HYDRAULIC FRACTURING COMMUNICATION PERSPECTIVES

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ABSTRACT: This paper will discuss the need for the oil industry at all levels to broaden its perspective regarding how the concept of hydraulic fracturing is communicated to the public. The current level of communication is so narrowly focused that groups outside of the industry have been able to exploit this communication problem to the detriment of the industry. This paper will discuss specific examples of the communication problems and the corresponding economic and political impacts on the industry.

BACKGROUND: Multistage hydraulic fracturing combined with advances in horizontal drilling and completion techniques have made otherwise marginal quality reservoirs a significant economic development in the United States. The benefits to the United States economy has been breathtaking. The direct economic beneficiaries include the broad oil and gas industry, landowners, royalty owners, local municipalities, school systems, etc. The indirect beneficiaries include the American natural gas consumer, industries that need an economical source of natural gas, the United States balance of trade, anyone who uses electricity, anyone whose health improves with less reliance on coal burning power plants, etc.

The industry, however, failed to appreciate the growing discontent with many groups that were disaffected by the pace of unrestrained development. The focal point issue became hydraulic fracturing in the Marcellus play in the northeast. However, before the broader oil and gas industry realized the scope of what was happening, activists for many causes coalesced opposition to the industry by using the hydraulic fracturing debate as proxy for oil and gas development in general.

CAPITALISM ON STEROIDS: The success of hydraulic fracturing ever longer horizontal wells has been nothing less than "Capitalism on Steroids". According to the Energy Information Agency (EIA), production in the United States increased more in the 5 years ending 2014 than any time in the history of the United States. The production increases were driven by commodity pricing, technology, greater intensity within basins and an expanding number of basins.

Entirely new terminologies evolved. The industry no longer "explored" for oil and gas. The industry now "harvested" resources. Drilling processes were being turned into manufacturing processes.

The economic frenzy was palpable. The race for economic development was everywhere. In less than 6 years, North Dakota increased its production by more than 1,000,000 bopd (EIA). Gas production in Pennsylvania increased 1800% (EIA). Residential vehicle man camps sprang up across the country. Traffic in Midland, Texas at certain times rivaled any major city in the country. Mineral leasing went from hundreds of dollars per acre to tens of thousands dollars per acre.

States and local communities were enjoying massive economic gains and were competing for more. The need for regulatory reform led to ever looser spacing standards, ever looser flaring standards, and ever more flexible proration rules. In some areas, landowners and oil companies omitted provisions for shut in royalties, almost guaranteeing hardship claims before the regulatory bodies to secure more flaring while getting more oil revenues.

Although the pace was not sustainable by almost everyone's standards, the industry failed to see the warning signs on the horizon. The pace was too much for many groups. The common denominator of all these regions became high intensity hydraulic fracturing.

THE OILFIELD DEFINITION OF HYDRAULIC FRACTURING: An informal survey of oil and gas professionals in the State of Texas asked engineers, geologists and managers to define hydraulic fracturing in their own words. All of the 162 people generally defined hydraulic fracturing as a subsurface process that cracked the rock

and used proppants to improve the permeability/productivity of the formation. Hydraulic fracturing had existed for decades in the oil fields of Texas. Horizontal drilling simply involved more stages for each well. This tightly parsed definition was not surprising because the history of the fracturing in the traditional oil states. Fracturing was just part of the production process.

Not a single person in the survey described anything about the complexity of the process. Not a single person talked about the collateral issues. Not a single comment was made about water use, water disposal, traffic, noise, flaring or any other related impacts. Collateral issues in Texas were simply not considered. The vast majority of fracturing was done in rural areas. Flow back of frac treatments was a production process and the waste was reinjected into disposal wells. The use of water has historically been a very low percentage of total water use. Flaring in rural areas was of little consequence.

Perhaps more importantly, private enterprise and property rights were part of the oilfield culture. Surface and mineral ownership were part of the culture. Surface leasing, mineral leasing, and attaching surface use agreements to mineral leases are all common practices. Regulatory processes were generally in place. Oversight mechanisms were largely in place.

In fact, private property rights are partially credited with creating a business environment that allowed the new technologies to develop. By contrast, many professionals question whether shale resource development can ever develop in countries with controlled economies.

Then came the Marcellus basin in Appalachia.

The CLASH OF CULTURES: Unfortunately for the oil industry, the cultural norms of the southwestern states did not transfer to new areas. The clash with local cultures resulted in broader definitions of hydraulic fracturing that are more consistent with their local cultures and included far more of the collateral impacts. While Texas professionals were clinging to their tightly parsed definition of fracturing, they were soon blindsided by the new reality of broader definitions.

WASTE WATER DISPOSAL: Appalachia has been coal country for more than a century with the added benefits of abundant water resources. The sediments, refuse, mine dewatering, and water for cleaning coal are extraordinary challenges that are slow to change because of the impact on local economies and jobs. For contaminated waters, dilution into the environment is an accepted method of disposal. In Pennsylvania, for example, Section 90.102 of their administrative code defines effluent surface discharge limitations for four pollution constituents under 3 different time scenarios. Apparently, the volumes of water in the Ohio and Mississippi rivers are considered sufficient to allow for disposal by dilution.

Consider, for example, the use of impoundments in Kentucky. While the vast majority of people know of the Exxon Valdez incident, very few people in the industry are familiar with a 44.5 MM Bbl spill from a 72 acre, 2.2 Billion gallon waste lagoon near Inez, KY. According to the December 25, 2000 article by Peter T. Kilborn of the New York Times,

“Martin County's torrent of sludge was more than 20 times the volume of the Exxon Valdez's crude oil spill in Alaska 11 years ago. Among coal-mining spills, it was twice that of its biggest forerunner, 28 years ago in Buffalo Creek, W.Va., which killed 125 people and swallowed 500 homes. This time, though, no one was hurt.

A touchy issue involving industry, jobs and the environment, it drew a few headlines but little national interest.

As the spill rolled into 100 miles of rivers and streams, clogging water treatment plants and forcing schools, restaurants, laundries and a power plant to close before dispersing at the Ohio River, Gov. Paul E. Patton of Kentucky, a Democrat and former coal mine operator, declared a 10-county emergency….

…This was not the lagoon's first big leak. Six years ago, more than 100 million gallons, mostly water, escaped, doing little damage. The Mine Safety and Health Administration, a Labor Department agency, found inadequate sealing around the lagoon. The state fined the company $1,600. A plan was prepared with the federal agency to reinforce the lagoon, and the company agreed to adopt it.”

Although there was virtually no national coverage, early horizontal drillers reasoned their impact was less than coal mining and discharged flow back on the ground, into the rivers, lagoons or into municipal sewage systems. Very few in the greater oil and gas industry were aware that some oil and gas operators in the Marcellus area of the northeast were commonly disposing of flow back water in ways that were inconsistent and or outrageous when compared to practices in Texas. In effect, operators in the greater industry are paying the price for the actions of a few operators in a few areas.

The uproar was further complicated when local groups asked operators and their service companies what chemicals were in the fracturing fluids. Industry responded with proprietary claims that protected disclosure. Institutions like the Harvard Law School weighed in on the adequacy of the disclosure program. Environmental groups rallied more, at times, over the disclosure process rather than what to do with the fluids. The environmental movement had found a cause to raise money, awareness, and public ire.

Worse yet, the environmental movement found a cause to coalesce groups with a deep distrust of the industry. For example, there are 1860 Class 2 injection wells in Pennsylvania overseen by the EPA Underground Injection Control Program of which less than 10 are permitted for oil and gas waste disposal (stateimpact.npr.org).

The cost to the industry has been enormous. With the lack of disposal alternatives in the northeast, the industry has been forced to apply expensive reclamation/recycling technologies and/or expensive transportation costs to handle the water. Across the entire industry, chemical disclosure processes became a routine mandate and a routine legal challenge.

FRACING AND WATER CONTAMINATION: While pollution of fresh water aquifers has virtually never been proven to be the result of downhole fracing, there have been surface casing cementing problems that resulted in the appearance of water contamination from hydraulic fracturing. Setting surface casing to protect fresh water in coal country or in peat beds in Michigan are technical challenges. Landowners do not really care about the industry definition of fracing when their fresh water is affected for whatever reason. To this group, the definition of fracing includes these related water quality problems.

FRACING AND FLARING: One of the "black eyes" for the oil industry is the extensive over use of flaring. In prior years, continued production without gas sales was limited. Today, regulatory authority is routinely granted to flare for extended periods of time. In hindsight, the accelerated oil cash flow for a few operators was a major driver of the infrastructure not being built in a timely manner to support the sale of gas. Ironically, the pace of accelerated oil production also proved to be shortsighted since the rapid increase in United States shale oil production contributed to the current crash in world oil pricing.

Excessive flaring was simply wasteful. With no thought about throttling back the pace of development, various groups began to think up ways to creatively use the wasted gas. To this group, the definition of fracing includes the lack of conservations.

Perhaps worse for the industry has been the intense focus on the health and environmental aspects of fugitive gas emissions. This focus was enhanced by the advances in infrared thermal imaging techniques that allowed gas emissions to be "seen". Excessive vapors from a new tank battery near a school in Colorado catapulted sales of the new technology. Had the gas lines been in place with a vapor recovery system, the images would not have had the dramatic impact. To this group, the definition of fracing includes the related health and environmental concerns.

FRACING AND SURFACE CONFLICTS: Many areas of the country have surface ownership that is different than mineral ownership. For the users of the surface, oil and gas development uses some of the surface estate. This use often times conflicts with the way local populations have historically used the surface. To this group, the definition of the fracing includes the costs of the intrusion and the virtual theft of local resources by the federal government or the oil and gas industry.

FRACING AND HIGH ALTERNATIVE VALUE ALTERNATIVE LAND USE: Because fracing began mostly in rural, low population density areas of Texas, the oil and gas industry did not appreciate how the public defined

fracing when the process came close to high value, alternative land use areas. Examples of high value alternative land use areas include:

- Urban/Residential areas of Fort Worth
- Appalachian vacation homes of affluent New Yorkers.
- Tourism areas of Colorado.
- Southern California west of the Rockies
- French country side

To these groups, the definition of fracing includes lower air quality problems, noise, traffic, visual impairments, disruption of vacations, etc.

FRACING AND RENEWABLE RESOURCES: For those opponents to the industry that believe in renewable resources, the success of shale drilling has lowered energy pricing and undermined the benefits of a young industry. According to these opponents, less costly energy keeps consumers addicted to fossil fuels at the expense of renewables. To this group, the definition of fracing includes the impacts on climate change.

FRACING AND FRESH WATER USE: Although fresh water use for fracing is insignificant compared with agriculture, the quality of the water is forever altered. To this group, the definition of fracing includes the waste of fresh water.

FRACING AND CITY PLANNERS: For those opponents to the industry that are involved with public infrastructure planning, too much fracing at once leads to boom and bust planning problems that are not constructive to the long term health of the local communities. At a recent energy symposium, a participant asked when oil companies would be forced to pay for the degradation of the local roads. To the professor's credit, he defended the industry by explaining that taxes in many states that could be used for work on the roads were directed to the state's general fund and not the local municipality. To the local municipality planners, the definition of fracing includes underfunded crisis infrastructure management.

COALESCING OPPOSTION: As the aforementioned impacts suggest, hydraulic fracturing has become a common denominator to coalesce groups opposed to oil and gas development. From a marketing perspective, environmentalists have developed a savvy ability to raise money and leverage the emotions of these disaffected groups. Language has even been used for marketing inroads. The industry has historically used the term "fracturing" or "fracing". Many believe the environmental movement developed the term "fracking" because of the subliminal similarity with more vulgar language (ie.f**king).

While Texas centric professionals limit the definition of hydraulic fracturing to downhole productivity enhancement, anti-oil and gas groups are using a much broader context to galvanize their efforts. The cost of not recognizing the impact of the broader definition of the process can be severe to the greater industry. Several historical events are worth recalling, including:

The Environmental Movement: In 1969, the President of Union Oil, Fred Hartley, when talking about the Santa Barbara channel blowout was quoted as saying, "I don't like to call it a disaster, because there has been no loss of human life. I am amazed at the publicity for the loss of a few birds." The callous attitude by Union generated a visceral response from the public that is credited with founding much of the modern environmental protection movement.

FracFocus Chemical Disclosure Registry: The surface discharge of the flow back of frac fluids or the flow back of the waste water into municipal treating plants in the Northeast is largely credited with costing the industry millions of dollars. As noted above, the industry will be forced to maintain the FracFocus Chemical Disclosure Registry. Prior to the surface flow back problems, the vast majority of professionals believed that flow back of frac fluids was a minor production issue.

Access to lands: For a variety of reasons, including an intense distrust of the industry, the State of New York passed a moratorium on horizontal drilling and fracing:

Emissions: In 2014, the Department of Homeland Security sent out notices to operators in Texas to warn them of overflights by Homeland Security aircraft. The operators should not be alarmed because Homeland Security had loaned is aircraft to the TCEQ as part of their emissions studies. Very few believe these investigations would have been warranted without the excessive emissions from the overzealous pace of horizontal drilling that resulted in massive flaring and venting of the tank vapors.

CURRENT INDUSTRY RESPONSE: While coalitions against "fracing" have been coalescing, the current industry response appears to be focused in three directions. First, the industry wants to illustrate the overwhelming benefits from shale development, including jobs, balance of trade, lower energy prices, reduced greenhouse gas emissions, revitalized petrochemical industry, etc. Second, the industry appears to be defending the downhole environmental protections separate and apart from the other issues. Lastly, there appears to political efforts to maintain state level regulatory primacy concerning regulatory issues.

Unfortunately, these strategies do little to break the process of adversarial groups coalescing against the industry.

OTHER ENGAGEMENT STRATEGIES: The oil and gas industry has so much at stake as these shale programs evolve that serious consideration needs to be given to strategies that engage the various stakeholders and improve the image of the industry. These strategies may offer the opportunity to preempt greater regulation. Engagement strategies might include the following:

Recommended operating practices: The industry has been effective with developing recommended practices for technical standards. This same approach might be used for a broader range of socio-economic issues. For example, an industry committee could develop recommended operating practices in high intensity areas. Some might even question the need for frac job prep on weekends in urban or high impact recreational areas/times. Although this impact example may seem small, the reputation of the industry to many can be enhanced. Traffic, time of day, road construction, and road entry are all examples of operating practices that can be developed in a non-binding, qualitative manner. In Louisiana, for example, the damage to roads and cars were mitigated by adding a small paved transition apron where the lease road meet the public highway. The public relations benefit was tremendous.

Recommended Regulatory Requirements: Although controversial, recommended minimum regulatory processes should be considered. Many states to not have well developed regulatory agencies for oil and gas. If the industry made an attempt to self-police a range of issues, many of the less developed states would benefit from a better understanding of what the broader industry practices have been in other states. Surface discharges of flow back is one such example where recommended industry practices might have preempted the backlash of reaction in the northeast. The amount of authorized flaring could be another area where recommended practices could favorably impact broader public relations.

Recommended Tax Policies: The industry pays a variety of the state and local taxes in various formats. The industry should seriously consider a greater effort to support greater allocations to local communities. Without greater local revenue sharing, a larger number of disaffected groups view oil and gas development as "less of a blessing and more of a curse". If the majority of the severance taxes go into the needs of the state compared with local areas that are dealing with the boom and bust stresses, there will be a larger number of people opposed to oil and gas development.

While these examples may outwardly seem beyond the tightly defined definition of fracing, they illustrate how the industry can be more competitive in the eyes of the public. Having greater empathy for those parties that are collaterally impacted by fracing will make the industry compete more favorably for public opinion. Oscar Wilde wrote about communication in 1887 when speaking of Great Britain when he said "We have really everything in common with America nowadays, except, of course, language". Similarly, industry will be better served if there is a greater understanding of the broader meaning of fracing being used by our opponents.