INDEPENDENT PETROLEUM
ASSOCIATION OF NEW MEXICO

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US EPA Office of Air Quality
Planning and Standards (OAQPS)
Raleigh, NC
By email: oilandgas.whitepapers@epa.gov

Re: IPANM comments to OAQPS Oil and Natural Gas Sector Completions: Hydraulically Fractured oil wells Whitepaper

Dear Sir or Madam;

The Independent Petroleum Association of New Mexico ('IPANM') appreciates this opportunity to comment to the EPA Office of Air Quality Planning & Standards (hereinafter 'EPA') whitepaper on Oil and Gas Sector Completions: Hydraulically Fractured oil wells of April 2014.

Preliminary matters:

Without adequate research and an expert understanding of the issues, it would be unethical for the EPA to move forward with promulgating methane reductions policy or rules at this time. The whitepapers and studies cited therein do not appreciate that the issues around methane reductions are complex and very dynamic. In fact, since the introduction of the First Assessment Report (FAR) of the Intergovernmental Panel of Climate Change (IPCC 1990), there has been vigorous discussion about whether global warming potential (GWP) to compare different gases on a CO2 equivalent scale should be

the accepted methodology to understand the true impacts of methane.[1] [2] As recently as last month, MIT researchers published a letter, titled, "*Climate impacts of energy technologies depend on emissions timing"* in *Nature Climate Change* stating that the static nature of GWP to compare gases with differing radiative efficiencies and atmospheric lifetimes has led to 'major shortcomings' in understanding energy technology valuations[3]. However, in the urgency to complete methane reductions regulations by the end of 2016, the Whitehouse has directed the EPA draft whitepapers and convene peer review panels to give the agency a 'robust understanding' of the issues. IPANM would contend that these whitepapers were obviously rushed, had a limited and biased selection of studies and we question the efficacy of the peer review process. We hope that the agency would proceed with this process in a manner that allows for true stakeholder involvement and opportunity for comment as required in the federal Administrative Procedures Act. Finally, we would urge the agency to use the resources and expertise available at the New Mexico Petroleum Recovery Research Center to learn about the unique characteristics of oil and gas operations in the San Juan and Permian basins. Within the PRRC is the Research Partnership to Secure Energy for America (RPSEA), Small Producer Program which is a public/private partnership funded by the U.S. DOE through the National Energy Technology Laboratory. The Small Producer Program aims to develop and apply technology that enhances small producer production, and thereby contributes to the nation's energy supply. The PRRC/New Mexico Tech was

[1] Shine,K. "*The global warming potential – the need for an interdisciplinary retrial"* Climactic Change Journal, Oct. 2009, vol. 96, issue 4, p. 467-472.

[2] Even as one of the lead authors of one of the chapters of the first IPCC report, Dr. Shine questions whether using the 'simple approach' of global warming potential metrics improperly influenced a 'major piece of environmental legislation' (Kyoto Protocol) that could impact 'big investment and policy. '

[3] Edwards, M. & Trancik, J., "*Climate Change of energy technologies depend on emissions timing"*, Nature Clim. Change Letter, May 2014,

chosen to lead the SP program because of their track record of research and actions on behalf of small oil and gas producers, for whose benefit our organization was established. IPANM would also be happy to provide additional input to the EPA in the development of policy, rules and regulation on methane reduction strategies.

Who is IPANM:

The Independent Petroleum Association of New Mexico, IPANM, represents several hundred independent oil and gas producers who live, work and employ New Mexicans. We are small, with, on average, 25 employees who often wear multiple proverbial hats, but we provide enough revenue to the State of New Mexico to support 31% of the General Fund[4]. We strive to be stewards of the land in a state where nearly 41.8% of the land is federally owned. The Bureau of Land Management New Mexico office manages one of the largest oil and gas programs in the agency controlling 13.4 million acres of public lands and 26 million subsurface acres of federal oil, natural gas, and minerals. There are currently 30,561 active wells on federal lands[5] ranking New Mexico sixth in crude oil production in the nation in 2013[6]. New Mexico's marketed production of natural gas accounted for 4.8% of U.S. marketed natural gas production in 2012, despite a decline in production of 20% between 2007 and 2012[7]. According to the Office of Natural Resources Revenue, in FY 2013 the Federal Government disbursed $478,732,193.90 in revenues to New Mexico[8], which is only 48% of the total royalty revenues collected for oil and gas operations on NM federal lands.

[4] "Fiscal Impacts of Oil and Natural Gas Production in New Mexico: Preliminary report", New Mexico Tax Research Institute, Jan 2014.
[5] http://www.emnrd.state.nm.us/OCD/documents/OCD%20Well%20Statistics03272014.pdf
[6] http://www.eia.gov/state/?sid=NM
[7] Id.
[8] http://statistics.onrr.gov/ReportTool.aspx

The process by which these whitepapers were developed was flawed and requires more study and expert understanding of the issues.

Regulation in the air quality arena is not new, however, IPANM would contend that the process by which the Whitehouse, through the EPA and the BLM, is seeking to implement new or substantially expanded methane reduction strategies, is not tenable[9]. Note that IPANM does not contest the authority of the EPA to regulate Greenhouse Gas emissions[10], of which methane is a part of those emissions[11]. The authority under the Clean Air Act and a growing body of case law, grants the complex balancing of "national and international policy against environmental benefit, our nation's energy needs and the possibility of economic disruption" solely on the Environmental Protection Agency. *See*, *American Electric Power v. Connecticut*, 131 S.Ct. 2527, 564 U.S. ___ ,slip op. 10-174 at 13 (2011). Indeed, through out the *American Electric* decision, the US Supreme Court justices refer to the EPA as the "experts"[12] in greenhouse gas and air quality matters. In the Administration's "2014 Climate Action Plan: Strategy to reduce methane emissions[13]", the President orders the BLM, the EPA, USDA, DOE and even international agencies to target key sources including landfills, coalmines, agriculture and the oil and gas sector and to

[9] IPANM does contend that the statutory jurisdiction to regulate methane reductions lies exclusively with the EPA and not the BLM which is attempting to regulate methane emissions under the guise of a prevention of waste legal theory.

[10] In *Massachusetts v. EPA*, 549 U. S. 497 (2007), the US Supreme Court held that the Clean Air Act, 42 U. S. C. §7401 et seq., authorizes federal regulation of emissions of carbon dioxide and other greenhouse gases, including methane.

11 IPANM does, however, contest the science behind the policy for reducing human caused methane sources. Several of our members pointed out in response to this exercise that the science of global warming and impacts of human activities have not been settled yet. In 2012, CH4 accounted for about 9% of all U.S. greenhouse gas emissions from human activities. But water vapor in the atmosphere is responsible for 95 percent ofthe greenhouse effect and CO2 is responsible for 3.6 percent. A study from MIT reported on 5/30/07 said that 97% of all greenhouse gases are naturally occurring, and the remaining 3% are caused by man. So methane is only 3% of the 9%. Insignificant.

[12] *American Electric Power v. Connecticut*, 563 US _____, slip op. at p. 3, 16,17,18

[13] March 2014 Climate Change Strategy: Reduction of Methane Emissions, found at http://www.whitehouse.gov/sites/default/files/strategy_to_reduce_methane_emissions_2014-03-28_final.pdf,

promulgate rules to reduce methane emissions. The White House specifically directs[14] the BLM to propose updated standards to reduce venting and flaring[15,] and mandated the EPA to draft white papers focusing on technical issues relating to methane emissions from "oil and co-producing wells, liquids unloading, leaks, pneumatic devices and compressors" to "solicit input from independent experts[16]" (hereinafter referred to as the EPA methane papers). The EPA was further ordered to use these documents to "solidify its understanding of these potentially significant sources of methane."

The EPA methane papers came out for peer review and comment one month after the release of the Whitehouse report with only 60 days[17] to comment on nearly 300 pages of technical data. The Whitehouse report also directed the agency to convene peer review panels, which was done, but those panels only consist of 5 persons per panel, and not one single small independent was included on any panel. It is interesting to note that the Environmental Defense Fund, however, was included on every panel thereby giving that group a significant voice in this process.

From a detailed review of the EPA methane papers, it is obvious that the authors were clearly limited, probably due to time constraints, to a small subset of studies that were often out of date, had poor sampling criteria, had wildly inaccurate extrapolation factors or cite to each other as 'science'. Of the few studies the EPA relied upon, every

[14] President's Methane Reduction Strategy, page 2, 9.

[15] The BLM Venting and Flaring public outreach sessions were conducted in North Dakota, New Mexico and Washington DC. IPANM has submitted substantive comments to the BLM on their May 2014 Venting & Flaring proposal and would urge both the BLM and this agency to include IPANM, PRRC or RPSEA (see discussion above) in future stakeholder discussions.

[16] Id. at 8 par. 2.

[17] 60 days to read and digest nearly 300 pages of technical information was very difficult. To require industry to commission, prepare and present data to augment the very weak studies relied upon by the EPA was impossible. In addition, the timeframe set did not avail IPANM the ability to structure studies with the New Mexico Petroleum Research Recovery Center or RPSEA who are the entities often commissioned for such work.

whitepaper referenced a study commissioned by the Environmental Defense Fund that reviewed only 22 sources of emissions. IPANM strongly contests the use of this paper as the assumptions used are wildly inaccurate. First, the average $4mcf value is high, particularly for smaller operators who received much less on average during most of 2012 and 2013[18]. Second, the base assumption that the cost of flaring is only $3523 per well ignores the true costs which, by IPANM member review, were well in excess of $10,000 per well because of the equipment rental, mileage, time and personnel time to operate the equipment. As noted earlier in this comment, the small producer has significantly different economics than major companies who employ personnel versus hiring consultants or contractors at market rate to conduct a test or an emergency procedure such as a flare or venting during liquids offloading. The misuse of the cost figures which ICF then extrapolated to estimate savings on a nationwide basis renders the EDF study close to meaningless as a foundation for a Whitehouse methane reduction strategy. Clearly, the manner in which the EPA researched the issues raised in the whitepapers was nothing more than a 'data dump' that could not be considered an adequate learning process to establish expertise on these very complex matters. IPANM contends that based on the inadequate information reviewed, that the EPA does not have any sort of a 'robust understanding[19,' of these sources of methane thus, moving forward with policy or rule promulgation is premature at this time.

[18] http://gotech.nmt.edu/gotech/Marketplace/year_prices.aspx?year=2013

[19] In the President's Climate report ordering EPA to complete the whitepapers, the Whitehouse assumes that completion of the papers would result in 'robust technical understanding' of the issues. IPANM contends that in every instance that the studies used and the lack of data does not give EPA regulators the required understanding of the issues to establish policy.

In addition, IPANM would urge the EPA to review and completely understand the information included in the National emissions inventory and information submitted pursuant to the recently promulgated NSPS SubPart OOOO amendments[20]. This data will provide a large amount of information about emissions at oil and natural gas facilities but experts who understand industry must study and understand the information prior to establishing policy. [21] NSPS SubPart OOOO requires federal air standards for new natural gas wells that are hydraulically fractured, along with requirements for several other sources of volatile organic compound (VOC) emissions from new storage vessels, newly installed compressors, pneumatic controllers and equipment leaks at natural gas facilities. Although the New Source Performance Standards directly regulate VOC emissions, in a Government Accounting Office report issued May 16, 2014, the EPA reports that the control requirements of NSPS SubPart OOOO substantially reduces methane emissions [22]. Concurrent with the NSPS, in April 2012, EPA published final National Emission Standards for Hazardous Air Pollutants, updating its air toxics standards for oil and natural gas[23]. These standards cover hazardous air pollutants emitted from glycol dehydrators—used to remove water from gas—and storage vessels, and equipment leaks at natural gas processing plants. Use of actual measurement from locations is obviously better towards

[20] U.S. EPA, Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews Final Rule, 77 Fed.Reg. 49490 (Aug. 16, 2012) (codified at 40 C.F.R. Parts 60 and 63).

[21] IPANM would urge the reviewers to look at the UT study that clearly explains differences in modeling based numbers used in the National Emissions Inventory versus actual measurements on location. We would caution against exclusive use of this study, however, since the measurements used were from shale formations only. See, Proceeding of the National Academy of Sciences of the United States of America (PNAS). 2013. Measurement of Methane Emissions at Natural Gas Production Sites in the United States. August 19, 2013. Available at http://www.pnas.org/content/early/2013/09/10/1304880110.abstract..

[22] GAO-14-238; Oil and Gas, Updated Guidance, Increased Coordination, and Comprehensive Data Could Improve BLM's Management and Oversight, page 23

[23] 77 Fed. Reg. 49490 (Aug. 16, 2012) (codified at 40 C.F.R. Parts 60 and 63).

building an understanding of the issue of methane emissions, which is what we believe the agency is attempting with the recent implementation of the NSPS regulations. We would urge the EPA not to rush to creating regulations for all new and existing oil and gas locations to reduce methane emissions without a solid understanding of the actual impacts[24] of methane emissions on human health and the environment or the actual levels emitted from all types of oil and gas sources.

Specific Comments BY IPANM Members to April 2014 Whitepaper, "Oil and Natural Gas Sector Hydraulically Fractured Oil Well Completions and Associated Gas during Ongoing Production"

Preliminary comment:

If the States share responsibility for air quality, any regulation or permitting should be at the State level. Since flaring is a short-term event, until infrastructure is built, permitting should be simple and dovetail with existing rules.

Question: Why is the EPA declining to define what an 'oil well' is for purposes of methane emissions?

1. Page 4, paragraph 3 "very high pressure" A large portion of the observed surface pressure is lost due to friction in the "treating conduit", so the BHTP is much lower.

2. Page 4, paragraph 3 "water emulsion" is not a correct term. Most frac fluid is water with a viscosifier, such as guar gum, added to increase viscosity.

3. Page 12, last paragraph, during a typical load recovery, only small amounts of oil and gas are recovered until approximately half of the load is recovered.

[24] Edwards, M. & Trancik, J., "*Climate Change of energy technologies depend on emissions timing"*, Nature Clim. Change Letter, May 2014. The actual impact of methane from different energy sources is substantially different than previously believed using the very simplistic GWP modeling. The MIT researchers advocate the use of dynamic modeling that better accounts for the differing radiative efficiencies and atomospheric lifetimes of different gases. In essence, the comparison of gases must be dependent on the timing of the emissions. The researchers note that while it might be in vogue to tout the disasterous health effects of emissions from coal-fired plants as a policy determination to support natural gas plants, three decades from now, the emissions advantages of natural gas as compared to coal would be half of the levels claimed in the GWP modeling.

4. Page 12, paragraph 2, a recompletion may have minimal emissions if the producing equipment and pipeline are in place.

5. Page 27, 5.2 Completion Combustion Devices – Combustion devices are used as a safety measure to prevent gas from collecting that would be in the combustible range imposing a safety hazard.

6. Page 30, 5.3.1 NGL Recovery – short term small scale NGL recovery, storage and transportation facilities are uneconomical.

7. Page 35, 5.3.2 Natural Gas Reinjection – Gas reinjection requires one or more injection wells and a large investment in compression. Also, "tite" formations such as the Bakken do not have sufficient permeability to allow large volumes of gas to be injected and to be mobile within the reservoir.

8. Page 38, 5.5.3 Electrical Generation – Relative small volumes of gas are needed for onsite electrical needs, 20 MCFD will generate approximately 100 H.P. Also, electrical infrastructure in remote locations cannot accommodate large volumes of excess electrical power.

7.0 Charge Questions for Reviewers

1. Please comment on the national estimates and per well estimates of methane and VOC emissions from hydraulically fractured oil well completions presented in this paper. Are there factors that influence emissions from hydraulically fractured oil well completions that were not discussed in this paper?

The reservoir G.O.R. varies widely for different reservoirs. The reservoirs used in this study are typically high G.O.R. hydrocarbon systems.

2. Most available information on national and per well estimates of emissions is on uncontrolled emissions. What information is available for emissions, or what methods can be used to estimate net emissions from uncontrolled emissions data, at a national and/or at a per well level?

To be accurate, data needs to be on a per well level.

3. Are further sources of information available on VOC or methane emissions from hydraulically fractured oil well completions beyond those described in this paper?

Yes, but it's hard to acquire and is not complete.

4. Please comment on the various approaches to estimating completion emissions from hydraulically fractured oil wells in this paper.

- *Is it appropriate to estimate average uncontrolled oil well completion emissions by using the annual average daily gas production during the first year and multiplying that value by the duration of the average flowback period?*
- *Is it appropriate to estimate average uncontrolled oil well completion emissions using "Initial Gas Production," as reported in DI Desktop, and multiplying by the flowback period?*
- *Is it appropriate to estimate average uncontrolled oil well completion emissions by increasing emissions linearly over the first nine days until the peak rate is reached (normally estimated using the production during the first month converted to a daily rate of production)?*
- *Is the use of a 3-day or 7-day flowback period for hydraulically fractured oil wells appropriate?*

Load recovery and testing may take a few days, a few weeks or a few months, every well is different.

5. Please discuss other methodologies or data sources that you believe would be appropriate for estimating hydraulically fractured oil well completion emissions.

Individual well tests

6. Please comment on the methodologies and data sources that you believe would be appropriate to estimate the rate of recompletions of hydraulically fractured oil wells. Can data on recompletions be used that does not differentiate between conventional oil wells and hydraulically fractured oil wells be reasonably used to estimate this rate? For example, in the GHG Inventory, a workover rate of 6.5% is applied to all oil wells to estimate the number of workovers in a given year, and in the ERG/ECR analysis above a rate of 0.5% is developed based on both wells with and without hydraulic fracturing. Would these rates apply to hydraulically fractured oil wells? For hydraulically fractured gas wells, the GHG Inventory uses a refracture rate of 1%. Would this rate be appropriate for hydraulically fractured oil wells?

More mature areas should have a higher recompletion rates.

7. Please comment on the feasibility of the use of RECs or completion combustion devices during hydraulically fractured oil well completion operations. Please be specific to the types of wells where these technologies or processes are feasible. Some characteristics that should be considered in your comments are well pressure, gas content of flowback, gas to oil ratio (GOR) of the well, and access to infrastructure. If there are additional factors, please discuss those. For example, the Colorado Oil and Gas Conservation Commission requires RECs only on "oil and gas wells where reservoir pressure, formation productivity and wellbore conditions are likely to enable the well to be capable of naturally flowing hydrocarbon gas in flammable or greater concentrations at a stabilized rate in excess of five hundred (500) MCFD to the surface against an induced surface backpressure of five hundred (500) psig or sales line pressure, whichever is greater."

Gas volumes need to be sufficient to justify REC's. Combustion devices can be used on most wells and most areas have suppliers that can rent or lease equipment for short periods of time.

8. Please comment on the costs for the use of RECs or completion combustion devices to control emissions from hydraulically fractured oil well completions.

Depending on the distance to a pipeline and processing/separation requirements, REC's are multiply times more expensive than combustors.

9. *Please comment on the emission reductions that RECs and completion combustion devices achieve when used to control emissions from hydraulically fractured oil well completions.*

Rec's and combustion devices can reduce emissions by +95%.

10. *Please comment on the prevalence of the use of RECs or completion combustion devices during hydraulically fractured oil well completion and recompletion operations. Are you aware of any data sources that would enable estimating the prevalence of these technologies nationally?*

My experience is, on any completion that produces gas a REC, combustion device or flare is used to prevent a safety hazard and safely dispose of produced gas. I know of no data sources to estimate these technologies nationally.

11. Did the EPA correctly identify all the available technologies for reducing gas emissions from hydraulically fractured oil well completions or are there others?

EPA identified the available technologies.

12. Please comment on estimates of associated gas emissions in this paper, and on other available information that would enable estimation of associated gas emissions from hydraulically fractured oil wells at the national- and the well-level

Applying a small data set nationally has inherent errors.

13. Please comment on availability of pipeline infrastructure in hydraulically fractured oil formations. Do all tight oil plays (e.g., the Permian Basin and the Denver-Julesberg Basin) have a similar lack of infrastructure that results in the flaring or venting of associated gas?

Some areas have pipelines close to new areas and some don't.

14. Did the EPA correctly identify all the available technologies for reducing associated gas emissions from hydraulically fractured oil wells or are there others? Please comment on the costs of these technologies when used for controlling associated gas emissions from hydraulically fractured oil wells. Please comment on the emissions reductions achieved when these technologies are used for controlling associated gas emissions from hydraulically fractured oil wells.

See #11, #7, #8 and #9.

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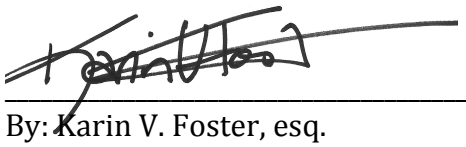
15. Are there ongoing or planned studies that will substantially improve the current understanding of VOC and methane emissions from hydraulically fractured oil well completions and associated gas and available options for increased product recovery and emission reductions?

Unknown.

IPANM thanks the EPA for the opportunity to comment on the Oil and gas Sector Hydraulically Fractured Oil Well Completions and Associated Gas during Ongoing Operations whitepaper. We would be interested in participating in any stakeholder/taskforce/peer review groups convened for the purpose of addressing these policy proposals. We look forward to providing additional comments as the agency drafts of these proposed regulations materialize. Please feel free to contact me at Karin@ipanm.org or at (505) 238-8385 if you have any questions regarding the issues.

Respectfully submitted,

INDEPENDENT PETROLEUM ASSOCITION OF NEW MEXICO



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