. However, the Obama Administration wanted to complete the ICR prior to its end and thereby required completion of the ICR prior to January 20, 2017. EPA was unable to distribute the ICR consistent with this schedule and the ICR remained active when the Trump Administration began.

Multiple parties responded to the Subpart OOOOa regulations seeking judicial repeal and administrative reconsideration in July-August 2016. The Independent Petroleum Association of America (IPAA) and 18 other trade associations, the American Petroleum Institute, the Western Energy Alliance, the Texas Oil and Gas Association, the Interstate Natural Gas Association of America, North Dakota, Texas, West Virginia and 13 other states filed to challenge the Subpart OOOOa regulations in the D.C. Circuit Court; the litigation was consolidated as *North Dakota v. EPA*. Additionally, the IPAA group and others filed petitions for reconsideration on several issues with EPA.

The Trump Administration Acts to Revisit the Regulations – Litigation Follows

With the advent of the Trump Administration, the dynamics of these regulations have changed, but the future is by no means certain.

In March 2017, EPA terminated the ICR following a request by eleven states.

In April 2017, EPA acted to put the *North Dakota v EPA* case in abeyance until it could reconsider the Subpart OOOOa regulations. In May 2017, the D.C. Circuit Court agreed.

In late May 2017, EPA announced a 90-day stay of several components of the Subpart OOOOa regulations including the fugitive emissions program that was scheduled to begin in June. A coalition of environmental groups filed action to block the stay. In mid-June, EPA proposed a two-year suspension of these components of Subpart OOOOa. On July 3, 2017, the DC Circuit Court agreed with the environmental groups and vacated the 90-day stay while mandating immediate application of the regulations. On July 7, 2017, EPA appealed the mandate and sought additional time. The Court sought responses to the EPA appeal during the week of July 11 and delayed the mandate for an additional 14 days to allow EPA to decide its next course of action. Meanwhile, the two-year suspension is undergoing its comment period under the Administrative Procedure Act. This issue of reconsideration will continue to be a ripe forum for litigation for the foreseeable future whether it is related to initiating reconsideration or the regulations that might ultimately be proposed.

Meanwhile, a number of governors have notified EPA that they intend to sue EPA for failing to initiate existing source methane regulations under Section 111(d).

Separately, the CTG for existing sources is becoming an issue in state planning. Although EPA promulgated a revision to the ozone NAAQS in 2015, the revision is being litigated. The Trump Administration has indicated that it may reconsider the revised NAAQS. As a predicate to that action, EPA announced that it will delay requirements for states to submit SIPs; litigation has been initiated to challenge this delay. However, due to its action to revise the ozone NAAQS in 2015, EPA failed to have states submit SIPs to address the 2008 revisions to the ozone NAAQS. Subsequent litigation resulted in EPA being ordered to pursue those SIPs. States are now considering regulations and, since the existing source CTG was finalized in October 2016, it is now a CTG that must be included in state planning. Consequently, this CTG – based on NSPS regulations that are being reconsidered – is now in play for small business wells.

Additionally, in January 2016, BLM proposed its methane regulations that include specific requirements for existing sources on BLM managed resources. These regulations largely track the CTG requirements. The regulations were finalized in November 2015 and were challenged in the Wyoming District Court. Congress attempted to rescind the regulations using the Congressional Review Act (CRA) but it failed. BLM moved to pause the regulations while it reconsiders them. New Mexico and California are acting to challenge the BLM action.

A Future of Regulatory Litigation and Chaos

Clearly, the confrontations over federal methane regulation of oil and natural gas production will continue and escalate. These regulations were driven to final action during the waning days of the Obama Administration. They are built on a characterization of emissions that is false. They fly in the face of a history of methane reductions in the oil and natural gas production segment of the industry and continued expectations of declining emissions in future years. They have become the hyperbolic political fodder for the Keep It in the Ground environmental movement that twists information to pursue its specific agenda.

However, they will also be a part of a larger fabric of litigation that is going to test the nature of America's federal environmental laws and its administrative procedural process. Substantive

issues will be subordinated to procedural ones. The challenges of unwinding the current regulations from the judicial process, developing revisions and moving those proposals to completion will test the remaining years of the Trump Administration. EPA's last Obama Administrator once said about regulation of oil and natural gas production:

> EPA's learning this industry right now because it is not an industry we regulate. We've just gotten into regulation of this so there's a lot of hundreds of thousands of small sources and EPA does not generally have a relationship with this industry as we do other sectors that we've regulated for frankly decades. But we are learning.

Unfortunately, EPA began regulating before it learned. Unlike most industries, oil and natural gas production begins to decline soon after it starts. The industry is comprised of large and small businesses with most low producing wells operated by small businesses. Regulations that might be cost effective when a well is new will not be after it declines and certainly when it is a low producing well. Many of the technologies that these regulations require and use are cost effective for new, large, hydraulically fractured oil and natural gas wells, but others need to revisited. Then, at issue will be whether regulations are needed for America's marginal wells and, if so, whether regulations can be created to manage marginal well emissions rather than force them to be shutdown.

While the federal framework on methane regulations – and other Obama Administration initiated regulations and policies – is wrapped up in aggressive changes by the Trump Administration, Keep It in the Ground environmentalists are not only reacting in the federal court and regulatory agency arena but turning to other venues as well. State regulations will be one target. Using the same arguments – and same specious data – the environmental lobby will be pursuing its agenda by trying to get state legislators and regulators to adopt regulations comparable or more excessive than those promulgated by the Obama Administration. It will continue to litigate and petition for action on the federal level to try to drive or, at least, constrain the federal agenda. And, it will likely seek venues for citizen suits against individual companies.

On balance, the next several years will be challenging for all parties as the nature of the regulatory process – federal and state – and the dynamics of litigation will be tested – more on procedure than substance.