Reply Comments of Independent Petroleum Association of America and

Energy in Depth on DOE LNG Export Study

I. Introduction

The Independent Petroleum Association of America ("IPAA") represents the companies that drill 95 percent of America's onshore and offshore oil and natural gas wells. America's independents produce 54 percent of American oil and produce 85 percent of American natural gas. Energy In Depth (EID) is a research, education and public outreach campaign focused on getting the facts out about the promise and potential of responsibly developing America's onshore energy resource base – especially abundant sources of oil and natural gas from shale and other "tight" reservoirs across the country. EID is supported by a number of state associations representing natural gas producers, as well as individual companies.

In the December 11, 2012 *Federal Register* notice requesting comment on the LNG export study, DOE specified, "Comments must be limited to the results and conclusions of [the EIA and NERA] independent analyses on the factors evaluated." Comments submitted on hydraulic fracturing would appear to be beyond the scope outlined by DOE. For example, the Natural Resources Defense Council ("NRDC") would have DOE "[t]horoughly consider[] the economic and environment impact in developing economies as part of the public interest inquiry…to determin[e] global economic, health and climate impacts on LNG exports" (NRDC comments, p. 2) IPAA and EID submit that much of the comments addressed in these reply comments are outside the scope and therefore should be disregarded as "not germane to the present inquiry." However, to the extent DOE considers comments addressing upstream production technology, IPAA and EID submit these comments to refute the initial submissions by the Sierra Club, Environmental Working Group ("EWG"), NRDC, and Delaware Riverkeeper Network, et al. ("Riverkeepers"). These comments included a series of statements about hydraulic fracturing that were inaccurate, misleading, and completely unsupported by the facts. What follows is a closer examination of those claims, followed by a discussion of what the facts actually show.

II. Reply Comments

Delaware Riverkeeper Network: *"…America's natural gas supply is finite, with approximately 20-40 years of supply at current domestic consumption."* (Riverkeepers comments, p. 3)

FACT: According to a report issued in April 2011, the Potential Gas Committee estimated U.S. natural gas reserves at 1.9 quadrillion cubic feet — the biggest number reported in the 46-year history of the Committee. See also Reply Comments of America's Natural Gas Alliance.

The Colorado School of Mines' Potential Gas Committee noted, "When the PGC's results are combined with the U.S. Department of Energy's latest available determination of proved dry-gas reserves, 273 Tcf as of year-end 2009, the United States has a total available future supply of 2,170 Tcf**,** an increase of 89 Tcf over the previous evaluation."

"The largest volumetric and/or percentage increases in individual resource categories … resulted mainly from reassessments of active and newly developing shale-gas plays…"

Sierra Club: "*In essence, LNG export transfers billions from the middle class to gas companies*." (Sierra Club comments, p. 6)

FACT: The Sierra Club wants us to believe that the increased natural gas development needed to meet demand for export projects would provide zero benefit to the middle class. This would be news to the thousands of families who have benefitted from shale development across the country: some from increased royalty payments (which help pay off debt and provide a much-needed new source of revenue) and others whose local businesses have been given a jolt from new customers.

As the Associated Press recently highlighted: "In Pennsylvania alone, royalty payments could top $1.2 billion for 2012," which have made a "big difference" for many landowners. The AP cites local farmer Shawn Georgetti, who said before drilling began that they had to "put stuff on credit cards" and were "basically living from paycheck to paycheck." Now, Georgetti has been able to invest in newer farm equipment – which is also more fuel efficient.

Nationwide, royalty payments were more than $20 billion in 2010 – money that flows to landowners and hardworking men and women, many of whom have struggled to pay the mortgage or keep their farms that have been in their families for generations.

Companies invest heavily in the communities in which they operate. For example, one company – Cabot Oil and Gas – helped raise more than $4.4 million for the construction of a new health care facility in Susquehanna County, Pa., which one local resident described as "sorely needed" and "the biggest project our County has ever seen."

Sierra Club: "*This failing is particularly relevant here, because the manufacturing and other jobs LNG exports and export-related production will eliminate are typically permanent positions, whereas the gas production jobs induced production will create typically do not provide sustainable, well-paying local employment*." (Sierra Club comments, p. 20)

FACT: The Sierra Club is arguing that gas production jobs are not sustainable, well-paying, or local. All of these are false. The following is a sampling of the headlines and local stories in the Marcellus and Utica shale regions:

- "Local business owners taking advantage of Marcellus Shale," Somerset Daily American, 8/23/2011
- "Shale industry impact felt locally," Standard Journal, 11/26/2011
- "With Marcellus Shale drilling becoming a major player in Pennsylvania's economy, the industry is now impacting other smaller businesses that can supply its needs," WJAC TV, 8/23/2011
- "Ohio shale drilling spurs job hopes in Rust Belt," AP, 11/27/2011
- "New Website Connects Small Businesses With Shale Boom," NPR, 3/6/2012
- "Shale drilling will play a role in Erie-area economy," Erie Times-News, 5/14/2012
- "Philadelphia Energy Solutions will create and maintain hundreds of skilled jobs for Philadelphians," Philadelphia Mayor Michael Nutter, 7/2/2012
    - NOTE: "Not only will good paying manufacturing jobs be saved, but new ones will be created as this vital facility is improved and expanded," United Steelworkers President Leo Gerard, 7/2/2012

- "Those working in West Virginia's oil and natural gas fields have seen their annual salaries grow by an average of $8,100 since 2008, thanks to the Marcellus Shale rush," Wheeling Intelligencer/News-Register, 12/6/2012

According to the Pennsylvania Department of Labor and Industry, of the new hires in Pennsylvania connected to Marcellus Shale development, 71 percent are Pennsylvania residents. Those jobs also pay salaries higher than the statewide average.

It's also worth noting that shale development itself results in well-paying manufacturing jobs. Drilling and production requires steel for new pipelines, machinery used on the wellpad, and numerous other pieces of equipment.

Sierra Club: "*LNG exports would also increase air pollution costs in other ways. They would, for instance, likely increase the use of coal-fired electricity, which imposes significant public health costs.*" (Sierra Club comments, p. 30)

FACT: Exported natural is consumed by countries that buy it. As we've seen here in the United States, increased natural gas use has also delivered significant environmental benefits.

For example, U.S. carbon dioxide emissions are at their lowest level in 20 years thanks in no small part to expanded natural gas utilization. In other parts of the world, CO2 and other greenhouse gas emissions are on the rise, a phenomenon former Pennsylvania DEP Secretary John Hanger attributes to the fact that only the United States is developing its shale gas resources on a large scale. Hanger has also said in the past: "Nothing has cut US emissions more than low natural gas prices made possible by the shale gas boom."

Natural gas is also reducing other toxic emissions, including U.S. EPA-designated hazardous air pollutants (HAPs). The Mid-Atlantic region, for example, saw a drop in toxic air pollutants thanks in large part of power plants using more natural gas.

In fact, none other than the Sierra Club itself has touted the health benefits of using more natural gas. Jennifer Feyerherm, a spokeswoman for the Sierra Club, stated recently that a Wisconsin state facility's decision to switch to natural gas for its boilers "should've been done years ago." Feyerherm added that, as a result of the use of natural gas in the boiler, "the emissions and human health impacts should be greatly reduced."

In as much as natural gas has helped reduce emissions in the United States, more affordable gas supplies in other countries can do the same. Given the global impact of greenhouse gas emissions, and the Sierra Club's stated mission to "protect the planet," one would think that the Sierra Club would support increased worldwide use of an emissions-reducing fuel.

Sierra Club: "*More recent work by National Oceanic and Atmospheric Administration ('NOAA') scientists suggest, based on direct measurement at gas fields, that this [methane] leak rate may be between 4.8% and 9%, at least in some fields.*" (Sierra Club comments, p. 31)

FACT: In the sentence immediately preceding this claim, the Sierra Club cites a report issued by the Environmental Defense Fund, so we know the Sierra Club thinks EDF is a credible voice on this subject. EDF had the following to say about this latest work from NOAA alleging leak rates as high as nine percent:

> "While the…studies offer valuable snapshots of a specific place on a specific day, neither is a systematic measurement across geographies and extended time periods and that is what's necessary to accurately scope the dimensions of the fugitive methane problem. *For this reason, conclusions should not be drawn about total leakage based on these preliminary, localized reports*. Drawing conclusions from such results would be like trying to draw an elephant after touching two small sections of the animal's skin: the picture is unlikely to be accurate."

EDF says no conclusions should be drawn from those limited and preliminary studies. Moreover, the same NOAA researchers issued a separate report last year that also suggested abnormally high leakage rates. So abnormal, in fact, that energy and climate change expert Michael Levi of the Council on Foreign Relations published a peer-reviewed comment on the report, pointing out all the flaws in data interpretation. Levi's conclusion: leakage rates are "most likely between 1 and 2 percent, very similar to what previous careful estimates have consistently indicated…"

As for the latest NOAA research, Levi said he was "genuinely shocked" by *Nature*'s decision to report on it. "Conference posters with no backup data/analysis should be treated as such," Levi tweeted. He also asked rhetorically: "Why believe the unreviewed results from a team whose last study was so deeply flawed?"

Sierra Club: *The following table is provided to show projected emissions by export volume* (Sierra Club comments, p. 31-32)

Export Volume in 2035 (bcf)	Methane (tons)	VOC (tons)	HAP (tons)
1% Leak Rate			
9,052 bcf	1,186,174	173,062.8	12,573.45
4,380 bcf	573,955.2	83,740.06	6,083.925
1,370 bcf	179,524.8	26,192.67	1,902.963
2.4% Leak Rate			
9,052 bcf	2,846,818	415,350.7	30,176.27
4,380 bcf	1,377,492	200,976.2	14,601.42
1,370 bcf	430,859.5	62,862.4	45,67.111
4.8% Leak Rate			
9,052 bcf	5,693,636	830,701.4	60,352.54
4,380 bcf	2,754,985	401,952.3	29,202.84
1,370 bcf	861,719	125,724.8	9,134.222
9% Leak Rate			
9,052 bcf	10,675,567	1,557,565	113,161
4,380 bcf	5,165,597	753,660.6	54,755.33
1,370 bcf	1,615,723	235,734	17,126.67

FACT: This certainly presents a large set of emissions possibilities, no doubt carefully and strategically planned by Sierra Club to convey an image of high emissions from natural gas development. The only

problem is that virtually all of these numbers – which extrapolate leakage scenarios across the entire spectrum of wells in the United States – are meaningless in the context of actual operations.

We know the nine percent and 4.8 percent leak rate figures are limited at best, and "conclusions should not be drawn" from them according to EDF. Already, half the chart is rendered moot. The 2.4 percent leak rate is EPA's estimate, which is based heavily off 1990s data – meaning the number is outdated and certainly not based on current, state-of-the-art natural gas systems. John Hanger, former Secretary of the Pennsylvania Department of Environmental Protection, describes the situation as follows:

> *Shale gas fields are newer and have better quality equipment, including gathering lines, compared to typically older, leakier conventional gas fields. Green completions also are already approximately 70% at shale gas wells, a rate likely much higher than at lower-volume conventional gas wells.*

A study from MIT – coauthored by a lead author of the IPCC's Fifth Assessment Report – has also noted that reduced-emission completions (aka "green completions") are much more widely used than assumed by other research, including that of the EPA. Meanwhile, data from the URS Corporation – based on 91,000 wells nationwide, the largest data set to date – show actual methane emissions during well completion are as much as 93 percent lower than EPA's estimates.

In that sense, only the one percent leak rate is really of use to this discussion, and, based on research from MIT and the URS Corporation, even *that* number is likely inflated. Nonetheless, the Sierra Club uses the table to claim that "the additional air pollution which would leak from the oil and gas system substantially erodes" the reductions projected by EPA's New Source Performance Standards (NSPS), "even at the lowest volume of LNG export and the lowest leak rate of 1%."

For the sake of argument, let's assume the one percent leakage rate isn't suspect, which means the highest possible methane emissions contrived by Sierra Club comes out to 1.2 million tons. Once again, even *that* is a gross exaggeration, because it is examining an export capacity that simply will not materialize. Instead, it's based on the total natural gas export capacity of all proposed export facilities. Whether it is an LNG export terminal or a new housing development outside of town, not all projects proposed in a diverse economy will come to fruition, and many that do will never hit full capacity.

The best analogy is wind power, which the Sierra Club strongly supports. A wind farm may have a large stated capacity, but the actual energy produced is typically only about one-third of that capacity.

The midpoint estimate of 4,380 bcf/year is the most likely of the scenarios envisioned – assuming the Department of Energy approves applications and does not impose new restrictions on exports, of course. That scenario has a projected (and likely inflated) methane emissions level about half that of the projected reductions from EPA's NSPS, which means the Sierra Club's alarmist accusation about emissions is without merit.

Sierra Club: "*Unsurprisingly, recent risk assessments from Colorado document elevated health risks for residents living near gas wells. Indeed, levels of benzene and other toxics near wells in rural Colorado were 'higher than levels measured at 27 out of 37 EPA air toxics monitoring sites … including urban sites' in major industrial areas.*" (Sierra Club comments, p. 36)

FACT: The source of this data is a study from the Colorado School of Public Health, a study that was so flawed from the very beginning that it was decommissioned by officials in the county where the data were collected. Among its many problems: it inflated certain industry operations (and thus emissions levels) by

as much as 900 percent; used data that was known to be out of date when the study was released; and the data showing elevated benzene concentrations specifically were taken from a monitoring station closer to Interstate 70 than the control sample. The U.S. EPA, meanwhile, has observed that "most of the nation's benzene emissions come from mobile sources," and thus people who "live or work near major roads, or spend a large amount of time in vehicles, are likely to have higher exposures and higher risks."

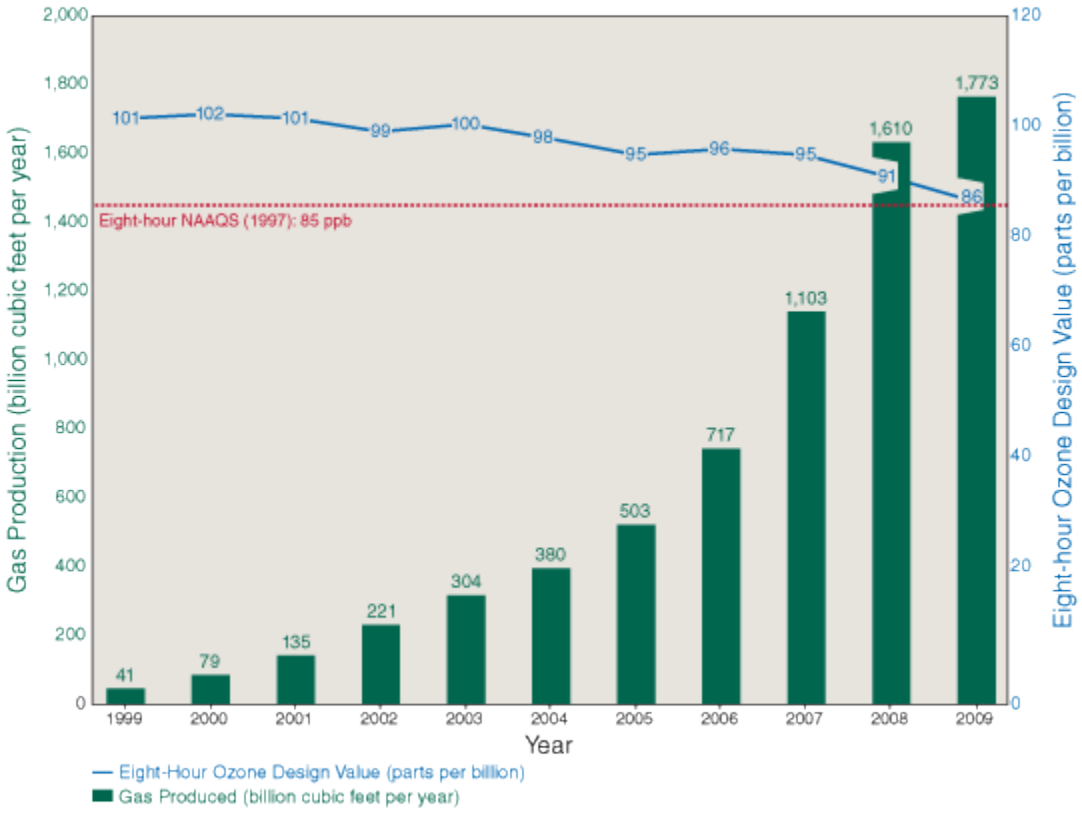
Sierra Club: "*Further, these emissions would not be spread uniformly around the country. Instead, they would be concentrated in and around gas fields. Those fields, like the Barnett field in Dallas Fort-Worth, or the Marcellus Shale near eastern cities, often are not far from (or are even directly within) major population centers. Residents of those cities will receive concentrated doses of air pollution, as will residents of the fields themselves.*" (Sierra Club comments, p. 36)

FACT: Extensive air monitoring and analysis by state regulatory officials in both the Barnett Shale region and the Marcellus Shale in Pennsylvania have found emissions levels do not pose a threat to human health.

As Chairman of the Texas Commission on Environmental Quality (TCEQ) Bryan Shaw has stated:

> "After several months of operation, state-of-the-art, 24-hour air monitors in the Barnett Shale area are showing no levels of concern for any chemicals. This reinforces our conclusion that there are no immediate health concerns from air quality in the area, and that when they are properly managed and maintained, oil and gas operations do not cause harmful excess air emissions."

In fact, as Barnett Shale production has increased substantially over the past decade, ozone levels in the Dallas-Fort Worth region have declined, according to TCEQ:



In a separate analysis of the Barnett Shale, which looked specifically at Denton County, public health experts found that "even as natural gas development expanded significantly in the area over the past several years, key indicators of health improved across every major category during those times."

Meanwhile, in northeast Pennsylvania, an air quality report by the state Department of Environmental Protection "did not identify concentrations of any compound that would likely trigger air-related health issues associated with Marcellus Shale drilling activities." DEP came to the same conclusion after examining shale activity in southwest Pennsylvania as well.

Sierra Club: "*The hundreds or thousands of wells required to support export will require millions of gallons of water to frack and will produce millions of gallons of wastewater. The extraction process will likewise increase the risk of contamination from surface spills and casing failures, as well as from the fracking process itself.*" (Sierra Club comments, p. 38)
Delaware Riverkeepers Network: *"Shale gas development presents an unparalleled level of harm to drinking water, air quality, food supplies, and public health that equates to high economic burdens for the United States economy and taxpayers."* (Riverkeepers comments, p. 3)

FACT: Casing failure rates, based on the data, are actually quite low. For example, a comprehensive report from the Ground Water Protection Council examined more than 34,000 wells drilled and completed in Ohio over a 25 year period, and the total number of incidents shows a failure rate of just 0.03 percent. Most of those incidents occurred in the 1980s and 1990s, too, before updated regulations took effect and prior to the implementation of current technologies. That same report looked at more than 187,000 wells in Texas, which had a casing failure rate of just 0.01 percent.

Meanwhile, federal officials, state regulators, and independent experts have also stated that shale development – including hydraulic fracturing – does not pose "substantial" risks.

- Interior Secretary Ken Salazar: Responding to what he deemed "hysteria" about hydraulic fracturing, Salazar said the process "can be done safely and has been done safely hundreds of thousands of times." (Feb. 2012)

- EPA Administrator Lisa Jackson: "In no case have we made a definitive determination that the [fracturing] process has caused chemicals to enter groundwater." (April 2012) Jackson also has said: "I'm not aware of any proven case where [hydraulic fracturing] itself has affected water." (May 2011)

- U.S. EPA: "EPA did not find confirmed evidence that drinking water wells have been contaminated by hydraulic fracturing fluid injection…" (2004)

- Former EPA Administrator Carol Browner: "There is no evidence that the hydraulic fracturing at issue has resulted in any contamination or endangerment of underground sources of drinking water." (May 1995)

- U.S. Dept. of Energy and Ground Water Protection Council: "[B]ased on over sixty years of practical application and a lack of evidence to the contrary, there is nothing to indicate that when coupled with appropriate well construction; the practice of hydraulic fracturing in deep formations endangers ground water. There is also a lack of demonstrated evidence that hydraulic

fracturing conducted in many shallower formations presents a substantial risk of endangerment to ground water." (May 2009)

- CardnoEntrix (Inglewood Oil Field Study): "Before-and-after monitoring of groundwater quality in monitor wells did not show impacts from high-volume hydraulic fracturing and high-rate gravel packing." (October 2012)

- Center for Rural Pennsylvania: "[S]tatistical analyses of post-drilling versus pre-drilling water chemistry did not suggest major influences from gas well drilling or hydrofracturing (fracking) on nearby water wells…" (Oct. 2011)

- John Hanger, Former Pa. DEP Secretary: "We've never had one case of fracking fluid going down the gas well and coming back up and contaminating someone's water well." (2012)

- Dr. Stephen Holditch, Department of Petroleum Engineering, Texas A&M University; member of Natural Gas Subcommittee of the Secretary of Energy Advisory Board: "I have been working in hydraulic fracturing for 40+ years and there is absolutely no evidence hydraulic fractures can grow from miles below the surface to the fresh water aquifers." (October 2011)

- Dr. Mark Zoback, Professor of Geophysics, Stanford University: "Fracturing fluids have not contaminated any water supply and with that much distance to an aquifer, it is very unlikely they could." (August 2011)

Sierra Club: "*The impacts of withdrawing this water – especially in arid regions of the west – are large, and can greatly change the demand upon local water systems. The Environment America report notes that fracking is expected to comprise 40% of water consumption in one county in the Eagle Ford shale region of Texas, for example. As fracking expands, and operators seek to secure water rights to divert water from other uses, these withdrawal costs will also rise*." (Sierra Club comments, p. 41)

FACT: Data from Texas, Colorado, and the U.S. Department of Energy show relative water use from oil and natural gas activity – including but not necessarily limited to hydraulic fracturing – is actually quite small.

In Colorado, for example, agriculture is the largest source of water, comprising approximately 85 percent of the state's total water demand. Hydraulic fracturing, however, accounts for less than one-tenth of one percent.

In Texas – the largest oil and natural gas producing state in the country – the water required for hydraulic fracturing every year is about 23 percent less than what the city of Austin alone consumes annually, according to a recent study (Texas rice farmers, by comparison, use about three times more water every year than does the city of Austin). The author of that study, Jean-Philippe Nicot, said of his results: "the water used for fracking is not a threat for aquifers." The Tarrant Regional Water District, which supplies water for approximately 1.7 million people in north Texas, says the water it supplied for oil and gas drilling operations in 2011 amounted to just 0.54 percent of the total volume it sold that year.

In New York, regulators have estimated that water required for hydraulic fracturing will amount to about one quarter of one percent – 0.24 percent – of the state's total water demand.

According to a report for the U.S. Department of Energy, the water required for hydraulic fracturing in any given region would amount to roughly 0.8 percent of total demand.

Finally, a new study from Duke University found that developing natural gas from shale actually results in about 35 percent less wastewater than so-called conventional wells, on a per-unit-of-energy-produced basis.

Sierra Club: "*One recent study concluded, on the basis of geologic modeling, that frack fluid may migrate from the hydraulic fracture zone to freshwater aquifers in less than ten years*." (Sierra Club comments, p. 43)

FACT: The study cited by the Sierra Club was full of errors "from start to finish," according to Don Siegel, a hydrogeologist at Syracuse University and a professor of civil and environmental engineering. Indeed, as the Sierra Club even admits, the basis was a computer model that theorized an event – hydraulic fracturing fluid migrating a mile or more upward through billions of tons of impermeable rock and into drinking water supplies – that is based on absolutely zero empirical evidence.

Dr. Siegel observed that Myers' computer model "cannot calculate proper water flow conditions," because he assumes the geology overlying the Marcellus Shale is predominantly sandstone. But the reality is that 90 percent of the rock layers above the Marcellus Shale are also shales, which are significantly less permeable to fluid movement than sandstones. In essence, Myers' computer model examined a geologic scenario that simply does not exist.

This study, cited by the Sierra Club as if it were a reasonable assessment of risk, is actually "not grounded in either science or experience," according to Dr. Siegel.

Sierra Club: "*One study 'documented the higher concentration of methane originating in shale gas deposits . . . into wells surrounding a producing shale production site in northern Pennsylvania.' By tracking certain isotopes of methane, this study – which the DOE Subcommittee referred to as 'a recent, credible, peer-reviewed study' determined that the methane originated in the shale deposit, rather than from a shallower source*." (Sierra Club comments, p. 43)

FACT: The Sierra Club is once again relying on a widely discredited study. In addition, the person who selected the outside reviewers for the study – William H. Schlesinger – sits on the Board of Trustees of the anti-hydraulic fracturing NRDC. Shortly after release of the report, two of the authors of the study wrote an op-ed in the *Philadelphia Inquirer* in which they declared, "we would like to see shale gas become largely unnecessary."

Among the problems with the study (or, perhaps, the way it was interpreted by groups like the Sierra Club) is that the thermogenic methane – which is what supposedly links deep shale exploration with contamination – was actually found in nearly every well the researchers sampled, even in areas with no natural gas development. The authors of the study, however, fail to explain why that may be the case, even while hypothesizing a direct link between shale development and thermogenic methane in water wells.

The National Academy of Sciences, meanwhile, published two separate letters in response to this study, which declared there was a "lack of data" to support the researchers' conclusions, and that hydraulic fracturing was "not responsible" for the observed methane in water wells. The head of the Pennsylvania Department of Environmental Protection said the study was "biased science from biased researchers."

Sierra Club: *The Club cites EPA' study on water quality in Pavillion, Wyo., before observing: "The U.S. Geological Survey, in cooperation with the Wyoming Department of Environmental Quality, also provided data regarding chemicals found in wells surrounding Pavillion. Although the USGS did not provide analysis regarding the likely source of the contaminants found, an independent expert who reviewed the USGS and EPA data at the request of Sierra Club and other environmental groups concluded that the USGS data supports EPA's findings*." (Sierra Club comments, p. 44)

FACT: The U.S. Geological Survey's findings actually cast more doubt on the EPA's research in Pavillion, which already suffered from fatal flaws.

As Energy In Depth has highlighted, data collected by the USGS differed from the EPA's findings in at least 50 individual measurements. In fact, one of the monitoring wells (MW02) that EPA had used was so poorly constructed that the USGS refused to take samples from it, effectively disqualifying a significant portion of the EPA's findings.

Meanwhile, Don Simpson of the Bureau of Land Management suggested in March 2012 that "bias" could have been introduced in EPA's findings, and that those findings

> "…should not be prematurely used as a line of evidence that supports EPA's suggestion that gas has migrated into the shallow subsurface due to hydraulic fracturing or improper well completion until more data is collected and analyzed…"

It's also worth noting that the "independent expert" whom the Sierra Club asked to review the EPA and USGS findings was actually funded by the Park Foundation – the same entity that funded Josh Fox's film *Gasland* and numerous other studies intended to link hydraulic fracturing to environmental harm. The Foundation's president has even said: "In our work to oppose fracking, the Park Foundation has simply helped to fuel an army of courageous individuals and NGOs."

Environmental Working Group: *"EWG also has growing concerns about the potential for the underground injection of drilling wastewater to induce seismicity, as scientists and regulators study the link between such activity and numerous recent earthquakes in Arkansas and Ohio."* (EWG comments, p. 3)

FACT: Recent stories reporting on seismic activity in Ohio (as well as a USGS report suggesting some recent earthquake trends are man-made) have been mischaracterized by the media as being directly linked to hydraulic fracturing. According to the scientists themselves, that's actually not true at all.

According to USGS scientist Bill Ellsworth,"We find no evidence that [hydraulic fracturing] is related to the occurrence of earthquakes that people are feeling. We think that it's more intimately connected to the wastewater disposal." Ellsworth has also criticized the media's role in misrepresenting his work: "I was greatly surprised to see how words were being used in the press in ways that were inappropriate … We don't see any connection between fracking and earthquakes of any concern to society."

The link between injection wells and seismicity has been understood for decades, according to the U.S. Department of the Interior. In the 1960s, a series of small earthquakes around Denver were linked to disposal wells receiving wastewater from a nearby chemical plant. USGS has also noted that where these isolated incidents have occurred, it is easily manageable and making simple changes (i.e. reducing flow rates) safely mitigates any discernible risk.

Sierra Club: "*Gas extraction is a major industrial activity inconsistent with essentially all home mortgage policies. Accordingly, signing a gas lease without the consent of the lender may cause an immediate mortgage default, leading to foreclosure*." (Sierra Club comments, p. 50)
Environmental Working Group: "*Properties subject to gas drilling leases can lose significant resale value, as the typical lease allows drillers to engage in dangerous activities and use and store hazardous substances on a landowner's property."* (EWG comments, p. 2)

FACT: The claim that shale development drives down home values and is bad news for homeowners is a well-known one. It also is a widely discredited one.

For example, Weld County, Co., has more oil and gas wells – 19,000 – than any other county in the country. If there were a direct link between oil and gas development and harm to homeowners, then we'd certainly see it there. But last year, median home prices actually rose by 12 percent in Weld County, a full point higher than the value increase in the Denver metropolitan area.

John Spall, a real estate attorney in northeast Pennsylvania – where a significant amount of Marcellus Shale activity is occurring – has said, "I don't know of any lenders who are refusing mortgages in those areas of Pennsylvania where natural gas development is taking place." He added that, in his experience, a "gas lease bonus payment enabled a lot of our customers to resolve mortgage issues and pay off many of them."

Numerous realtors, meanwhile, have stated that property values have increased since natural gas development began in their area of expertise, making previously unsellable properties worth listing.

Sierra Club: "*Associated infrastructure such as roads and corridors will likewise remain disturbed. Because these disturbances involve clearing and grading of the land, directly disturbed land is no longer suitable as habitat*." (Sierra Club comments, p. 51)

FACT: Oil and gas companies pay for road improvements and upkeep, sometimes paying more for public roads than the government itself. Additionally, after the well is completed, the land is reclaimed and largely restored.

For example, between spring and the end of summer in 2010, Chesapeake Energy invested $15 million in road upgrades and repairs in just a four-county region of northeast Pennsylvania. Anadarko Petroleum Corp., meanwhile, spent $1.3 million to upgrade a stretch of road near Haneyville.

Since 2010, Chesapeake has invested more than $300 million to upgrade, improve, or repair some 450 miles of road infrastructure in Pennsylvania.

III. Conclusion

IPAA and EID submit that America's natural gas industry has the resources and technology to safely and reliably provide natural gas supplies for consumers, both in the United States and abroad. IPAA and EID urge DOE to consider the initial comments within the stated scope of this inquiry. Many of the comments

submitted by environmental groups should be dismissed. To the extent such non-germane comments are considered, the above reply comments should prove them without merit.

Respectfully submitted,

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