

Hydraulic Fracturing EPA Public Informational Meeting

Binghamton, New York

September 13, 2010 – Evening Session

Summary of Public Comments

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Meeting Format

US EPA (hereafter referred to as EPA) held four public informational meetings in Binghamton, New York, on September 13 and 15, 2010, to discuss proposed design and scope of a research study on the potential relationship between hydraulic fracturing used in natural gas extraction and drinking water. The following meeting summary details the public verbal comments given during the second of the four meetings held on September 13, 2010, from 6:00 to 10:00 p.m.

The meeting began with brief presentations by EPA staff on the need for the study, proposed scope and design of the study, and public participation opportunities during study development. Over 370 individuals attended the meeting and EPA received verbal comments from 102 citizens following the EPA presentations. Both the EPA presentations and public comments are summarized in this document.

Summary of EPA Presentations

EPA made brief presentations on the need for a study, the proposed study design, and the stakeholder process used for the planning stages of the study.

Introductory Remarks

Judith Enck, Regional Administrator, EPA Region 2

- EPA Region 2 serves New York, New Jersey, US Virgin Islands, Puerto Rico, and the tribal nations located therein.
- Natural gas is a key element of the nation's energy future. However, the public has expressed serious questions on the safety of hydraulic fracturing (HF) and EPA takes these questions seriously.
- Many have expressed concern over the safety of HF and its potential impact on drinking water supplies. To address these concerns, EPA will conduct a study investigating the potential impacts of HF on public health and the environment, particularly drinking water.
- The study will be transparent and peer-reviewed, and will emphasize stakeholder input. At today's meeting, EPA asks for public comment on the study's design, scope, and focus. EPA wants to hear the public's experiences and ideas.
- EPA places a high priority on this study and hopes that the public's concerns will be addressed and answered through this study.
- It is EPA's understanding that the New York Department of Environmental Conservation (NYDEC) will not review or take action on the 60 permit applications they have received until the after the release of the final Supplemental Generic Environmental Impact Statement (SGEIS). NYDEC has received approximately 14,000 public comments on the draft SGEIS.

Why Are We Studying Hydraulic Fracturing?

Jeanne Briskin, Office of Science Policy, EPA Office of Research and Development

- Natural gas is an important part of our energy future, and it is a resource we value for a variety of reasons, but the public has raised concerns about the impacts of HF. EPA takes these concerns seriously and wants to ensure that public health and the environment are protected.
- Congress directed EPA to conduct a study focused on HF's possible impacts on drinking water.
- The study will proceed as quickly as possible while respecting the scientific process and involving experts and stakeholders. EPA insists on conducting a credible, transparent, scientific study, which takes time.
- The study will use the best available science, independent sources of information, and a transparent, peer-reviewed process. EPA will consult with other groups, including non-governmental organizations (NGOs), industry, states, and federal partners.
- EPA is also in the process of putting together a robust panel of experts with a wide range of experience. The panel will provide a critical review of the study plan.
- The study itself will be led by EPA scientists and headed by Dr. Bob Puls. EPA's Science Advisory Board (SAB) reviewed an initial scoping study plan in April 2010. The SAB recommended that the study focus on water resources (including quality and quantity), use a case study approach, and include input from stakeholders.
- The expected study timeline is as follows:
 - October 2010: peer review of study plan.
 - Early 2011: begin study.
 - Late 2012: initial results.
- EPA expects that work will continue into the future. This is a complicated issue to study, but EPA will make every effort to complete the study as expeditiously as possible. If the study identifies issues that require urgent attention, EPA will act quickly to take the necessary steps.

What Will the Study Include?

Dr. Robert Puls, Director of Research, EPA Ground Water and Ecosystems Restoration Division

- EPA is very impressed with the depth of knowledge of New York's citizens on this topic. The comments and suggestions received at these public meetings will be very helpful to EPA.
- We need to find a balance between moving forward with natural gas exploration and extraction and protecting our natural resources.
- Here are the primary questions we hope to address with the study:
 - What HF scenarios might cause impacts on drinking water resources?
 - What approaches are effective for protecting drinking water?
- The major elements of the study are data and information (both quantitative and qualitative), chemical fate and transport (including the identification of chemicals that are used), and case studies (located in areas where issues have already arisen and/or on the site of new HF projects).

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- The study could also include regional data collected by other entities, such as the Bureau of Land Management (BLM), the U.S. Geological Survey (USGS), and the Army Corps of Engineers.
- In a typical HF operation, there is a production well that is fairly deep, and there are several geologic strata between the fractures and the drinking water resources. However, there are cases where HF is shallower, and, in the past, there have been cases where HF has taken place within a geologic unit that is classified as an underground source of drinking water (USDW).
 - There can be 10 to 20 wells located on one well pad. Five million gallons of water can be required to fracture a single well.
 - Fractures in the geologic formations are created by HF, or they exist naturally in the formation. There can be interconnections between natural and induced fractures.
 - The distance between drinking water sources and HF provides one level of protection. Additional protection is provided by the casing and cementing of the well itself.
 - When wells are fractured, water, fracturing chemicals, and a proppant (such as sand) are injected under high pressure. This creates and props open fractures. When the pressure is released, the fluid returns to the surface.
 - In the West, wastewater is often disposed of through permanent underground injection wells. However, there are fewer of those wells in the East, which adds an additional challenge.
- Types of data and information needed include:
 - Pre- and post-drilling site characteristics and water quality.
 - Chemical data, including information on HF fluids.
 - Water use data, such as sources and amounts.
 - Well construction and well integrity information.
 - Information on operation and management practices, especially with respect to produced water.
- Sources of data and information include:
 - Existing sources, such as published reports and materials submitted by stakeholders. EPA is already in the process of collecting this information. EPA is interested in collecting any qualitative or quantitative data that participants might have.
 - New sources. The study itself will generate more data, as will other ongoing studies. Data from these other investigations will be incorporated into the study as much as possible.
- Fate and transport includes characterizing fracturing fluids and their degradation products, determining HF's potential to mobilize chemicals from geologic formations, and identifying and refining methods for chemical analysis.
- Case studies provide opportunities for focused field investigations. The SAB recommended the case study approach, and participants in tonight's meeting can help by suggesting possible locations.
- Case studies will also allow EPA to evaluate HF in different parts of the country, in terms of geologic factors, water resource management practices, and water quality/quantity variations.

- Potential sites for case studies include areas where HF is planned, is in progress, or has occurred in the past.
- EPA will identify and prioritize case study locations based on stakeholder input, the vulnerability of water resources (including the proximity of other wells or exposure pathways), the extent of HF activity in an area, geologic conditions, and geographic variations.
- Next steps in developing the study plan include:
 - Collecting stakeholder input throughout the summer of 2010.
 - A transparent peer review process by experts in appropriate fields during the fall of 2010.
 - Collecting public comment on the study plan during the fall of 2010.

How Can Stakeholders Be Involved?

Ann Codrington, Acting Director, Drinking Water Protection Division, EPA Office of Ground Water and Drinking Water

- The most important part of this meeting is the public comment. Additional comments will be accepted until September 28, 2010.
- EPA held four sector-specific webinars and is currently conducting public meetings. Later, EPA will hold technical workshops to collect input from experts in the field.
- The study design is extremely important: a good study design is the foundation for a scientifically sound study.
- There are several ways to provide comments to EPA on the study design:
 - Speaking at public meetings.
 - Submitting written comments at public meetings.
 - Submitting written comments by e-mail or postal mail.
- Key questions EPA would like input on include:
 - What should be our highest priorities?
 - What are the gaps in current knowledge?
 - Are there data and information we should know about?
 - Where do you recommend we conduct our case studies?

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Summary of Public Comments

EPA requested comment on the proposed scope of the study plan and criteria to be used for case study locations. Public comments described regional impacts to public health, the environment, and economics and provided recommendations on regulations and subjects or methods of study.

Public comments have been grouped by common theme: impacts specific to EPA Region 2 and the Marcellus Shale area, recommendations for the HF study, regulation of HF, and other comments.

Hydraulic Fracturing in Region 2 and the Marcellus Shale Area

Speakers both in favor of and opposed to HF identified themselves as landowners, residents, and community members and expressed their appreciation for the clean water and rural nature of Upstate New York and Pennsylvania. Many speakers described the long history of HF in New York State, as well as New York's strict regulations, and noted that there has never been a confirmed case of contaminated water from HF. However, other speakers disagreed that New York's experience with vertical wells should be used as evidence of the safety of high-volume horizontal HF. Speakers commented on the jobs and income that HF could bring to the region (or, in the case of Pennsylvania, the jobs that would be lost if a moratorium were enacted) and noted that this is especially important in the current economic crisis. A number of speakers described their experiences as local residents and landowners and expressed concern that their property, health, and lifestyle will be put at risk by HF. Numerous speakers referenced the NYDEC draft SGEIS. While some speakers argued that the draft SGEIS is evidence of New York's commitment to studying and regulating HF, others stated that the draft SGEIS has significant problems and should be withdrawn.

EPA's Hydraulic Fracturing Study

Scope

Comments on the study scope generally fell into two categories. Commenters in favor of HF asked that EPA not stray from the Congressional mandate, limiting the study to the moment of fracturing and its potential impacts on drinking water. Commenters opposed to HF called for the scope of the study to be expanded to include other aspects of the drilling process and the entire lifecycle of HF. Many of these commenters asked EPA to perform a cumulative impact study. In addition, speakers suggested specific topics that EPA should address in the study, including air impacts, waste disposal, water withdrawals, well cementing and casing failures, health impacts, and the identification of chemicals in fracturing fluid. Speakers also recommended groups and individuals that could provide insight to EPA while the study is conducted. Speakers from all perspectives called for EPA to conduct a scientific study that is not influenced by politics, industry, or emotion. Some commenters asked that the study be discontinued, either because the relevant research has already been conducted or so that the funding could be used to further the development of alternative energy sources.

Knowledge Gaps

Speakers identified numerous topics on which more information needs to be gathered. One primary concern was the identification, behavior, and health effects of HF chemicals, including the effects of chemicals when used in combination with each other. Speakers called for the complete disclosure of proprietary chemicals used in the HF process. Other topics included the identification and effects of natural faults and fractures, the potential for seismic activity and methane migration, and waste management options.

Case Study Locations

Speakers suggested specific and general locations for EPA case studies, including areas in Pennsylvania and other states where HF has already taken place. Areas nominated for case studies included the Delaware River watershed; Suffolk County, Pennsylvania; Booneville, Arkansas; Fort Worth, Texas; northeastern Ohio; Garfield County, Colorado; Pavilion, Wyoming; Durango, Colorado; and Dimock, Pennsylvania. Speakers recommended that EPA make unscheduled visits to HF sites. One speaker recommended using historical records of HF as a case study.

Regulating Hydraulic Fracturing

A number of speakers asked EPA for a national moratorium on HF, either while the study is taking place or permanently. Some speakers asked for HF to be regulated under national laws like the Clean Water Act and the Safe Drinking Water Act, though others noted that previous EPA investigations determined that these regulations did not apply to HF. Some speakers requested regulation for specific aspects of gas drilling, such as monitoring, waste tracking, and chemical disclosure. Speakers also cautioned EPA against overregulation that would hurt businesses, encroach on landowner's property rights, and prevent HF technologies from improving.

General Comments

Numerous commenters described natural gas' role in achieving a clean energy future for the country and lowering the country's greenhouse gas emissions. Other commenters cautioned EPA about the emissions created by the gas drilling process and the risks of fossil fuel extraction, arguing instead for the development of alternative energy sources and a focus on conservation. Speakers also reminded EPA of the Agency's mission statement. Commenters expressed concern about the amount of misinformation on HF. Commenters also raised other concerns related to HF, such as radiation.

Detailed Public Comments

Public comments have been grouped by common theme: impacts specific to EPA Region 2, recommendations for the hydraulic fracturing study (scope, knowledge gaps, and case studies), regulation, and general comments.

Hydraulic Fracturing in Region 2 and the Marcellus Shale Area

Comments on HF in Region 2 and the Marcellus Shale area were as follows:

- While the potential value of HF and the rights of property owners are important, HF has been proven unsafe and the risks are not fully understood. Risks must be fully examined, proper environmental protections be put in place, and the security of the water supply be fully understood and guaranteed before drilling takes place.

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- HF has been used safely for 60 years, without a documented case of contamination. New York State has the most stringent HF regulations in the country.
- The FRAC Act is a stall by people in New York City and its suburbs. People in upstate New York need jobs now and do not have the luxury of waiting. Not allowing HF means preventing a million people from having economic freedom.
- A resident of Dimock received temporary replacement water from gas companies because her drinking water was contaminated. She cannot and will not drink well water due to methane migration. Eventually, Cabot had to provide her family with a permanent water source because the authorities were not confident that safe water could be drilled from that area. In addition, disconnecting contaminated water wells is not always a solution. Had the speaker disconnected her well, she never would have found additional chemicals like ethylene glycol and propylene glycol.
- New York has a right to share the wealth as natural gas is taken safely from the area. We can end dependence on foreign energy sources with natural gas. The use of natural gas has a lower carbon footprint than other forms of energy, and development is challenging but manageable.
- A recently released survey from Pennsylvania State University of 21 Pennsylvanian counties and 8 New York counties above the Marcellus Shale shows that only 21% of people in those counties oppose natural gas extraction. This proportion is not represented at the meeting.
- Until the discovery of Marcellus Shale, Susquehanna County's largest natural resource was clean water. Like much of Pennsylvania, many of the residents get drinking water from private wells and springs.
- The gas industry contends that the HF process has been done safely for 60 years, but this is a new permutation. The effect of the latest technology on drinking water is yet to be determined. The contamination in Bradford and Dimock shows there is evidence of methane migration after the initial vertical well was drilled, and there is also evidence of methane migration from horizontal wells. Both types of drilling are necessary for extraction in Marcellus shale, and they cannot be uncoupled.
- Pennsylvania regulations have not protected drinking water in affected areas. Because of these problems here and in other states, EPA should study the complete extraction process, including a full inquiry into all aspects of the HF process, vertical drilling, and chemical fracking.
- A stakeholder expressed concern about the Delaware River Watershed in New York and Pennsylvania. Areas of the upper and middle watershed are underlain by the Marcellus Shale. There is a moratorium on gas production in the watershed right now, and people are fighting in court to stop test wells. The Delaware Riverkeeper Network has struggled to stop pollution and their work is tied to an anti-degradation campaign. EPA's evaluation is key to the success for protection the millions of people who rely on the river for their water every day. There is tremendous pressure to ignore water quality issues. The

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Delaware River Basin Commission is beginning to unravel under political bullying from gas companies. The current fast-tracked, rubber-stamp regulatory system ignores the toxic aspects of these practices. EPA's arms-length assessment is needed. EPA must not ignore the thorny details of HF that must be regulated on the ground in the watershed.

- HF can be done in an entirely safe fashion. The speaker has visited a gas well site in Pennsylvania and seen the best practices of the industry. The well had a closed system to prevent spills and heavy plastic for storage. The chemicals used for HF have been reduced and none of them are carcinogenic. The speaker urged opponents of HF to go see a well site, take a tour, see for themselves, and find out first hand. EPA should look at the best practices in the industry, as these should be the drilling standards, and HF should be legal in New York.
- A commenter stated that he will not lease his land because of the negative impacts of HF, including impacts on drinking water. He has also been to Pennsylvania and seen wells. The speaker asked EPA to do the opposite of what happened with the Challenger space shuttle, where engineers were told to take off their engineer hats and put on manager hats.
- A commenter with 33 years experience in well completion and management noted that of the thousands of wells he has worked with, not one was contaminated. He is also not aware of any wells directly involved with the contamination of fresh water. Thousands of wells have been drilled in New York since 1950. The speaker has never witnessed a single case of contamination of an aquifer from gas wells, though he has been aware of other commercial activities that have documented instances of damage to fresh water aquifers in the United States, including landfills, housing developments, and roads.
- The public needs to be informed that it is possible to have contamination without gas wells. Federal management is not mandated if NYDEC oversight is adequate. Ten thousand wells have been drilled in the area without incident. NYDEC concluded that not one ounce of drinking water has been damaged by HF in New York State.
- New York's regulations are not the strictest in the country. In Pennsylvania, radioactivity monitors are required on wells, but not in New York. For some wells that are too radioactive to dispose of the frack water in Pennsylvania, they bring it up into New York and get rid of it there. Therefore, people should not just assume that NYDEC has the strictest regulations.
- Films talk about migration into shallow aquifers, but this has been proven by states to be false. The contamination is from algae and natural shallow methane. In *Gasland*, Josh Fox falsely claimed that the Dunkard Creek contamination was from HF. EPA concluded that it was caused by leaks from near-surface coal mines.
- Out of the 14,000 citations on gas drilling operations, only 200 were necessary. Companies wouldn't have been pushed out of business if the top companies hadn't been pushed out of production.
- Continuing to extract fuels, raw materials, and crops from soil by mechanical, chemical, and artificial means disrupts the natural equilibriums of millions of years. Landowner

coalitions are acting as if they've been handed winning lottery tickets but are being deprived of collecting their winnings. What would they have done if Marcellus Shale or the Utica Shale had no gas? Industries obfuscate and do not admit the externalities of their actions. Some trust and have confidence that an understaffed unit of NYDEC can effectively monitor to protect us from our worst fears. HF in the Marcellus Shale and the Utica Shale presents an economic opportunity. But the consequences and the potential for disaster far outweigh the potential benefits.

- A resident of Dimock, Pennsylvania showed a picture of a water sample. The speaker stated that saying there is no drinking water contamination is false and that he will rebut that as much as he can. The speaker stated that he is living proof of what can go wrong. EPA should come to Dimock and witness it firsthand—the air pollution, the greenhouse gases from the wells right into the air. The speaker's neighbors 400 feet away have a device that takes water off the gas and emits gas every two minutes into the air. Every reporter who comes to Dimock gets sick with sore throats—one girl with asthma couldn't even talk. There's methane gas in the speaker's well. He has proof; it was pristine before, and now there are contaminants, including toluene and other chemicals. EPA has to study this a little bit better, because the contamination is not caused by naturally occurring methane. The isotope fingerprints were done and showed it was not from naturally occurring gas. The speaker noted that if things go wrong, then the experience is not fun.
- A resident of Damascus, Pennsylvania has a property that borders the Delaware River, and she enjoys it every day. EPA should demonstrate that this is now a new and improved EPA from 2004, and that the last six years of accidents and contamination have led to the current awakening. The 2004 study is not as conclusive as it is shown to be. The study contained damaging information that wasn't mentioned in the conclusion. Industry representatives maintained that the details would only frighten and confuse the public and cause great expense to competitive business. EPA should stand by the position that natural gas will not come without the expense of lives and resources.
- We should not worry just about safe and clean water but also about not adding unnecessary additional costs. HF technology has been proven over 60 years. Businesses have benefitted—diners, mom and dad businesses—and this can transform communities.
- Natural gas is responsible for 50,000 jobs in Pennsylvania. It is impossible to imagine the Pennsylvania economy with those jobs or to imagine the future without the 212,000 future jobs. Natural gas is an important part of our clean energy future.
- A Pennsylvania resident works for a recently formed company that recycles hydraulic stimulating fluid for future fracking, reducing the need for fresh water. The company has conducted an extensive analysis of 81 samples and, in doing so, developed a process to clean water for reuse. Solid byproducts can go to a landfill, and there are zero discharges. The company is building 12 regional plants with 15 jobs each. In the future, they will have created 180 jobs in Pennsylvania, including auxiliary jobs, which are not portable overseas. Now is not the time to halt this industry with regulations; that would cause small businesses to go out of business.

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- HF is totally safe. Many people want to say it's not safe; they all have interests, but the facts remain that there is not one case in which the water supply was tainted by fracking. The speaker's house was broken into last week—jobs and businesses are leaving the area, and if it continues like this, everybody will be forced to leave. It is EPA's job to make the decision as to whether HF is safe or not. If the decision is made, EPA should make sure it stays safe and work toward the day where there are no accidents.
- Members of the Onondaga Nation used to fish and swim in the creek and lake. Industrial development decided to dump wastes into the lake and pump them underground into the Tully salt mines. There were no regulatory agencies to stop them. Onondaga Lake is now a Superfund site and the Tully mud boils fill the water with sediment. It's taking hundreds of millions of dollars to clean it up. People say HF can be done safely, but there are always abuses and accidents. The speaker asked: What will the land look like for my grandchildren? Will the water be safe in 150 years or will it be a Superfund site? Will people look back and say, "How did they allow this to happen?" We can't live without water. EPA should protect it with full regulatory force.
- There is no scientific evidence of unsafe HF. HF is a safe means of extracting natural gas from the ground. There is a need for good-paying, permanent jobs to promote economic growth in small town America. Every day, the commenter hears that small towns are heading for economic disaster. The commenter has seen firsthand the growth from the natural gas industry, including shopping, restaurants, and hotels. The money streaming into the local economy is not at the expense of drinking water. In many states, there have been no safety issues.
- A Dryden resident has lived in other places, and in each place, the air stinks, the water tastes like crap, and people who drink it or breathe it die sooner. In each of those places, industry extracts, refines, or transports there. The air and water are cesspools for waste. Now it's coming to upstate New York. HF puts toxic waste in the ground, in the air, and even on the roads. People say it's been done before, but it poisons air, water, and people.
- A New York resident is worried that the state doesn't have enough funds. The speaker wants to make sure of what's going to happen, but no one can give a guarantee; people have given quotes from places where things have gone wrong, to make us worried. New York should not be left behind.. Many people identified products they believe are cancerous and build up for years. The speaker's brother died from cancer and she doesn't want to invite illness of any sort. People have gone through many things that are a success, but people are worried when things go wrong. The Town of Union voted down the sale of the speaker's property. The speaker hopes that people will vote with their conscience and be careful.
- A commenter asked how people can be so clueless and careless as to justify HF, when in other states there have been bad impacts on air, water, and land, and when the best natural resource in New York State and the Northeast is plenty of pure, clean drinking water. The speaker mentioned industrial sites, pumping, drilling, holding ponds, millions of gallons sucked up and replaced by contaminated water, burning and exploding water. There are also well heads, pipes, cementing, and other technologies, but even BP couldn't

get it right. While it is good to increase the economy in central New York, it is not right to run the risk of damaging the water supply.

- A commenter asked if there would be enough water in the Catskills to replace the water in central New York if it was destroyed. The speaker asked why central New York is not protected like New York City.
- A commenter expressed concern about the amount of water withdrawn, in particular from local creeks, ponds, and rivers, such as the Susquehanna River. The speaker is familiar with the River Basin Commissions in this area; the Susquehanna and the Delaware are supposed to be regulated, but the speaker feels that they are going to say “Okay, you can take it out,” and they are not going to look at weather conditions or drought. Companies are going to say, “You gave us permission” and nobody is going to check.
- A landowner is very concerned about HF plans in his neighborhood. In Pennsylvania and New York, there is methane in water that was pure until drilling. When well owners called Pennsylvania Department of Environmental Protection or NYDEC they were told, “There’s nothing we can do. It’s natural.” But it didn’t “naturally occur” until drilling began. We should not have natural gas or radioactive materials or chemicals in formerly potable water.
- A resident of Montrose, Pennsylvania has felt fear since moving there, including the psychological and emotional effects of fear and guilt regarding his daughter. Wells are moving closer and closer, and the speaker doesn’t know enough to feel safe. EPA should fill in the knowledge gaps. Information from both sides is flying around and people are feeling battered. There is something wrong about feeling afraid to give your child a glass of water. The speaker invited EPA to come to his farm as a case study.
- A landowner in Delaware County had a heartbreaking conversation with a farmer. The farmer had leased his land to a gas company, and he said, “They never told me they would use chemicals.”
- Commenters mentioned EPA’s criticism of NYDEC’s draft SGEIS and asked EPA to stand behind their remarks. Commenters called for NYDEC to withdraw the draft SGEIS.
- Community members who are not usually involved are seeing the impact of HF, hearing from Pennsylvania, and getting involved. They didn’t realize what they were getting into. They did not realize that there would be so much water wasted. They did not know that the drilling would go all day and all night.
- A scientist and farmer noted that this is not a “not in my backyard” issue—it affects the entire nation. The speaker is heartened to hear about the full, comprehensive study because this process should not be fast-tracked. EPA is our only hope to balance the tremendous power and money of oil and gas companies. She is tired of reading industry-funded studies and feels that the latest Broome County study is fatally flawed.
- A Pennsylvania resident has traveled extensively and met many residents, gas line workers, and landowners. He has mostly heard about people’s concern about illegal

dumping, runoff from poorly managed farms, industrial waste, and forest management—not the dangers of HF.

- The owner of a small organic farm in the Finger Lakes recounted how an absentee neighbor drilled a well for water. For the first time in nearly two decades, the speaker had petroleum-based pollution in his family's spring water supply and in the well. The speaker recommended erring on the side of doubt and caution.
- NYDEC's budget has been cut by a third. They do not have the resources to adequately regulate the drilling.
- A stakeholder who works for a trucking company in Pennsylvania noted that one hundred percent of their business is from oil, and that Marcellus Shale drilling has created 70 local jobs already. It has helped the community, restaurants, hotels, gas stations, coffee shops, and much more. The speaker urged EPA to help New York come out of the depression it's in and help its work force by putting America back to work. New York needs the gas industry; some oppose it but, all in all, everyone would benefit greatly from the money they could get.
- Is a generic EIS appropriate for HF? The geology of the land is very complex, and there is a huge difference in the land from one property to another. It needs to be more specifically targeted. The notion of a generic EIS for the entire State of New York is ridiculous because it is so diverse.
- New York has been fracking since 1962. There have been over 800 wells that have been fracked, and there have been no cases of contaminated drinking water. Texas has been fracking since the 1960s with no contamination. The commenter has faith in NYDEC and what they do. EPA needs to stick to the topic of examining the relationship between HF and drinking water as mandated by Congress. On reviewing the scope, EPA poses dozens of questions that stray far from the mandate. These are already addressed in existing regulations. Further studies are inappropriate and a waste of taxpayer money. HF has been occurring for 60 years without a single case of contamination. That track record should speak for itself.
- A stakeholder who recently worked in Dimock stated that safety and health issues for workers need to be addressed. The speaker described an acquaintance who died after working on HF and another who became very sick. The speaker feels that in this business, workers are treated as though they are dispensable and noted that the integrity in this industry doesn't bear up well.
- Landowners wish for the truth and nothing but the truth. NYDEC is doing a good job and the new regulations will be very strong and restrictive, possibly the most restrictive in the world. Science should dictate the process, not politics or politicians.
- A stakeholder has had to replace her windshield twice in the past 10 months because of debris from big trucks. In addition, the increased traffic has doubled her driving time in the county. The speaker predicted a series of catastrophic events stemming from HF and gas drilling in the future.

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- HF, as it's been touted by the gas industry as having existed for 60 years, is not the same thing as what is happening now in Pennsylvania. This is high-volume slickwater HF, which has 100 times the impact because it requires injecting a million gallons of water and chemicals into the earth.
- EPA and policy makers should consider the fact energy equals jobs. Marcellus Shale development has created over 800,000 jobs in New York and Pennsylvania. Natural gas is critical for farming and manufacturing industries, and supports millions of small businesses nationwide. Suspending HF would reduce the GDP of the United States and eliminate more than 100 million jobs.
- HF was developed in 1947 and first used commercially in 1949, 61 years ago. EPA is wasting people's time and money investigating a 60-year-old technology. NYDEC spent two years investigating and drawing up new regulations for natural gas and HF. The results will be ready in spring 2011. There is no need to duplicate all this work. People trust NYDEC and EPA. Seventy thousand wells have been drilled in New York over the past 100 years. Many were fracked, and New York still has a healthy population. The waters of New York are contaminated with mercury from coal plants, and there are contaminated fish that pregnant women and children shouldn't eat. Natural gas-supplied power alleviates this problem and several others.
- Natural gas is the cheapest, quickest way to reduce CO₂ emissions, and we must do this as soon as possible. The Clean Air Task Force report says that there are 13,000 premature deaths yearly nationwide, 945 of them in New York, due to coal. We are ready to move ahead with cleaner fuel, and natural gas is the choice. We are ready to move forward safely. This has already been reviewed and studied for more than two years. Therefore, between NYDEC and the landowners, drilling will be done more safely in New York than in any other area in this nation. We need cooperation and willingness to learn about the process and not the misleading facts that have surfaced. HF has been done for years and is proven to be safe.
- Our future depends on Marcellus Shale HF. The commenter believes in balance, in the triple bottom line of environment, community, and economy. Nothing is more important than improving sustainability through HF of the Marcellus Shale. It is a more beneficial option than oil or coal. People are well-intended but misguided. Opponents of HF don't understand the facts or how to weigh risks and benefits. EPA should look at the big picture, the macro-environment, and to small picture, the micro-environment. EPA should look at the facts: they say that natural gas buys us time to find renewable energy and the option for us to have a real future.
- A Pennsylvania resident described a drilling site in the Upper Delaware River Scenic Area. Drilling started ten days ago, and the neighbors next door already have brown water. Nobody knows the cause and effect. In the meantime, the speaker expects he will have to sign a lease because other neighbors have signed. The whole area is a tributary to the Delaware, so drilling can compromise all of it. Roads are already getting bad, and when the train goes by the whole mountain shakes. Does this affect the well cementing and casing?

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- There is a Cargill salt mine under Cayuga Lake. A hundred thousand people get their drinking water from that lake. The well is buffered with limestone, and there is some mercury present from a coal-burning power plant. This would be an interesting site to examine, because Cargill worried that seismic and drilling might trigger methane in their mine, overcome the handling systems, and put methane in the water source. Keeping away from lakes that have large empty mine shafts is a concern.
- EPA's job does not include economic development. Rather, EPA's job is the environmental protection of air, land, and water. The speaker's hometown is a small town with a lot of trucks. Water withdrawal sites take up to 4 million gallons a day. The speaker witnessed trucks spraying for dust control and grabbed a sample of the fluid. The speaker understands that people want to capitalize on the land under their feet, but property owners do not have complete control of their land. The few are deciding the fate of the many.
- A Pennsylvania resident congratulated New York on their moratorium, but noted that Pennsylvania residents do not appreciate being used as guinea pigs. The speaker recommended EPA keep things simple. First, we all need clean air, clean water, and natural gas, if it can be done safely. The speaker asked that EPA halt or slow down HF in Pennsylvania until more honest information can be conveyed to the public. The speaker lives in Bradford County and feels scared and concerned. His domestic well is 505 feet from the first gas well that is being drilled on a three-well pad. The next two will be closer. From the first day, it drained his well almost dry. The water is longer potable, which has never happened in a 35-year history. The contamination was caused from drilling fluids and extreme pressure, with no fracking involved. There is also a spill, and EPA was contacted but the speaker received no answers.
- A commenter stated that during the development of wells in her area, she had to tolerate huge diesel tractor trailers passing each day—200 each day for three days straight, in a place where one a week would be an event. EPA should look at air and water, studies on seismic activity, pad development, transportation, multiple HF wells at one site, wastewater, waste solids, airborne emissions, and disposal. EPA should also look at capping wells and using abandoned wells for disposal. EPA should create a realistic study of the number of inspectors needed to enforce safe regulations. Out of ten wells, there have already been violations and complaints, all in a month. It took DEP three days to respond.
- Stakeholders thanked EPA for holding the meeting in Binghamton and expressed appreciation for the opportunity to speak.
- The gas trapped in Marcellus shale is a precious national resource that is owned by no individual citizen or industry. It is owned by everyone. From a narrow perspective, because of the horizontal nature of HF, gas taken from the land of a lease owner may be drawn from a vein that passes under a neighbor who didn't sign a lease. The speaker's brother and sister-in-law faced this situation. From a broad perspective, the shale gas was formed eons ago. The geologic structures underlie many properties in many states. Gas is the property of all of us and should be used for the benefit of all of us. It's bad

stewardship to use it for the benefit of a small number of landowners and industries. The bad stewardship is especially unfair when the negative consequences of HF will affect so many citizens, in particular through its impact on drinking water. EPA should regulate the use of this common resource for the benefit of the whole United States. The best option is to not use it at all. With global warming threatening all property owners, it's time to march in the opposite direction. Put fossil fuels to rest and spend the drilling money on alternative fuels.

EPA's Hydraulic Fracturing Study: Scope

Comments from the public regarding the scope and content of EPA's study are as follows:

- EPA should not partner with industry or state officials as they conduct the analysis.
- A nurse and resident of Upstate New York asked EPA about public health effects such as those from carcinogens, neurotoxins, and endocrine disruptors. These substances can cause acute and long-term health impacts, some of which are subtle and some of which are more obvious. The speaker asked that EPA investigate all of the health effects in an independent, unbiased study without financial interest from industry.
- Nondisclosure agreements should be waived, and EPA should have full access to affected landowners.
- EPA should be able to sample from ponds and wells during the entire lifecycle of the drilling process.
- The study should look at the impacts of water withdrawals, truck traffic, high-pressure fracking agents, chemical ponds, deforestation, light and noise pollution, health problems, stalling renewable energy initiatives, climate change, and the impact on roads.
- EPA should look at the less tangible impacts, such as the fear that parents feel when handing a glass of water to their children, having 16 wells per square mile, and the impacts on swimming, hunting, fishing, crime, the food supply, real estate values, and living in an industrial zone
- Unless EPA can conduct a complete, broad study of HF's impacts, the money should be used for solar initiatives instead.
- EPA should carefully address the exemption for test wells and monitor the wells closely.
- EPA should identify the residents and workers who have been affected by HF and involve them in the study. In addition, EPA could issue subpoenas to obtain information from other parties.
- Every drop of wastewater and every truck carrying it should be tracked. A program to monitor wastewater should be put in place before any further drilling takes place.

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- The EPA study should not stray from the Congressional mandate. Other areas (such as spills or site development issues) have already been addressed by other EPA or state regulations.
- EPA should discontinue the study and allow HF because the facts indicate that HF is safe. Energy companies using HF can bring the United States closer to energy independence.
- An architect suggested a number of items relevant to architecture and construction that could also apply to HF. The speaker suggested that EPA overturn all exemptions; allow panels to review and amend drilling regulations; ban companies with multiple infractions from having a license; institute severe penalties and fines for lack of prompt notifications of hazards; require a listing of all chemicals; disallow use of fracking fluid as dust control on service roads; require yearly training and licensing; place limits on noise and light pollution near sites; require multimillion dollar insurance policies; consider using escrow accounts for deposits during work that will be returned at the end of the year once the work has been successfully completed; require monitoring devices to test air quality at well sites; require water testing before, during, and after drilling; submit lab reports to local NYDECs; and require that seriously disturbed areas, like streams, be returned to their natural condition; and have arbitration panels for disputes.
- EPA should stay focused on the Congressional mandate because all too often, government investigations go astray.
- Even if drilling happened with distilled water, not chemicals, drinking water could still be contaminated. EPA should examine this issue.
- The study needs to be done well-by-well, not regionally, not generically. EPA must also review the SGEIS and assess the preparedness of NYDEC to regulate the process.
- EPA should look at the visual impacts of drill pads and pipelines.
- EPA should take an honest and fresh look at HF. EPA should use the precautionary principle: don't ask what risks we can cost-effectively minimize to bring risks down to an acceptable level. Rather, look at whether we can prove that this process is safe? Can we prove that it won't harm animals, the environment, our children and grandchildren? Will we saddle our children and grandchildren with public health issues?
- The study should be designed to comprehensively assess the cumulative impacts of HF on both ground water and surface water. It should examine all potential pathways, each site in a watershed context, all the wells in the basin, and the effect on each cycle of ground water in a basin and the effect on hydrology in general. The process of HF cannot be examined in isolation of the necessary infrastructure. Additional pathways should be considered, including on-site spills, leaks, trucks (erosion and storm water), surface impacts, the impacts of clearing forestland (which limits regrowth potential and ecosystem services), and the impacts of the wastewater treatment processes. The study must inform the decision-making processes at the state level, ensuring that all of our water resources are protected. Pennsylvania, New York, West Virginia, and Virginia do not have state-wide ground water and surface water permitting programs. The study must

consider the lack of oversight on withdrawals. Trout are the canaries in the coal mine; the study should examine impacts on aquatic ecosystems before human impacts.

- The Environmental Working Group, a nonprofit based in Washington, D.C., has conducted extensive research and concluded (as described in their report “Drilling Around the Law”) that injected petroleum distillates contain high levels of toxics. It’s important to step back and realize that there is no question that oil and natural gas can and do contaminate water. The question is: does this one part of the process contaminate water?
- All people have about 50 trillion cells, and each one absolutely needs clean air, clean water, and 11 inches of top soil to provide nutritious food. A company knows it can make a lot of money by extracting gas, but, being a toxic process, it also knows that it could not do it without contaminating air, water, and soil. With large cash reserves, companies got federal agencies under the Bush Administration to exempt them from all regulations related to clean air, clean water, and toxic sites. The speaker asked if this study intended to prove them wrong. Gas companies have essentially admitted that they would poison these essential ingredients of life. If EPA does go on with the study, EPA should consider the body of water that is a pregnant women as she grows a child. That body of water is essential for the health of the next generation and is affected by all the chemicals and pollutants of the process.
- EPA should consider the process cradle to grave. Will EPA consider the entire lifecycle in the study? Will EPA study what is left behind long after the wells are abandoned? Will EPA consider private wells and not just municipal water supplies? Will EPA go to Dimock?
- Nearly 1 million wells have been safely hydro-fracked, but fear still exists. EPA should address this, but do it scientifically. It is extremely important to stay focused on the single issue of whether HF is safe for drinking water—without the distraction of Hollywood-style pretend documentaries that found concerns but not the true source.
- EPA should talk to affected communities, especially those that have been silenced by industry nondisclosure agreements. EPA should understand how and why the Pennsylvania Department of Homeland Security has done surveillance on those speaking out. A memo and a private e-mail were leaked saying that the Director for the Office of Homeland Security, James Powers, wants to continue to provide information to gas companies and not citizens.
- EPA should focus on all the people whose wells were contaminated but had to sign confidentiality agreements. There are probably many of them out there and the number of contaminated wells is very underreported.
- The items in Table 1 of EPA’s handout are all relevant issues that warrant study. EPA should not prioritize some items and ignore others. How can we argue the relative risks of toxic chemical cocktails, versus spills directly into streams, versus the escape of fluids into drinking water? We cannot and should not.

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- All potential impacts should be studied. They are interrelated and cumulative, EPA should not focus on each singly. For example, how do the water withdrawals of two to five million gallons impact water drinkability and lakes, reservoirs, and streams? These can be the recipients of discharge or spills, and withdrawals can cumulatively lower water levels and impact water quality. We need to work individually and collectively to ensure the quality of private and public drinking water supplies and the environment.
- EPA should look at the real unskewed facts, not feelings. EPA should release these facts to debunk the myths once and for all.
- Where is the gas going? EPA should find out what is happening with the roads, water, air, and land. We should be stewards of the planet and hand our children something better than we were handed ourselves.
- HF is safe when done correctly. The study EPA is mandated to carry out is on HF and drinking water. This is a political mandate; as far as the speaker can determine, there is no scientific evidence that HF affects drinking water. The speaker asked EPA to keep their focus.
- EPA should talk to experts, such as state regulatory agencies, who have enforced rules for decades. Is there documented evidence of contamination? How likely is it that contamination will occur in the future.
- Keep the scope focused on the scientific study of HF.
- EPA should examine past experiences. This is not something new; EPA should look at what's been done and be sure to interface with state agencies. EPA should also investigate a company that has a Binghamton facility for treating frack water.
- EPA needs to keep in mind that any energy source has problems. A speaker noted that there is no question that there are problems in Dimock, but there is a price to be paid with any energy source. Which is worse: 14 water wells contaminated or the lives of 29 miners? We all use energy, we need energy, and this is a matter of judgment. EPA should keep that in mind when making their final conclusions.
- The Cortland County Health Department criticized the draft SGEIS for public health reasons. EPA should focus on four public health issues. First, air quality; few studies have been done on health effects, but preliminary results indicate chemicals are linked to air quality and health. Second, is radioactive wastewater handled safely through all phases? Third, the contamination of the food chain with carcinogens and endocrine disruptors. Fourth, water. Most of the water around here is from a sole source aquifer. This means there is no other economically feasible source of water. Thirty-nine thousand people depend on that water, but the land is now leased to gas companies. A minor mishap would affect public health because the chemicals are potent in very small amounts. Public water supplies are only tested every three years. This is long enough for serious health consequences. Private water supplies are rarely tested. In Cortland County, contamination occurred 3,000 feet away from a drill site in the 1970s, and 17 homes were left without water.

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- If EPA wants to protect health and the environment, as they said in the presentation, EPA will have to expand the study to a full lifecycle analysis of all processes associated with HF. EPA will have to expand the study to include the cumulative impact of this new, extreme, radical, unproven technology. EPA will have to expand the definition of drinking water to include existing and potential sources.
- EPA should focus broadly on HF's impact on water, from the transport of chemicals, to the injection itself, which could free up gas for migration, to disposal of wastewater. EPA should do on-the-ground testing in areas where there is currently HF and areas that are already suffering contamination, and new areas. EPA should seek out baseline tests, then conduct second tests after drilling but before fracking, and then a third test after fracking. Finally, EPA should look for chemicals likely to be associated with HF, such as benzene, ethyl benzene, xylene, and toluene.
- A former engineer stated that cement failure caused the contamination in Dimock, and also the Gulf leak. The speaker noted that properly designed and placed cement is the chief mechanism to protect water resources from contamination. The cement is subjected to extreme temperatures, pressure, and vibrations. The speaker mentioned the petroleum industry study "From Mud to Cement – Building Gas Wells," which illustrates the results of improper selection and design. The speaker stated that each gas well needs specifically designed cement, and federal and state regulations should demand studies to ensure that cements are properly designed.
- EPA should include a complete lifecycle analysis including spills, truck accidents, well site accidents, and migration of chemicals and methane years later. All can cause contamination.
- A landowner quoted from James Northrup's report "The Unique Environmental Impacts of Horizontally Hydrofracking Shale" and expressed concern about seismic events. The speaker noted that these activities leave behind environmental and public health disasters for future generations. Also, methane is 25 times more powerful a greenhouse gas than carbon dioxide.
- Financial benefits are unquestionable and undeniable, but the potential risks, as evidenced by Dimock, the Gulf, and San Bruno, are also undeniable. EPA should focus on the full disclosure of chemicals and possible side effects. NYDEC's draft SGEIS identifies issues that EPA could look at, like drinking water sources and supplies, naturally occurring radioactive materials, the full disclosure of fracking fluids, and human health risks. The source of water for HF should be stressed also. The speaker's understanding is that greener chemicals are available. If that is the case, EPA should look at the work of Theo Colborn and Josh Fox, as well as the precautionary principle.
- EPA should verify information from gas companies by making unannounced visits and evaluations of well sites. EPA should inventory chemicals on well sites and not trust the gas companies. The study should examine the entire lifecycle of HF. It's not just about the explosion—it's about the water coming out of the aquifers, it's the air, and it's the soil. Damage can happen at any point in the process.

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- Part of the study should focus on how much energy and resources are used to create a little bit of energy. Taking natural gas from the ground requires millions of gallons for one frack. Eighty million gallons for one well, and when it's all done, most of the chemicals end up in the ground. What happens to these chemicals in the ground? Would it be better to bring in jobs from Canada and Texas or work on local green jobs? Are the jobs coming to the state and increasing the economy like people say? Is that what is happening? It really is coming down to money—money in a time of need. But we need to be worried about our water and land, because it is the only land we have.
- The study should move forward as quickly as possible while recognizing these two priorities: the safety of the workers and the people whose homes are involved, and environmental protection. This is a vast resource not controlled by foreign interests. It's a reliable source of fuel, readily available, and hopefully cleaner. We desperately need jobs; unemployment is unacceptably high. EPA should move forward and move toward a conclusion as soon as possible, and not to allow the pressure of emotionalism to create an overly restrictive environment for a beneficial industry.
- EPA should consider human error as a specific risk factor in the study. How many fractures are propagated? A hundred? A thousand? What's the detection limit for fractures outside the target zone? How do different rock strata behave? Can it be monitored empirically? What is the current time frame for frack observation and what should it be? How long can the steel and concrete structure withstand the effect of brines and bacteria at high temperatures? Are people monitoring this infrastructure? Is there a monitoring requirement for that?
- When examining the jobs brought in by the Marcellus Shale, EPA should also consider the jobs that are lost. Businesses like bed and breakfasts, organic farms, and green building trades will not be viable if drilling comes to the area.
- The scope of the study should broaden to include soil, air pollution, noise pollution, and construction impacts. Second, for stakeholders, EPA should not only invite the gas industry but also consult representatives of other impacted industries including real estate, builders, farming, tourism, and the wine industry. The speaker and others have seen firsthand the dramatic impacts of the prospect of HF on their ability to get contracts to build homes. Also, buyers will exclude properties with leases. Most financial institutions that provide capital have prohibited underwriting mortgages or loans where surface rights have been leased and wells exist.
- EPA should also expand the study to include air impacts. EPA should release their findings as this study progresses, because people's health and wellbeing are at stake now.
- The study's mandate is to study the relationship between HF and drinking water, with a credible approach based on science and reliable evidence from independent sources of information. EPA should keep true to those words.
- EPA should consider drinking water as both ground water and surface water. Syracuse, for example, depends on surface water, which is impacted by erosion from the

installation of multiple pads, interactions with ground water, and chemical spills. It is important to consider both ground water and surface water.

- Keep the study limited to the mandate and include state agencies, the Interstate Oil and Gas Compact Commission, the Ground Water Protection Council, and state officials who have been involved for decades and have extensive experience in HF best practices.
- EPA was mandated by Congress to evaluate the relationship of HF and drinking water and should not stray from this mission.
- EPA should consider the following questions: If HF falls under the Underground Injection Control (UIC) program, what legal issues would arise? How could a wastewater treatment plant filter out low-level radioactivity when it occurs? How could limits be enforced daily by inspectors in the field? How often has HF exceeded limits? What will be the impact of pressure, heat, and vibrations over time?
- It is impossible to separate the well, the well casing, and cementing from the question of HF and drinking water. What is missing is characterization of the casing itself. Specification of that casing should be in terms of the pressure it will actually withstand rather than the pressure it will theoretically withstand. The commenter does not know if there is any test in place for verifying that the well, casing, and cementing are actually satisfactory for the job it has to do. Static well pressure is 2,500 psi and it is possible that HF fluids can leak by and get into drinking water. The speaker recommended requiring leak testing and pressure testing of the casing as a criterion of the process; we need regulations in place to make sure it's done and done right. Maybe then we can make some gains in the area where there have been problems, because there have been a lot of recent problems, such as Pennsylvania blaming casings as being the primary cause of failure and drinking water contamination.
- EPA should listen to the mayor of Dish, Weston Wilson, and the Mobil technician who said there were unacceptably dangerous conditions. The absence of knowledge does not mean the absence of harm.
- It is important to look at all of the materials coming out, the chemicals going in, and what additional materials they picked up during their journey. The study should look at these issues so that by the time EPA is done, people will not disagree over whether there has been drinking water contamination. EPA should take a broad view of the potential health impacts on air and water and local residents of mining installations. Also, EPA should examine the environmental impacts of fragmentation, the number of wells, and the aggressive implementation of this mining scheme throughout the state. Will it have a negative impact on forest species? Invasive species issues are also a concern. Some of the worst invasive species issues are in the lakes and waterways in New York. With the sheer volume of trucks and the number of sources of water, despite using biocides, these issues are important.
- EPA should study the cradle-to-grave process and to include air conditions as well as water.

EPA's Hydraulic Fracturing Study: Knowledge Gaps

Comments from the public regarding knowledge gaps on the subject of hydraulic fracturing are as follows:

- The drilling industry puts forth misleading claims stating that problems are from well construction and casing failures, not from the initial drilling, and that the percentage of toxins used is too low to cause harm. The industry does not know the locations of fractures and fault lines and does not admit that nothing can decontaminate water or eliminate chemicals.
- The largest challenge is water management, especially disposal. NYDEC is correct in addressing the issue, but if EPA must do so too, EPA should be guided by science and facts, not politics or hysteria.
- Geologists have expressed significant concerns that EPA and NYDEC do not understand the area geology. The mapping technology is out there, but EPA and NYDEC cannot gather and analyze the geological information right now. EPA has the legal right to demand the confidential, extensive reports of gas companies, including economic information, before granting a permit.
- Chemicals disclosed by Chesapeake show that many of the contaminants are serious health hazards including benzene, methanol, formaldehyde, and several mixtures with undisclosed ingredients—but there are no special handling processes. Until EPA fairly assesses this through field studies of pollution and cumulative analysis, there should be a moratorium.
- What is the cumulative impact of HF, especially on greenhouse gas production?
- Methane migration into wells can happen naturally, but that happens because there are fissures in the rock. The whole point of HF is to blast away rock to make gas migrate into more wells. The speaker asked if that would cause more migration than would occur otherwise.
- With regard to gaps, EPA should require mandatory disclosure of chemicals, including quantities and combinations. EPA should examine all of them as well as those in the ground. We don't know how they behave when they are put together. This is a huge unknown.
- A speaker read the poem “The Peace of the Wild Things” by Wendell Berry. She described the experience of digging her family's pond and stated that it taught her that the makeup of the earth is complex and often unexpected. Methane will surely migrate in unpredictable ways. There is already contamination at frack areas. EPA will need a veritable army of experts, as well as more funding, to address the questions in all areas.
- In order to have a proper understanding of the impacts, EPA must know not just the names of all the chemicals but the CAS numbers for each ingredient in the products. Only then will we have an accurate picture of what is going into the environment.

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- HF is a private property rights issue. For example, DEP in Pennsylvania has stated in a case from a year ago that Chesapeake was fined \$15,000 for spilling hydrochloric acid earlier this year. DEP said they did not disclose exactly what the chemical was or the use of the chemical because it was proprietary—not just the chemical, but the use. The speaker noted that that information doesn't tell us a lot, and that people must wait around for the natural gas companies to tell citizens what we're going to be told and when. The speaker noted that EPA has had the same problem in Wyoming.
- A landowner asked about the new compounds created from the mixing of the chemicals and their effect on life and the environment.
- “Chemical fate and transport” is a key phrase that hasn't been discussed enough. Also, the setback and where the waste will go haven't been evaluated enough. The setback is 150 feet in some instances.
- Where will the waste go? Out of 14 different counties, only one said that the waste would go to an appropriate licensed site. That's not enough. We need a new paradigm of no biocides and seeing that things are biodegradable.
- A Pennsylvania resident expressed concern about future catastrophes from seismic activities. Columbia University documents many earthquakes in New York State. There is the potential for a catastrophic event. Are we prepared to address this scenario?
- A stakeholder expressed concern about the things EPA still won't know after the study is done. The reality is that HF and other practices result in low-dose, long-term exposure which will be nearly impossible to study. EPA should err on the side of caution for health and the environment, because lives depend on it. EPA's study will be probably be definitive and people are looking to EPA as the government agency they can trust.

EPA's Hydraulic Fracturing Study: Case Studies

Comments from the public regarding case studies to be conducted during the study are as follows:

- Multiple commenters recommended that EPA make unscheduled visits to HF sites.
- EPA should use the upper Delaware River watershed for a case study. The Delaware River is the U.S. river most endangered by natural gas drilling.
- Areas nominated for case studies included Booneville, AR; Fort Worth, TX; northeastern Ohio; Garfield County, CO; Pavilion, WY; Durango, CO; and Dimock, PA. Speakers also noted that a study has already been started in Pavilion, WY.
- HF success stories from 28 states over 60 years should serve as a case study.
- EPA should visit Suffolk County and follow up with the 2004 study, looking at the changes in the intervening years that have manifested over time, not just drilling.

- Conduct case studies in Dimock and the other places mentioned in *Gasland*.

Regulating Hydraulic Fracturing

Comments from the public regarding regulation of hydraulic fracturing activities are as follows:

- Why is there more oversight for the toxicity of chemotherapy drugs than there is for HF?
- It is EPA's role to provide regulations that mitigate the risks of these activities, because there are big risks in need of regulations.
- Stakeholders expressed concern that a moratorium would halt the development of the HF technology and prevent it from improving.
- The HF technology that prevents damage is unquestionably in place. Everything, including drilling and water management, is tightly regulated by the states.
- Highly locality-specific technologies must be monitored to prevent localized disasters.
- Numerous stakeholders asked EPA for a moratorium on HF while the study is taking place.
- Numerous stakeholders asked EPA to require full disclosure of the chemicals used for HF.
- EPA should monitor gas wells for VOCs and require gas companies to disclose HF pressures.
- A landowner noted that his business has suffered under EPA, NYDEC, and other regulations. Elected government is creating the demise of wealth producers. New York State has stopped the very business that could give upstate New York businesses and people a chance to survive, on no evidence.
- A landowner stated that not allowing HF is an irresponsible removal of his property rights.
- We need empirical data before proceeding with HF, and this cannot be undertaken in a limited time. While EPA does the study, more wells will be drilled and more water contaminated. Participants should ask their elected officials to pass a national moratorium so that EPA has time to study the issue.
- Those who are opposed to HF will use excuses to delay drilling and will never change their bias, but the great majority of people demand the truth. EPA should keep their focus to provide that truth. Justice delayed is justice denied. In 1995, under President Clinton, and again in 2004, under President Bush, the government concluded that HF is used to stimulate development and not to dispose of waste, so it is not subject to the Safe Drinking Water Act. EPA found that HF was safe. Let science prevail, not misinformed public pressure.

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- President Obama should call for a national moratorium on HF while the study is conducted. People have had wells contaminated and people know that there is a very serious health hazard underway in the United States right now. The speaker is deeply disturbed and upset that our government would allow such a process to take place without the proper scientific evidence and understanding of the process.
- The environmental lobby should be ashamed about spreading misinformation. This meeting is attended by emotional activists who are not treating this issue with the levelheadedness it deserves. The environmental lobby has decided that after 60 years, HF is large enough to shake down. They hope EPA could provide the leverage no lawmakers could pass. They decided that the study from six years ago was false—but if we could not trust EPA to take water samples in 2004, what are we doing here today? People should read the reports.
- EPA should ask the people in San Bruno, California how safe gas is. EPA should reinstate the Clean Water Act and the Clean Air Act—that would slow everything down enough. We don't need a moratorium, just to put safety first. People have the right to do what they want with their land, but EPA has the responsibility to protect the United States.
- HF should be properly regulated and there should be an ongoing review process to update regulations.
- Everybody talks about the Safe Drinking Water Act, but EPA should look at the Clean Water Act too. Many provisions should be followed, especially in small wetlands not protected in New York State—they need the Clean Water Act.
- HF fluid left over causes problems in the ground, and trucking should be controlled and tracked. In other areas, they've taken it and dumped it; EPA should look and make sure this isn't happening. EPA should make sure that doesn't happen in the future. New York City's water should not be more important than anyone else's.
- A stakeholder submitted comments to New York on the SGEIS in December 2009, concluding that there should not be continued drilling in the Marcellus Shale. This is still his conclusion. The speaker believes that a permanent moratorium in the Marcellus Shale is still needed. While the speaker is well aware of the value of gas in the Marcellus Shale, he feels that EPA should repeal the exemptions from the Clean Water Act and the Clean Air Act and include H.R. 2766 in the Safe Drinking Water Act.
- EPA should require an environmental impact study for each drilling pad and well and each construction project for pipes and roads. EPA should clearly state that the oil companies will fund the research for the environmental impact studies. We need regulations for building, water use, and disposal.
- Stakeholders requested a national moratorium on HF until the study is completed. Natural gas will only become more valuable as we uncover more beneficial ways to extract it.

- Because the chemicals are proprietary, no one on the federal, state, or local level has been able to make informed decisions about the impact of HF since horizontal drilling began. Last year, EPA said it has no authority to monitor HF because of its exemption from the Clean Water Act and Clean Air Act. So EPA has to take the industry's word on the chemicals being used. The speaker is delighted that EPA will conduct this study, even though it's not under the ideal conditions.
- EPA has great power to stop this process if they choose to use it—not to study it, but to stop it. EPA should use their power to demand a moratorium so that they may study it and make new regulations based on new information, and remediate when they find the obvious: that it's wrong. The speaker asked that EPA exercise compassion.

Hydraulic Fracturing – General Comments

General comments from the public regarding hydraulic fracturing are as follows:

- While one drilling mistake might have a small impact, when multiplied times thousands of wells, it becomes huge. In addition, one water well may have a small amount of toxins, which may seem negligible, but this is not negligible to the people using the well.
- Multiple stakeholders feel that the country needs to work toward a clean energy future and use renewable energy rather than natural gas.
- The country needs to pursue science-based techniques that will not harm the environment or put water at risk, because the rush to judgment can cause unintended consequences that cannot be reversed.
- The country has failed to adequately reduce energy consumption and work swiftly toward alternative energy solutions; meanwhile, the decision to drill was made by energy companies without residents' input.
- Multiple stakeholders mentioned the BP Deepwater Horizon spill and noted that fossil fuel extraction has very large risks. Industry continues to make mistakes and cut corners with regard to safety and the environment.
- Natural gas is a vast, clean resource and offers the opportunity for a meaningful conversion away from oil and gasoline and coal for electricity as well as an opportunity for increased energy security in the United States.
- Natural gas has low carbon emissions compared to coal or oil.
- Opposition to HF and natural gas is encouraged and funded by parties with an interest in foreign oil.
- Natural gas is important for economics and for the development of alternative fuel, but solar and wind power are equally important because global warming is the most significant issue of today. The United States needs to participate on an international level to reduce greenhouse gasses in a meaningful way. President Obama made a campaign

promise to reduce CO₂ emissions by 80% by 2050, but the legislation needed to implement the target stalled in the Senate. The United States needs to confront this challenge once and for all. Delay is no longer an option. Denial is no longer an acceptable response. The human population is six billion and headed for nine billion, and the demand for energy will soar. Solar, wind, and fossil fuels are all a part of that. New York has always been recognized for its environmental laws, but EPA deals with the entire nation.

- It will be 20 years until we reach the core area of the Marcellus Shale, and by then we will have alternative energy. The U.S. Energy Information Administration (EIA) estimates that 10 to 15 years from now, we will get 4% of our energy from shale gas. EPA should do a quantitative assessment. They owe the people a healthy environment. EPA should not compromise the environment for the small amount of energy gain we would get from natural gas. EPA should not discount the people who want to live, work, and raise families in a healthy environment.
- A commenter described Maslow's framework of the hierarchy of human needs, which is shaped like a pyramid. The most basic foundation of the pyramid is air and water. Without them, people cannot survive. People speaking here will give you a deluge of information and reference incidents that will show that fracking poisons those two most basic needs. Every single one of us needs them, regardless of the opinions we may hold.
- We need energy, but it cannot be at the expense of our water, health, and our very lives. The mission statement at EPA is "to protect human health and to safeguard the natural environment—air, water and land—upon which life depends." EPA should work toward that goal. The speaker was cheered when she saw the formal request for chemicals. EPA should not stop now.
- There are several related issues, including growing concerns about climate change and the attempts to mitigate it. Demand has led to extreme extraction techniques, like in the Gulf of Mexico. HF was first used in the Marcellus Shale in 2005, not 60 years ago as is often heard. We will need more and more fossil fuels because of the lack of a national energy policy to decrease demand. The United States wastes 60% of the energy produced.
- While gas is being promoted there is no attempt to find alternative sources of energy. EPA should consider the entire lifecycle of HF, and asked these two questions: Are we so addicted to fossil fuels that we will roll the dice with the natural gas industry? What explanations will future generations have to come up with to make sense of our actions?
- When a stakeholder from Pennsylvania first saw *Gasland*, he was stunned and wondered how EPA could turn a blind eye to this, until he took an hour or two to investigate the facts. The speaker believes that the conclusions of *Gasland* are false and that EPA did its job responding to the incidents. The speaker believes that this meeting wouldn't have half the attendance if people had taken 90 minutes to look at the 2004 study.
- A former senior manufacturing processing engineer used reverse osmosis to remove salt, and the discharge was cleaner than the water taken in. The speaker noted that in 60 years,

the industry has made major improvements in safety and for the environment and that generalized claims about contaminants, considering the great depth difference, are irresponsible.

- A landowner quoted the Declaration of Independence. This country is based on life, liberty, and the pursuit of happiness. The country is founded on it and people have the right to sign a gas lease, but the speaker doesn't trust people who make a 95-year-old grandmother sign a lease.
- We need natural gas now to lower our carbon impact. Clean coal is an oxymoron, oil here is in sensitive areas, and oil abroad is in countries that want to destroy us. We have safely accessed natural gas in the past and can again in the future.
- A speaker questioned EPA's statement that they saw natural gas as an element of our clean energy future, and a bridge to a low-carbon. The speaker did home energy audits in New York, including checking for gas leaks. At least half the homes had gas leaks—not big enough to blow anything up, but a constant leak of greenhouse gases. The speaker referenced a study from Cornell that looked at the overall climate impact of natural gas through HF. It's on par with coal, and that's the worst you can do. People will argue that it's a little worse than coal, or a little better, but nobody knows the amount of natural gas that is leaking from houses. It's like how nobody knows if HF can be safe. The only safe way to sequester a gas that is 70 times more potent than carbon dioxide is to leave it in the shale.
- Sixty-five years ago, the United States defeated a European dictatorship that was using the same propaganda, fear, and half truths as those opposed to HF. Fear is a very strong emotion that impairs reasoning. It sells papers, TV, and radio. Facts do not sell very well, but they are important. Film producers and actors entertain and scare people, but they do not know much about geologic engineering. The speaker encouraged people to look critically at the issue on all sides and think for themselves. They should look critically at where the money comes from for the opposition. They should look at what the opposition did so far: they pitted neighbors against each other and divided families and communities, all because of the "not in my backyard" agenda. They are not for the farmer or the environment—only selfishly against change. The opposition is not about facts. They are selfishly and politically motivated.
- It is unfair to excoriate an entire industry over a few incidents.
- The drilling and HF process has a large carbon footprint, negating one benefit of using natural gas.
- A landowner does not drink the water from her well because of the non-point source pollution that gets into it from golf courses, household chemicals, and salt distribution. The speaker has seen everything from oil tanks to seats from cars washed down her creek. She stated that thinking our drinking water is currently pristine and safe is an armchair environmentalist illusion. The speaker recommended that the United States donate money to help developing countries use natural gas instead of coal, because suppressed and poor areas cannot afford to be environmentally conscientious. EPA

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should focus on the issues and mandate given to it and conclude the study as quickly as possible.

- It is disappointing when citizens find it necessary to lie about HF. EPA has been absent, but, luckily, hundreds of samples have been collected for EPA in their absence. EPA staff are well-educated environmentalists. Federal exemption laws have been in place because hundreds of fracking compounds do not decompose, and horizontal and vertical fracking could not exist without those exemptions. Many of these chemicals don't compose—that's forever. Radioactive substances have million-year half lives.
- A landowner asked how the Constitution's provision of equal rights under the law can be maintained when the right to drill is superimposed over the right to safe water, air, and land. What's life, liberty, and property when the gas companies are holding eminent domain over our land?
- There is not just gas under the ground, there is money. If people don't know who owns their lease, no one knows who will be responsible in the paper maze of ownership if there is environmental damage.
- There is enough energy in the sun in one hour to power the earth for one year. We need to harness this energy now.
- A stakeholder described how her friend did not dare drink the water while on a trip to China. She also described seeing a bald eagle while driving on a local road and noted the great success of the bald eagle in the last 30 years, due to EPA's involvement in regulating DEET. The speaker quoted an article on the Deepwater Horizon spill that suggested people need to be pushed to the limit before change occurs.
- A farmer expressed concern that facts are being withheld. For example, EPA said that the air was clean after 9/11, but it wasn't. NYDEC built a decontamination chamber that was never used. As a farmer, financially, the speaker has to sell his rights to survive. The speaker believes that using fracking fluid to develop a well is ridiculous; the things they are putting in the ground are not good. These agents aren't healthy for treating in a standard wastewater treatment plant.
- A speaker expressed concern about radiation. On Three Mile Island after the meltdown blast, they said nothing happened, but the speaker heard later that thousands of people died. Radiation is manipulating, and can be used to change the weather.
- A bird watcher described a trip to Colorado, to an area where HF is taking place. When he arrived, he saw the big wells and storage tanks. He also saw a lot of cattle, all healthy, and he saw a lot of birds and photographed them. Based on this experience, the speaker feels that HF can be done right. The speaker stated that areas with HF might not be a place we'd want to build a lot of houses, but we need places where you just want farms. We need to look to the future. The speaker acknowledged that HF is controversial and asked that it be done right.

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- Broome County is thinking about turning frack water into road salt. The speaker feels that it might be safer to put desiccated sewage on the road instead.