

Pennsylvanian's Perceptions of Natural Gas Development in the Marcellus Shale: A Summary of Findings from a 2012 Survey



Between June 2012 and October 2012, a random sample of individuals living in counties in the Pennsylvania Marcellus Shale region were contacted and asked to participate in a survey of residents' opinions concerning natural gas extraction in the region. This report summarizes the findings of that study.

Respondents were asked to provide information on:

- how much they knew about issues related to natural gas drilling;
- how much trust they had in various groups and organizations related to natural gas development;
- what they saw as the positive and negative impacts of natural gas development;
- their experiences with natural gas development activities;
- their familiarity with hydraulic fracturing, including the management, disposal, treatment, and possible uses of frac flowback water; and
- their overall support for or opposition to natural gas extraction in the region.

The Sample

The sample was chosen to reflect the views of individuals living in counties with "high" well densities (20 or more wells per 100 square miles) and "low" well densities (fewer than 20 wells per 100 square miles). Counties included in the "low" well-density category were: Bedford, Blair, Cambria, Cameron, Centre, Clearfield, Clinton, Indiana, Lackawanna, Somerset, Sullivan, and Wayne. High well-density counties included: Bradford, Fayette, Greene, Lycoming, Susquehanna, Tioga, Washington, Westmoreland, and Wyoming. A total of 3,505 people were contacted, with 800 providing data for this analysis (a 23% response rate). Half of the sample was

interviewed by telephone and half responded to mailed questionnaires.

Findings

Regardless of whether they lived in areas of low or high well-density, more than 4 of every 10 respondents reported they knew a good bit or a great deal about the economic, social, environmental, and water quality/quantity impacts of natural gas drilling. About one in four felt they knew little or nothing about such impacts:

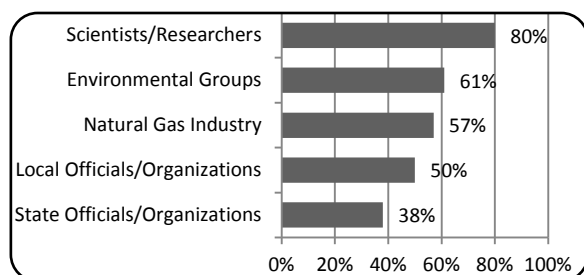
- 47% reported they knew at least a good bit about the economic impacts; 23% felt they knew nothing or very little about these impacts;
- 49% indicated they knew a good bit or a great deal about environmental impacts; 24% said they knew little or nothing about these impacts;
- 46% felt they knew a good bit or a great deal about both water quality and quantity impacts, while 25% knew little or nothing about water quality impacts and 34% knew little or nothing about water quantity impacts;
- those living in areas of low well-density were less likely than those in high well-density areas to report they knew little or nothing about the social impacts (33% vs. 23%).

Asked about how much trust they had in various groups related to natural gas development, residents were most likely to have at least some trust in the views of scientists and researchers, but were least likely to trust state officials/organizations:

- 80% reported they had some or a great deal of trust in scientists/researchers;
- 61% reported trust in environmental groups and organizations;
- 50% trusted local officials and organizations;

- 38% reported they trusted state officials and organizations;
- Overall, 57% reported they had some or a great deal of trust in the natural gas industry, with residents in areas of high well-density more likely than those living in low well-density areas to report such trust (63% vs. 52%).

Percent reporting some or a great deal of trust in various sources of information



Those living in areas of high well-density were more likely than those in low well-density areas to view natural gas drilling in positive terms, but residents in both types of areas often expressed concerns about the industry's impacts:

- In areas with high well-density, 46% agreed but 30% disagreed that the benefits of natural gas extraction outweighed the costs. In low well-density areas, the corresponding figures were 36% and 35%; the remaining respondents were neutral.
- 45% of the residents in high well-density areas agreed, while 36% disagreed that we already knew enough about potential impacts to move forward with development of the industry; for low well-density areas, these percentages were 31% agreed and 44% disagreed.
- 35% of the respondents in high well-density areas agreed that any negative impacts of gas extraction could be fixed; 41% disagreed. In low well-density areas, these figures were 38% and 51% respectively.
- 42% of the high density residents agreed, and 42% disagreed, that they worried there would be some sort of

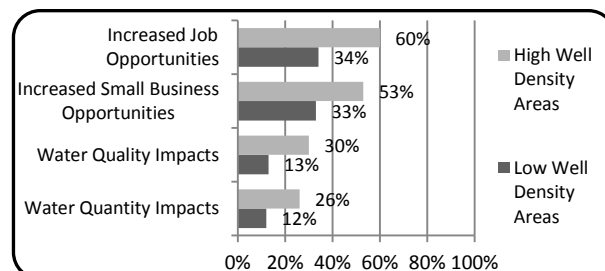
catastrophic accident involving gas extraction. In low well-density areas, these percentages were 49% and 28%.

- Asked whether development of natural gas in the Marcellus Shale would create long lasting environmental problems, 35% of the respondents in high well-density areas agreed and 43% disagreed. In low density areas, 41% agreed while 29% disagreed.

Nearly a fourth (24%) of the survey respondents in the counties with high well-density and 10% of those in areas of low well-density had actually leased land for natural gas drilling. However, of those who had signed leases, drilling or pipeline development had actually occurred in only 19% in the high well-density areas and 8% in the low well-density areas:

- persons in the high well-density areas were more likely than their counterparts in low density areas to have attended a public meeting to learn about drilling and natural gas extraction (22% vs. 13%);
- residents in high density areas were also more likely than those in low well-density areas to report their community had experienced: increased job opportunities for local residents (60% vs. 34%); increased opportunities for small business development (53% vs. 33%); water quality impacts (30% vs. 13%); and water quantity impacts (26% vs. 12%).

Community experiences reported in low and high well-density areas



Natural gas development in the Marcellus Shale relies heavily on the practice of hydraulic fracturing, and it is this practice

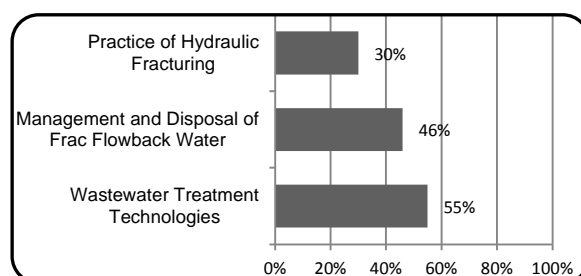
that has raised concerns among some environmental groups. However, fewer than one in five of the survey respondents reported they had a high degree of familiarity with this procedure:

- 19% reported high levels of familiarity with this practice; 30% reported low levels. The remaining said they had some familiarity;
- newspapers were most likely to be reported as the sources of information on hydraulic fracturing in both low and high well-density areas (64%);
- respondents in high well-density areas were somewhat more likely than those where drilling was less dense to report the gas industry contributed to their knowledge of hydraulic fracturing (53% vs. 41%);
- conservation groups were equally likely to contribute to knowledge in both low and high well-density areas, with 43% of the survey respondents indicating they contributed at least some to their knowledge;
- 20% of the respondents indicated university professors and cooperative extension had provided some or a great deal of their information;
- the film *Gasland* was identified only by 13% as an information source.

The term “frac flowback water” refers to water that returns to the surface after a gas well is hydraulically fractured. Only a minority of survey respondents reported they were familiar with the management and disposal of flowback water, and even fewer indicated familiarity with technologies that could remove contaminants from frac flowback wastewater:

- 46% reported they had little or no familiarity with the management and disposal of flowback water; 13% reported they were familiar with these practices;
- 55% indicated they had little or no familiarity with wastewater treatment technologies; 9% reported they did know about such technologies.

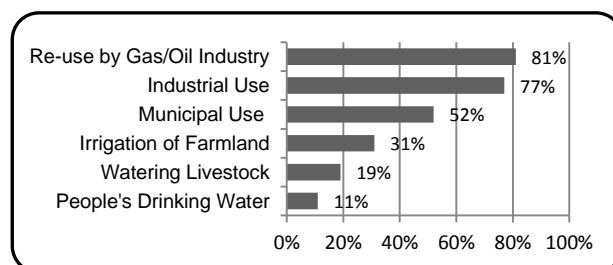
Percent reporting little or no familiarity with hydraulic fracturing



Asked about possible safe uses for treated wastewater from hydraulic fracturing operations, a majority of the respondents in both types of areas tended to believe some uses were safe, but uses associated with human and animal consumption were less widely endorsed.

- Overall, 81% of the respondents believed it was safe for the water to be re-used by gas and oil industry operators. Residents in high well-density areas were somewhat more supportive of the safety of such re-use than were those in low well-density areas (85% vs. 77%);
- 77% reported that use of this water for industrial use was safe;
- 52% felt that municipal use, such as watering golf courses and city parks, was safe;
- 31% reported that irrigation of farmland would be safe;
- 19% felt watering livestock was okay;
- 11% reported the use of treated wastewater for people’s drinking water would be safe.

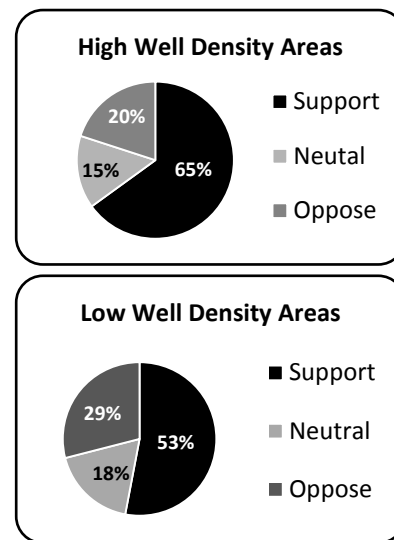
Perceived safe uses of treated wastewater from hydraulic fracturing



Respondents were asked, “Considering everything, how do you feel about natural gas extraction from the Marcellus Shale region?” Respondents in both areas (low and high well-density) were more likely to report support for the industry than opposition, although those in high well-density areas were more likely than those in low density areas to do so:

- 65% of residents in areas with high well-density indicated they supported natural gas extraction in the region, 20% opposed it, and the remainder (15%) were neither supportive nor opposed;
- 53% of the residents in areas with low well-density supported natural gas extraction in the region, 29% were opposed, and 18% were neutral.

Overall support/opposition for natural gas



Support for this research was provided by a grant from the New York State Energy Research and Development Authority. Information from this report may be used without permission. However, a credit line would be appreciated. A suggested citation is: F. K. Willits, A. E. Luloff and G. L. Theodori, *Pennsylvanians' Perceptions of Natural Gas Development in the Marcellus Shale: A Summary of Findings from a 2012 Survey*. University Park, Department of Agricultural Economics, Sociology, and Education, Penn State, 2013.