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December 11, 2015

Gina McCarthy
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington. D.C. 20460

Dear Administrator McCarthy:

This letter is being sent on behalf of the Independent Petroleum Association of America (IPAA), as well as several of its national, regional and state cooperating associations. A full listing of those organizations can be found at the conclusion of this letter.

As the Environmental Protection Agency's (EPA) Science Advisory Board (SAB) prepares its comments on the agency's five year study, "Assessment of the Potential Impacts of Hydraulic Fracturing for Oil and Gas on Drinking Water Resources,"[1] we would like to address the effort currently underway to pressure EPA into reversing its finding, namely that "hydraulic fracturing activities have not led to widespread, systemic impacts to drinking water resources."

The conclusion of no widespread, systemic impacts appropriately describes EPA's findings, which show that while oil and natural gas development (or indeed any kind of energy development) is certainly not risk free, the risk of water contamination is not pervasive. Indeed, EPA's report counters the notion that hydraulic fracturing poses an inherent threat to underground sources of drinking water (USDW).

We are concerned, however, that the SAB may be considering a revision to its finding, based not on science, but rather pressure from special interest groups. According to a recent report from *E&E News*, Dr. David Dzomback, who chairs the SAB, was quoted as saying: "There's agreement the sentence needs to be modified," referring to the scientific conclusion that hydraulic fracturing activities "have not led to widespread, systemic impacts to drinking water resources." Dr. Dzomback added that he believes the sentence now may be "ambiguous and requires clarification."[2]

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[1] Environmental Protection Agency, *Assessment of the Potential Impacts of Hydraulic Fracturing for Oil and Gas on Drinking Water Resources*, June 2015: http://cfpub.epa.gov/ncea/hfstudy/recordisplay.cfm?deid=244651

[2] Mike Soraghan, "EPA finding of no 'widespread, systemic' problems under fire," *E&E News*, Nov. 4, 2015: http://www.eenews.net/stories/1060027402

To be clear, there is nothing ambiguous about EPA's finding. The terms "widespread" and "systemic" are clearly defined and unequivocal. EPA even offers more clarity, noting that while there were some instances of water impacts (not from the process of hydraulic fracturing itself, but from related activities, such as well casing failures or fluid spills on the surface), the number of these instances "was small compared to the number of hydraulically fractured wells."

We recognize that several critics of U.S. oil and natural gas production, who have waged a years-long campaign to ban or restrict the use of hydraulic fracturing, have publicly pressured EPA and the SAB into revising its finding. But we must remind you that the SAB is a scientific body, and thus its conclusions should be based on science; they should not be subject to political pressure from environmental groups who simply disagreed with what the EPA's five-year study found.

Importantly, EPA's draft report is very much in line with the scientific consensus on hydraulic fracturing. Numerous peer-reviewed studies have shown that the process poses an exceedingly low risk of impacting drinking water sources. Here are a few that stand out:

- **Drollette et al., Proceedings of the National Academy of Sciences (2015)**: This study found no indication of contamination from the fracking process itself. As the researchers explain, "*We found no evidence for direct communication with shallow drinking water wells due to upward migration form shale horizons*."[3]

- **Jackson et al., Environmental Science and Technology (2015)**: The researchers of this study found no evidence of hydraulic fracturing contaminating water. According the report's press release, "Using innovative techniques such as isotopic 'tracer' compounds that distinguish the source of chemicals in well water, Jackson *has not found evidence that frack water contaminants seep upward to drinking-water aquifers* from deep underground."[4]

- **California Council on Science and Technology and Lawrence Berkeley National Laboratory (2015)**: This peer-reviewed independent study concluded: *"We found no documented instances of hydraulic fracturing or acid stimulations directly causing groundwater contamination in California."*[5]

- **Siegel et al., Environmental Science and Technology (2015)**: This peer-reviewed study by researchers at Syracuse University looks at thousands of randomly selected baseline samples from water wells throughout Pennsylvania and concludes: "there is *no*

[3] Drollette et al., "Elevated levels of diesel range organic compounds in groundwater near Marcellus gas operations are derived from surface activities," *Proceedings of the National Academy of Sciences*, June 2015: http://www.pnas.org/content/112/43/13184.abstract

[4] Jackson et al., "The Depths of Hydraulic Fracturing and Accompanying Water Use Across the United States," *Environmental Science and Technology*, July 21, 2015: http://pubs.acs.org/doi/abs/10.1021/acs.est.5b01228?journalCode=esthag

[5] California Council on Science and Technology and Lawrence Berkeley National Laboratory*, An Independent Scientific Assessment of Well Stimulation in California, Volume II: Potential Environmental Impacts of Hydraulic Fracturing and Acid Stimulations*, July 2015: http://ccst.us/publications/2015/2015SB4-v2.pdf

significant correlation between dissolved methane concentrations in groundwater and proximity to nearby oil/gas wells."[6]

- **U.S. Department of Energy's National Energy Technology Laboratory (NETL) (2014)**: In this study, which the Associated Press called a "landmark study," NETL researchers injected tracers into the hydraulic fracturing fluid in a well in Greene County, Pennsylvania to track for any signs of possible migration. After twelve months of monitoring, the researchers found no signs of this happening. Here's what the report concluded: "Current findings are: 1) *no evidence of gas migration* from the Marcellus Shale; and 2) *no evidence of brine migration* from the Marcellus Shale."[7]

- **Kresse et al., U.S. Geological Survey (USGS) Scientific Investigations Report (2013):** This USGS study examined the water quality of 127 shallow domestic wells in the Fayetteville Shale and found no evidence of contamination: "*This new study is important in terms of finding no significant effects on groundwater quality from shale gas development within the area of sampling*."[8]

- **Flewelling et al., Groundwater and Geophysical Research Letters (2013)**: Researchers at Gradient released two peer-reviewed studies finding no impacts from shale development. The first study explained that "*Overall, the rapid upward migration scenarios that have been recently suggested* (Rozell and Reaven 2012; Myers 2012; Warner et al. 2012) *are not physically plausible.*" In a second paper, Gradient's team found, "*It is not physically plausible for induced fractures to create a hydraulic connection between deep black shale and other tight formations to overlying potable aquifers, based on the limited amount of height growth at depth and the rotation of the least principal stress to the vertical direction at shallow depths*."[9]

- **Molofsky et al., Groundwater (2013)**: This study tested 1,701 water wells in northeastern Pennsylvania and found that "*methane is ubiquitous in groundwater*

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[6] Siegel et al, "Methane Concentrations in Water Wells Unrelated to Proximity to Existing Oil and Gas Wells in Northeastern Pennsylvania," Environmental Science and Technology, March 12, 2015: http://pubs.acs.org/doi/abs/10.1021/es505775c

[7] U.S. Department of Energy's National Energy Technology Laboratory, "An Evaluation of Fracture Growth and Gas/Fluid Migration as Horizontal Marcellus Shale Gas Wells are Hydraulically Fractured in Greene County, Pennsylvania," September 15, 2014: http://www.netl.doe.gov/File%20Library/Research/onsite%20research/publications/NETL-TRS-3-2014_Greene-County-Site_20140915_1_1.pdf

[8] Kresse et al., "Shallow Groundwater Quality and Geochemistry in the Fayetteville Shale Gas-Production Area, North-Central Arkansas, 2011," U.S. Geological Survey (USGS) Scientific Investigations Report, January 10, 2013: http://pubs.usgs.gov/sir/2012/5273/

[9] Flewelling et al., "Constraints on Upward Migration of Hydraulic Fracturing Fluid and Brine," *Groundwater*, July 29, 2013: http://onlinelibrary.wiley.com/doi/10.1111/gwat.12095/full and Flewelling et al., "Hydraulic fracture height limits and fault interactions in tight oil and gas formations," *Geophysical Research Letters*, July 26, 2013: http://onlinelibrary.wiley.com/doi/10.1002/grl.50707/pdf

indicating that, on a regional scale, methane concentrations are not correlated to shale-gas extraction."[10]

- **U.S. Govt. Accountability Office (2012)**: The U.S. GAO consulted regulatory officials in eight states who explained, based on their own state investigations, that "*the hydraulic* fracturing process *has not been identified as a cause of groundwater contamination* within their states."[11]

- **Cardno Entrix (2012)**: This study, focusing on water wells in the Inglewood, Calif., oil field concluded, "*Before-and-after monitoring of groundwater quality in monitor wells did not show impacts from high-volume hydraulic fracturing and high-rate gravel packing*."[12]

- **Massachusetts Institute of Technology Energy Initiative (2010)**: This study concludes, "[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."[13]

Below, we will address some of the questionable claims that activists and some members of the SAB have made publicly about EPA's draft report.

Claim: *"The actual text of the thousand-page study is a testament to how, at every turn, EPA's efforts to evaluate the 'frequency and severity' of the impacts of fracking on drinking water resources were thwarted by significant 'data limitations and uncertainties.'"* — Food & Water Watch, November 23, 2015[14]

FACT: EPA's study, which took five years to complete, is by far the most thorough report ever to be done regarding potential groundwater impacts from hydraulic fracturing. As EPA's Thomas Burke said in a press release,

> "It is the *most complete compilation of scientific data to date*, including over 950 sources of information, published papers, numerous technical reports, information from stakeholders and peer-reviewed EPA scientific reports."[15]

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[10] Molofsky et al., "Evaluation of Methane Sources in Groundwater in Northeastern Pennsylvania," *Groundwater*, July 2013: http://onlinelibrary.wiley.com/doi/10.1111/gwat.12056/pdf

[11] U.S. Government Accountability Office, "Information on Shale Resources, Development, and Environmental and Public Health Risks," September 2012: http://www.gao.gov/assets/650/647791.pdf

[12] Cardo Entrix, "Hydraulic Fracturing Study PXP Inglewood Oil Field," October 10, 2012: http://www.inglewoodoilfield.com/res/docs/102012study/Hydraulic%20Fracturing%20Study%20Inglewood%20Field10102012.pdf

[13] Massachusetts Institute of Technology Energy Initiative, The Future of Natural Gas: An Interdisciplinary MIT Study, 2010: http://web.mit.edu/ceepr/www/publications/Natural_Gas_Study.pdf

[14] Hugh MacMillan, "Advisory Panel Boxes in Obama EPA on Fracking Study," Food & Water Watch, November 23, 2015: https://www.foodandwaterwatch.org/insight/advisory-panel-boxes-obama-epa-fracking-study

[15] EPA, "EPA Releases Draft Assessment on the Potential Impacts to Drinking Water Resources from Hydraulic Fracturing Activities," June 4, 2015: http://yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/b542d827055a839585257e5a005a796b!OpenDocument

The study text itself explains the sheer breadth of the research that was conducted:

> "The EPA used a broad search strategy to identify approximately 3,700 sources of scientific information that could be applicable to this assessment. This search strategy included both requesting input from scientists, stakeholders, and the public about relevant data and information, and thorough searching of published information and applicable data." (1-6 to 7)

Claim: As *E&E News* recently reported, the SAB panel is "*also recommending that the study include more about three major EPA investigations into water contamination near drilling sites that were scuttled by EPA higher-ups*."[16]

FACT: These three cases — which occurred in Pavillion, Wyo.; Dimock, Pa.; and Parker County, Tex. — were already investigated by the EPA, and the theories about groundwater pollution from hydraulic fracturing have long been put to rest. In each case, regulators and scientists have determined that shale development was not the cause of water contamination.

The case in Pavillion (where poor water quality has been documented since the 1960s[17]) hinged on a single draft EPA report from December 2011, which theorized a link between hydraulic fracturing and water contamination. But EPA's work was widely criticized by state and federal officials. In fact, in subsequent testing, the USGS had more than 50 separate measurements that differed from EPA's results. USGS also effectively disqualified one of only two monitoring wells used by EPA, due to low flow rates and poor construction.[18] Further, Don Simpson, then-state director for the U.S. Bureau of Land Management (BLM), suggested EPA's testing could have introduced "bias in the samples," adding that the data "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."[19]

In the case in Dimock, the Pennsylvania Department of Environmental Protection (DEP) investigated whether oil and natural gas activity was responsible for contamination. To resolve the issue, the DEP ultimately issued a consent decree with the operator, and the agency determined in November 2011 that the operator had fulfilled its obligations under that order. The U.S. EPA agreed in late 2011 "The data does not indicate that the well water presents an immediate health threat to users."[20] Nonetheless, even with no new data in the case, EPA reversed course shortly thereafter and began a high-profile investigation that attracted significant attention from the news media. The EPA ultimately released four sets of sampling

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[16] Mike Soraghan, "EPA finding of no 'widespread, systemic' problems under fire," *Energywire*, November 4, 2015: http://www.eenews.net/stories/1060027402

[17] Plafcan et al., Water Resources of Fremont County, Wyoming, U.S. Geological Survey, 1995: http://pubs.usgs.gov/wri/1995/4095/report.pdf

[18] A full assessment of USGS's findings can be found on the Energy In Depth blog: "Enormous Differences between USGS and EPA on Pavillion," Oct. 3, 2012: http://energyindepth.org/mtn-states/enormous-differences-between-epas-pavillion-data-and-usgss/

[19] Donald Simpson, Letter to James Martin, EPA Region 8 Administrator, March 1, 2012: http://energyindepth.org/wp-content/uploads/2012/10/BLM-Pavillion-comments.pdf

[20] Taylor Trish, EPA Community Involvement Coordinator, Email to Dimock Residents, November 10, 2011: http://energyindepth.org/wp-content/uploads/marcellus/2011/12/EPA-message.pdf

data, and concluded in July 2012 that "there are not levels of contaminants present that would require additional action by the Agency."[21]

The Parker County case made news on December 7, 2010, when then-EPA Region 6 administrator Al Armendariz issued an unprecedented "endangerment order" against Range Resources, alleging that its gas drilling operations had caused methane to enter groundwater. But even before EPA's press release went out, emails show that Armendariz tipped off the activists about the order telling them, "We're about to make a lot of news" and "time to Tivo channel 8."[22] The case had been brought to EPA after video surfaced of a landowner igniting water coming out of a garden hose. However, a district judge later ruled in early 2012 that a consultant named Alisa Rich had convinced the property owner to hook a garden hose up to a gas vent – not the water line – "to provide local and national news media a deceptive video, calculated to alarm the public into believing the water was burning." The judge also noted: "This demonstration was not done for scientific study."[23] Rich had advised the property owner to do this because "it is worth every penny if we can get jurisdiction to EPA."[24] Subsequent scientific testing through nitrogen fingerprinting, however, proved that the methane was naturally-occurring (from the shallow Strawn Formation, not the Barnett Shale), and multiple state investigations determined gas drilling was not to blame. A few weeks later, Armendariz was forced to resign after video surfaced of him bragging that his method of regulating the oil and gas industry was similar to how the Romans used to "crucify" villagers. With a mountain of scientific evidence showing EPA's order to be baseless, the EPA withdrew the order in the spring of 2012.

Further, the Railroad Commission of Texas concluded in 2014,

> "The occurrence of natural gas in the complainants' water wells may be attributed to natural migration of gas from the shallow Strawn Formation, exacerbated by water well construction practices whereby *some water wells have penetrated 'red beds' in the transition interval between the aquifer and the Strawn Formation*. Contribution of natural gas to the aquifer by the nearby Barnett Shale gas production wells is *not indicated by the physical evidence*…" (p. 11; emphasis added)[25]

Claim: *"[T]he agency has narrowed the scope of the study and the data available, as a result of industry influence."* – Natural Resources Defense Council (NRDC), March 11, 2015[26]

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[21] U.S. EPA, "EPA Completes Drinking Water Sampling in Dimock, Pa.," July 25, 2012: http://yosemite.epa.gov/opa/admpress.nsf/0/1A6E49D193E1007585257A46005B61AD

[22] Al Armendariz, EPA Region 6 Administrator, Email to activist groups, December 7, 2010: http://www.eenews.net/assets/2011/02/11/document_gw_03.pdf

[23] Jack Z. Smith, "Owner of contaminated water well in Parker County loses in court," Star-Telegram, February 17, 2012: http://www.star-telegram.com/living/family/moms/article3830407.html

[24] Alisa Rich, Email to Steve Lipsky, August 12, 2010: http://www.eenews.net/assets/2011/02/11/document_gw_04.pdf

[25] Railroad Commission of Texas, "Water Well Complaint Investigation Report: Silverado on the Brazos Neighborhood, Parker County, Texas," May 23, 2014. Accessed via Energy In Depth: http://energyindepth.org/wp-content/uploads/2014/05/texas-rrc-report-parker-county.pdf

[26] Briana Mordick, What Should We Expect from EPA's Study on Fracking and Drinking Water?, Natural Resources Defense Council Switchboard Blog, March 11, 2015: http://switchboard.nrdc.org/blogs/bmordick/what_should_we_expect_from_epa.html

FACT: At environmental groups' requests, the EPA *greatly expanded* the definition of "hydraulic fracturing" to include all the processes associated with oil and gas development, such as water acquisition, chemical mixing, well injection, flowback, produced water and wastewater treatment and disposal.

In other words, EPA's finding of hydraulic fracturing having no "widespread, systemic" impacts on drinking water was based on an expanded definition of "hydraulic fracturing" to include processes other than fracturing itself.

EPA also significantly expanded the definition for what constitutes "drinking water." As the report explains,

> "Drinking water resources are defined within this report as any body of ground water or surface water that now serves, or in the future could serve, as a source of drinking water for public or private use. **This is broader than most federal and state regulatory definitions of drinking water and encompasses both fresh and non-fresh bodies of water**." (ES-3; emphasis added)

As this quote demonstrates, EPA openly acknowledges that this definition is "broader than most federal and state regulatory definitions." Even while using highly expanded definitions of "hydraulic fracturing" and "drinking water," EPA still concluded that impacts were not widespread or systemic.

Conclusion

Hydraulic fracturing has been extensively studied since its first commercial application in the 1940s, not only in EPA's five year comprehensive study, but also in numerous studies by other prestigious institutions. In fact, in 2004, EPA published a separate comprehensive assessment of potential groundwater impacts from hydraulic fracturing. Here is what the EPA concluded[27] in 2004:

> "Based on the information collected and reviewed, EPA has concluded that the injection of hydraulic fracturing fluids into CBM [coalbed methane] wells **poses little or no threat to USDWs** and does not justify additional study at this time." (p. ES-1; emphasis added)

To avoid any doubt about what the EPA has concluded in its previous research, former EPA administrator Lisa Jackson acknowledged in May of 2011[28] that she was "not aware of any proven case where fracking itself has affected water." One year later, Ms. Jackson told the press: "In no case have we made a definitive determination that the fracking process has caused chemicals to enter groundwater."[29]

EPA's findings in its 2015 draft report mirror what the agency has previously found, and its conclusion that there is no evidence of widespread contamination from hydraulic fracturing aligns with what scientists have repeatedly found in peer-reviewed research.

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[27] U.S. EPA, "Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs," June 2004: http://nepis.epa.gov/Adobe/PDF/P100A99N.PDF

[28] "EPA Administrator Lisa Jackson Tells Congress 'No Proven Cases Where Fracking Has Affected Water'," May 24, 2011. Accessed via YouTube: https://www.youtube.com/watch?v=L4RLzlcox5c

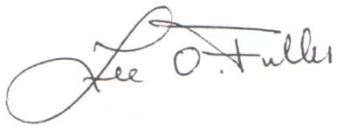
[29] "EPA's Lisa Jackson on safe hydraulic fracturing," April 30, 2012. Accessed via YouTube: https://www.youtube.com/watch?v=_tBUTHB_7Cs

If there were anything to suggest widespread or systemic impacts to drinking water as a result of hydraulic fracturing, such evidence would have been uncovered during the past decade of extensive study of the process, including the EPA's latest comprehensive report. The lack of such evidence means the SAB's conclusion is scientifically unsound.

According to the EPA, a "key priority" for the Agency is to "base Agency actions on sound scientific data, analysis, and interpretations." The SAB specifically is authorized to "review the quality and relevance of the scientific and technical information being used by the EPA or proposed as the basis for Agency regulations."

There is nothing in the draft report from a "scientific and technical" standpoint that suggests EPA's finding of no "widespread, systemic" groundwater impacts from hydraulic fracturing is incorrect. As a result, we urge the SAB to maintain its role as a scientific body by rejecting calls to change its scientific findings, which are based on political campaigns, not scientific analyses or technical reviews.

Sincerely,



Lee Fuller
Executive Vice President

Along with IPAA, the following organizations are jointly signing this letter: American Association of Professional Landmen, (AAPL), Association of Energy Service Companies (AESC), International Association of Drilling Contractors (IADC), International Association of Geophysical Contractors (IAGC), National Stripper Well Association (NSWA), Petroleum Equipment & Services Association (PESA) and the following organizations:

Arkansas Independent Producers and Royalty Owners Association
California Independent Petroleum Association
Coalbed Methane Association of Alabama
Colorado Oil & Gas Association
East Texas Producers & Royalty Owners Association
Eastern Kansas Oil & Gas Association
Florida Independent Petroleum Association
Idaho Petroleum Council
Illinois Oil & Gas Association
Independent Oil & Gas Association of New York
Independent Oil & Gas Association of West Virginia
Independent Oil Producers' Agency
Independent Oil Producers Association Tri-State
Independent Petroleum Association of New Mexico
Indiana Oil & Gas Association
Kansas Independent Oil & Gas Association
Kentucky Oil & Gas Association
Louisiana Oil & Gas Association
Michigan Oil & Gas Association
Mississippi Independent Producers & Royalty Association

Montana Petroleum Association
National Association of Royalty Owners
Nebraska Independent Oil & Gas Association
New Mexico Oil & Gas Association
New York State Oil Producers Association
North Dakota Petroleum Council
Northern Montana Oil and Gas Association
Ohio Oil & Gas Association
Oklahoma Independent Petroleum Association
Panhandle Producers & Royalty Owners Association
Pennsylvania Independent Oil & Gas Association
Permian Basin Petroleum Association
Petroleum Association of Wyoming
Southeastern Ohio Oil & Gas Association
Tennessee Oil & Gas Association
Texas Alliance of Energy Producers
Texas Oil and Gas Association
Texas Independent Producers and Royalty Owners Association
Utah Petroleum Association
Virginia Oil and Gas Association
West Slope Colorado Oil & Gas Association
Western Energy Alliance
West Virginia Oil and Natural Gas Association