University of Colorado Denver
School of Public Affairs

July 2014

A Summary Report of Perceptions of the Politics and Regulation of Unconventional Shale Development in Texas

Produced by the School of Public Affairs at the University of Colorado Denver

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Acknowledgements

We are grateful for the individuals in Texas who volunteered their time to participate in this study. This research was funded by the Alfred P. Sloan Foundation, though the research design and results are the authors' alone.

Citing this Summary Report

Gallaher, Samuel, Pierce, Jonathan J., Weible, Christopher M., Kagan, Jennifer, Heikkila, Tanya, and Blair, Benjamin. 2014. "A Summary Report of Perceptions of the Politics and Regulation of Unconventional Shale Development in Texas." Published July 10, 2014 by the School of Public Affairs University of Colorado Denver.

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Executive Summary

This report presents the findings from a survey conducted in the spring of 2014 of people directly or indirectly involved in the politics and regulation of oil and natural gas development that utilizes hydraulic fracturing in Texas. A total of 324 people were administered a survey and 78 people responded representing 61 organizations. These respondents include people from local, state, and federal governments, oil and gas service providers and operators, industry associations, environmental and conservation groups, local citizen groups, academics and consultants, and members of the news media.

Four key objectives guided this study. The objectives and the main survey findings related to each objective are summarized immediately below.

Objective 1: To identify respondents' general positions about hydraulic fracturing used in unconventional shale development in Texas. The findings show that respondents can be grouped according to their position about whether hydraulic fracturing should be stopped or limited (n = 35) or continued at the current rate or expanded (n = 43). These two position groups are used to guide the analysis for the remaining objectives. The majority of environmental and all of the organized citizen groups are a part of the *stop or limit group*. In contrast, the oil and gas industry and state and local governments make up the majority of respondents in the *continue or expand group*. Academics, consultants, and members of the news media are split between the two groups.

Objective 2: To understand the extent that respondents perceive potential problems and benefits associated with unconventional shale development. Potential problems related to pollution, health risks or environmental degradation, and politics are perceived as more severe by the *stop or limit group* than by the *continue or expand group.* In addition, the two groups have different views of the potential benefits of unconventional shale development. The *continue or expand group* agrees that there are economic and environmental benefits from unconventional shale development, while the *stop or limit group* neither agrees nor disagrees about the economic benefits and perceives environmental risks.

Objective 3: To assess respondents' evaluation of recent rules and their preferences for the role of government in unconventional shale development. The *stop or limit group* is unsatisfied that the 2011 chemical disclosure and the 2013 well casing rules resolved the issues they were intended to address. In contrast, the *continue or expand group* is satisfied with these two rules. However, one issue both groups agree that has not been resolved by these rules is public distrust of the oil and gas industry. The majority of both position groups support regulation in some form. There is also general agreement that local governments should regulate setback distances and public nuisance issues. However, the *continue or expand group* on most issues supports state government regulation of unconventional shale development, but the *stop or limit group* tends to prefer federal regulation.

Objective 4: To understand the political activities, resources, and network relationships of respondents based on their position toward unconventional shale development. The political activities that respondents most frequently engage in to influence politics and policy related to unconventional shale development are communicating with the news media, generating and disseminating research and reports, and participating in public meetings. Across almost all activities, respondents from the *stop or limit group* are more politically active. The resource that respondents of both groups have the greatest capacity to utilize is financial resources. The *stop or limit group's* reports moderate capacity for most resources and the *continue or expand group* reports limited capacity for most resources. The two position groups most frequently collaborate with interest groups that share their position and least frequently with courts and the Texas Governors' Office. *The* most important attribute for selecting with whom to collaborate with by both position groups are professional competency and trust. The least important characteristic sought in a collaborator by the respondents is financial resources.

Introduction

This report summarizes a survey administered in the spring of 2014 to individuals who are directly or indirectly involved with the politics, policies, and rulemaking concerning oil and natural gas development that utilizes hydraulic fracturing in Texas. Oil and gas development that uses hydraulic fracturing and horizontal drilling in shale formations is commonly called "unconventional shale development". From this point on we will refer to hydraulic fracturing and horizontal drilling inclusive of oil and gas development as unconventional shale development. The survey was conducted through the School of Public Affairs at the University of Colorado Denver and funded by the Alfred P. Sloan Foundation.

The goal of this report is to provide an understanding of the politics surrounding the issue largely focused on the process of unconventional shale development. We recognize that people relate to this issue from a variety of viewpoints that are impossible to describe entirely in a single report. Instead, this summary report provides a description of the opinions and perceptions of a sample of individuals who are actively involved in unconventional shale development in Texas. These individuals come from diverse professional and organizational affiliations including all levels of government, the oil and gas industry, businesses and trade associations, nonprofits, environmental groups, academia, consulting groups, local citizen organizations, and the news media.

In surveying this politically active population, we were guided by four objectives.

Objective 1: To identify respondents' general positions about hydraulic fracturing used in unconventional shale development in Texas.

Objective 2: To understand the extent that respondents perceive potential problems and benefits associated with unconventional shale development.

Objective 3: To assess respondents' evaluation of recent rules and their preferences for the role of government in unconventional shale development

Objective 4: To understand the political activities, resources, and network relationships of respondents based on their position toward unconventional shale development.

In providing an understanding of the politics and regulations of unconventional shale development, the survey asks respondents to answer several value-oriented questions. We asked such questions not to push a political agenda or a position about hydraulic fracturing, but instead to measure the perceptions of the respondents and to identify areas of agreement and disagreement. Our hope is that through soliciting the perceptions of those actively involved in the issue, we might assist people inside and outside of government in understanding the differences in their positions and potentially find shared understandings that may be used to inform the governance of unconventional shale development in Texas and elsewhere.

This Texas survey is part of a larger research project that includes work in Colorado and New York. In each state, researchers from the School of Public Affairs at the University of Colorado Denver explore the politics of unconventional shale development through interviews, surveys, and document analysis.

Brief Overview of Unconventional Shale Development in Texas

The recent oil and gas boom in the United States began in Texas due to the refinement of two unconventional techniques - horizontal drilling and hydraulic fracturing – and the discovery of shale and other porous deposits holding hydrocarbons (Railroad Commission of Texas August, 2013; Railroad Commission of Texas, February 2014; National Energy Technology Laboratory, 2013). These unconventional techniques increased extraction efficiencies and unlocked trillions of dollars' worth of oil and gas (Rahm, 2011). A key component to unconventional shale development, hydraulic fracturing (also referred to as fracking or hydrofracking) is a process used to release hydrocarbons from porous substrates. The process of hydraulic fracturing includes pumping a mixture of water, sand or similar material, and chemical additives, under high pressure, into vertically or horizontally drilled wells. The process fractures rock formations thousands of feet underground to release oil and natural gas. Hydraulic fracturing was developed by Mitchell Energy in the 1940s, but more recently its use has increased dramatically (National Energy Technology Laboratory, 2013) as it is estimated to be required in up to 90% of onshore natural gas and oil wells in the United States (Halliburton, 2014). The practice is raising questions about whether it improves the economy, employment, energy independence and national security, as well as the degree to which it may harm the environment and public health (de Melo-Martin et al., 2014). The lack of knowledge and consensus about the potential impacts of hydraulic fracturing have filtered into debates about the best way to regulate the practice at the local (Kriesky et al., 2013), state (Warner & Shapiro, 2013), and national (Boudet et al., 2014) levels of government.

Texas plays a major role in the recent U.S. oil and gas boom. In 2012, 35% of natural gas from shale deposits produced in the United States came from Texas (U.S. Energy Information Administration, 2014a). As of 2014, Texas crude oil production accounted for 36% of all crude oil produced in the United States, a majority of which came from shale deposits (U.S. Energy Information Administration, 2014b). Approximately 50% of all drilling rigs in the United States were active in Texas as of May, 2014 (Railroad Commission of Texas, May 2014). In 2011, 2012, and 2013 the Texas Railroad Commission issued approximately 22,000 drilling permits annually, most of which were in one of the four major shale play formations: Barnett Shale, Haynesville/Bossier Shale, the Wolfcamp Shale in the Permian basin, and the Eagle Ford Shale (Railroad Commission of Texas, n.d.). According to the Texas Oil and Gas Association (Texas Oil and Gas Association, 2013), the oil and gas industry paid over $12 billion in taxes and royalties to the state of Texas in 2012. Furthermore, the same report shows that in 2012 the oil and gas industry provided 369,000 jobs accounting for $44 billion in wages and salary in Texas (Texas Oil and Gas Association, 2013).

Unconventional oil and gas development has brought the oil and gas industry to new areas of Texas, including metropolitan and rural communities unfamiliar with this industrial activity (Rahm, 2011). As a result, Texas, like other parts of the United States with surging unconventional oil and gas development, is experiencing conflicts between industry, property rights owners, citizens, regulators, and environmental organizations. These various parties are concerned over a myriad of oil and gas development-related issues such as water use and

pollution (Nicot et al., 2011; Nicot et al., 2012; Freyman, 2014), air pollution (Crossette, 2014), and induced seismic activity (Frohlich, 2012; Connelly et al., n.d.). In many cases, the industry refutes the legitimacy of these issues (Pioneer, n.d.; Encana, 2011; Energy In Depth, n.d). In response to increasing negative public perception of its practices, the oil and gas industry responded in 2011 by organizing opportunities for public disclosure of the chemicals used in hydraulic fracturing. The Texas state legislature passed one of the first bills concerning the disclosure of chemicals in hydraulic fracturing fluids in May of 2011, and the Railroad Commission of Texas promulgated the disclosure rule shortly thereafter.

Local governments in Texas are also actively debating unconventional shale development and creating local policy to regulate the industry. In addition to environmental and health concerns, discussions at the local level involve various issues ranging from socio-economics (Henry, 2013; Prior, 2012) to property rights (Blons, 2014) and infrastructure (Campoy, 2012). Road damage is one of the most prominent issues for local governments, and in 2013 a coalition of Texas counties led by County Judge Daryl Fowler facilitated the passage of legislation to create a grant program for local governments to help pay for road maintenance (Batheja and Satija, 2013). Many of these debates are contentious and result in protests against development or cities passing ordinances to reduce development activity in their jurisdiction.

Scientists and researchers from Texas and elsewhere have approached many of these issues, but to-date few have systematically addressed the perceptions of individuals active in the politics of unconventional shale development in Texas. As a result, many unexplored questions remain. What are the areas of disagreement on these issues? Are there areas of agreement? How should unconventional shale development be regulated? How are those active in the politics and governance of unconventional shale development working with each other? To what extent are these individuals satisfied with recent Texas Railroad Commission regulations? While a single report cannot offer unqualified answers to these questions, our hope is to provide insight into the politics and positions on this issue.

Survey Methodology and Demographic Characteristics of Respondents

The content of the questions and answer categories are informed by information acquired from 12 interviews with experts representing various organizations and positions in Texas. The survey consists of 20 questions with several subparts. A copy of the survey is available in the Appendix.

Survey respondents were identified through multiple sources including: interviews with experts; commenters from Texas Railroad Commission rule-making processes related to oil and gas development since 2011; lists of those present or testifying at legislative hearings on bills related to oil and gas development since 2011; attendees and presenters at academic, government, environmental, and industry sponsored conferences and meetings; organizers of public protests; and news media and online media covering events related to unconventional shale development in Texas. In total, the survey was emailed to 324 individuals and was completed by 78 people, resulting in a response rate of 24%. Out of the total sample surveyed per organizational affiliation type, the response rates are the following: federal government (100%), environmental and conservation groups (52%), local government (50%), academics (32%), organized citizen groups (34%), industry and professional associations (18%), news media (17%), state government (14%), oil and gas service providers and operators (10%), regional government (0%) and other (0%). Some respondents included in this report did not respond to all the survey questions. Table 1 provides a summary of the demographic information for respondents.

Table 1. Demographic Summary Information for Respondents

	Summary Responses
Highest level of formal education	
High School or Some college	5%
Bachelor's degree	39%
Master's or professional degree	37%
Ph.D. or M.D.	18%
Age distribution	
18 to 29	1%
30 to 39	16%
40 to 49	11%
50 to 59	39%
60 or older	32%
Percent male and female	
Male/Female	68%/32%
Organizational affiliation	
Local Government	13%
State Government	7%
Federal Government	1%
Oil and Gas Service Providers and Operators	22%
Industry and Professional Associations	7%
Environmental and Conservation Groups	15%
Organized Citizen Groups	18%
News Media	6%
Academics and Consultants	11%
Years involved in unconventional shale development issues	
0 to 1 years	7%
2 to 4 years	37%
5 to 9 years	36%
10 to 20 years	19%
21 or more years	1%
Hours spent per week on related unconventional shale development issues	
9 hours or less	47%
10 to 20 hours	20%
21 to 30 hours	9%
31 to 40 hours	11%
41 or more hours	14%
Hours spent per week on policy/politics related unconventional shale development issues	
9 hours or less	66%
10 to 20 hours	20%
21 to 30 hours	6%
31 to 40 hours	9%

Objective 1: To identify respondents' general positions about hydraulic fracturing used in unconventional shale development in Texas.

In order to identify respondents general positions about hydraulic fracturing we asked them whether their current position is most closely align with the belief that the practice in Texas should be *stopped*, *limited*, *continued at its current rate*, *expanded moderately*, or *expanded extensively*. The results are shown below in Figure 1. The average respondent supports continuing development at its current rate.[1]

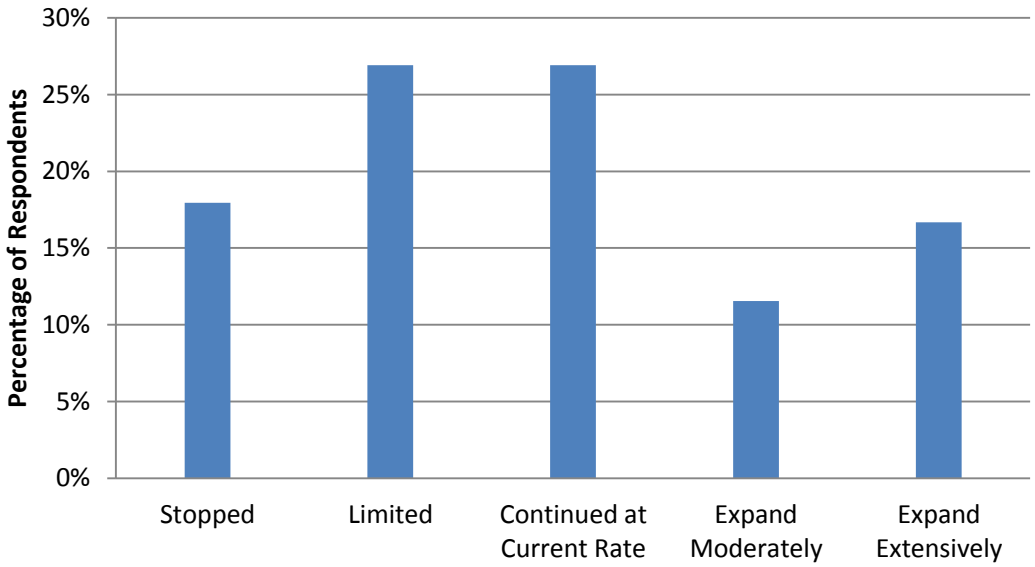

Figure 1. General positions regarding hydraulic fracturing (n = 78)

Based on the results of Figure 1 above, we categorize respondents in reporting the results for other survey questions by dividing respondents into two position groups: a *stop or limit group* (n = 35, 45%) and a *continue or expand group* (n = 43, 55%).

Each of these two position groups includes respondents representing various organizational affiliations. Figure 2 shows the distributions of these organizational affiliations for each position group. State and local government, as well as academics and consultants are in both position groups with the majority in the *continue or expand group*. Respondents from oil and gas service providers and operators, industry and professional associations, and the federal government are only in the *continue or expand group*. All respondents from organized citizen groups believe that development should be stopped or limited, and they comprise 40%

[1] The mean was calculated by assigning numerical values to responses (1 indicates a belief that development should be stopped; 3 that development should continue at its current rate; 5 indicates a response that development should be expanded extensively). The mean response among respondents was 2.82, indicating an average response that development should continue at its current rate.

of the *stop or limit group*. Eighty-six percent of environmental organizations are in the *stop or limit group* and make up 34% of that group[2], but 16% of the environmental organizations belong to the *continue or expand group*. Finally, a majority of respondents from the media also belong to the *stop or limit group.*

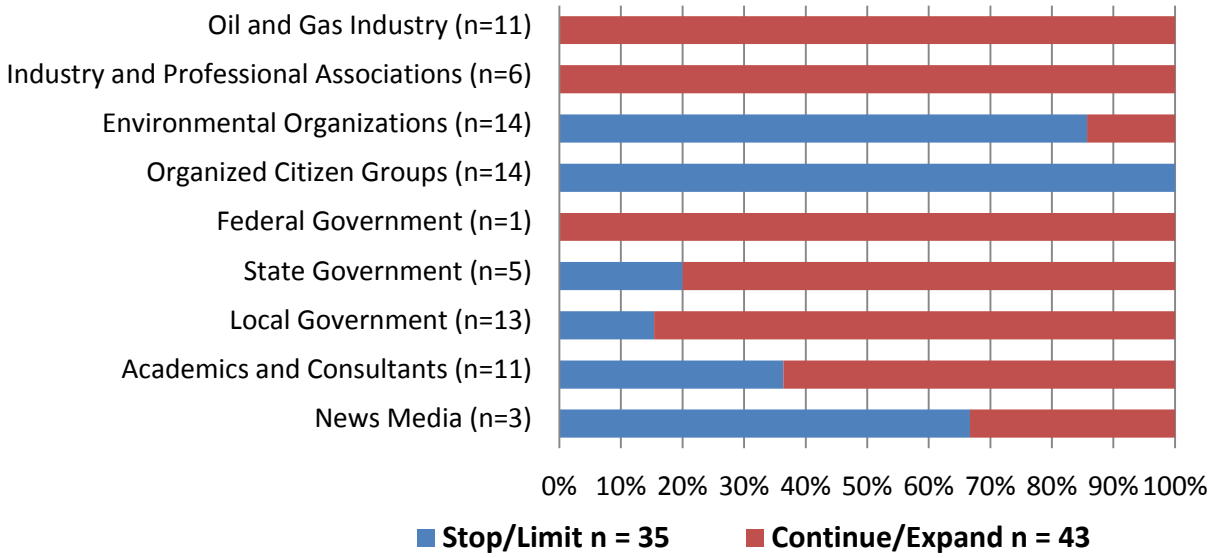

Figure 2. Organizational affiliations by position group (n=78)

[2] Two respondents from environmental or conservation groups out of fourteen stated they believe hydraulic fracturing should continue at the current rate.

Objective 2: To understand the extent that respondents perceive potential problems and benefits associated with unconventional shale development.

Potential problems

The political debates about unconventional shale development are informed by perceptions of the potential problems related to the practice. To understand the perceptions of respondents about political issues related to unconventional shale development, we asked them to what extent they agree such issues are problems. Four political issues were identified based on interviews and primary sources. Respondents are asked to identify the extent that they agree the issues are problems on a 1 to 5 scale (from 1 = *strongly disagree* to 5 = *strongly agree*).

The results in Table 2 show that the *stop or limit group* and the *continue or expand group* differ in their perception of all four potential political issues. The political issue with the greatest amount of agreement is that "Public distrust of the oil and gas industry" is a problem. The *stop or limit group* agrees that this political issue is a problem and the *continue or expand group* have a relatively neutral view of this issue.

The two position groups have statistically significant differences on all four issues. On three of these political issues the difference is between a neutral position by the *continue or expand group,* and a position of either agree or strongly agree by the *stop or limit group*. The issue with the greatest disagreement between the position groups is on "Scare tactics and demonizing of hydraulic fracturing by those who oppose the practice". The *stop or limit group* disagrees that this is a problem, but the *continue or expand group* agrees that this issue is a problem. It is evident that both position groups agree that there are some political problems in relation to unconventional shale development in Texas.

Table 2. Mean perceptions about the extent of potential political issues related to unconventional shale development by position groups

	Stop or Limit n = 35	Continue or Expand n = 43	Absolute Difference
Insufficient capacity by state agencies for regulation	4.7	2.7	**2.0**
Conflict between landowners and their neighbors	4.1	2.5	**1.6**
Public distrust of the oil and gas industry	3.9	3.1	**0.8**
Scare tactics and demonizing of hydraulic fracturing by those who oppose the practice	2.3	3.7	**1.4**
Total Means for Political Issues	3.8	3.0	**0.8**

1 = Strongly disagree, 3 = Neither agree nor disagree, 5 = Strongly agree.
Statistically significant differences between the two position groups are highlighted in bold.

To understand the perceptions of respondents on potential environmental and public health issues related to unconventional shale development, we asked them to identify the extent to which they agree six potential issues are problems on a scale of 1 to 5 (from 1 = *strongly disagree* to 5 = *strongly agree*).

The results in Table 3 show that the two position groups differ on each of the six potential issues. On five of these issues the *continue or expand group* has a neutral position, but the *stop or limit group* either agrees or strongly agrees that these issues are potential problems. On the issue of "Contamination of ground and surface water supplies from the injection of hydraulic fracturing fluids" the two position groups have opposing views. The *stop or limit group* agrees that this is a potential problem, but the *continue or expand group* disagrees. The differences are statistically significant for all six of the potential environmental and public health issues. The two position groups do not agree on the risk posed to the environment or public health by unconventional shale development.

Table 3. Mean perceptions about the extent of potential environmental and public health issues related to unconventional shale development by position groups

	Stop or Limit n = 35	Continue or Expand n = 43	Absolute Difference
Disposing or treating produced water	4.7	2.9	**1.8**
Degradation of air quality from flaring, diesel exhaust, and dust from well site operations	4.6	2.6	**2.0**
Competition over available water supplies	4.5	3.4	**1.1**
Nuisance to the general public caused by truck traffic, noise, and light from well site operations	4.4	3.0	**1.4**
Contamination of ground and surface water supplies from the injection of hydraulic fracturing fluids	4.3	1.8	**2.5**
Induced seismic activity	4.1	2.6	**1.5**
Total Means for Environmental and Public Health Issues	4.4	2.7	**1.7**

1 = Strongly disagree, 3 = Neither agree nor disagree, 5 = Strongly agree.
Statistically significant differences between the two position groups are highlighted in bold.

Potential benefits

To understand the perception of potential benefits from unconventional shale development, respondents are asked the extent that five issues could be potential benefits. These issues were identified based on interviews and secondary sources. Respondents are asked the extent that they agree each of these issues are benefits on a scale of 1 to 5 (from 1 = *strongly disagree* to 5 = *strongly agree*).

The results in Table 4 demonstrate that the two position groups are not in agreement about the potential benefits of unconventional shale development in Texas. For each of the five issues the differences between the position groups are statistically significant. On three of the issues the differences are between disagree by the *stop or limit group* and agree by the *continue or expand group.* On two of the issues, "Growth of the Texas economy through jobs and tax revenue" and "National energy independence" the *stop or limit group* perceives the effect of unconventional shale development as neutral, but the *continue or expand group* either agree or strongly agree that these issues are benefits.

Table 4. Mean perceptions about the extent of potential benefits related to unconventional shale development by position groups

	Stop or Limit n = 35	Continue or Expand n = 43	Absolute Difference
Growth of the Texas economy through jobs and tax revenue	2.8	4.6	**1.8**
National energy independence	2.5	4.1	**1.6**
A bridge toward renewable energy sources from the natural gas produced	1.9	3.8	**1.9**
Benefits to local landowners in Texas	1.9	4.3	**2.5**
Mitigation of climate change from the natural gas produced	1.7	3.6	**1.9**
Total Means for Potential Benefits	2.1	4.1	**1.9**

1 = Strongly disagree, 3 = Neither agree nor disagree, 5 = Strongly agree.
Statistically significant differences between the two position groups are highlighted in bold.

Three trends are seen in the results from Tables 2, 3, and 4 about potential problems and benefits related to unconventional shale development in Texas. First, both groups do recognize that there are some political problems. Second, the *continue or expand group* tends to have moderate perceptions of problems, and in contrast the *stop or limit group* tends to view problems as more severe. Third, the *stop or limit group* is more pessimistic about the environmental and economic benefits of unconventional shale development than the *continue or expand group*. Therefore, there are significant different patterns of perception in terms of the problems and benefits of unconventional shale development based on position group.

Objective 3. To assess respondents' evaluation of recent rules and their preferences for the role of government in unconventional shale development.

Evaluation of recent rules

In order to assess respondents' evaluation of recent rules they are asked whether two recent rule changes by the Texas Railroad Commission resolved various issues. The two rules that questions are asked about are the chemical disclosure rule of 2011 and the well casing, cementing, drilling, and completion requirements rule of 2013. To identify the issues these rules sought to resolve we reviewed documents from the Texas Railroad Commission as well as conducted interviews with those involved in the rulemaking process. Respondents are asked to identify the extent that they agree the issues were resolved by each rule on a 1 to 5 scale (from 1 = *strongly disagree* to 5 = *strongly agree*).

The results in Table 5 show that respondents from the *stop or limit group* disagree or strongly disagree that the 2011 disclosure rule resolved any of the identified issues. In contrast, the *continue or expand group* agrees that four of the five issues are resolved by the rule with the only exception being "Public distrust of the oil and gas industry" which is neutral. There is a clear contrast in the evaluation of this rule between the two position groups and these differences are statistically significant for each issue.

Table 5. Mean perceptions of issues being resolved by the 2011 disclosure rule by position groups

	Stop or Limit n = 34	Continue or Expand n = 40	Absolute Difference
Public distrust of the oil and gas industry	2.1	3.0	**0.9**
Accessibility of chemical information to the public	1.9	4.1	**2.2**
What chemical information must be disclosed	1.9	4.0	**2.1**
How trade secrets are protected and challenged	1.9	3.8	**1.9**
Groundwater protection	1.4	3.6	**2.2**
Total Means for Resolution of Issues	1.8	3.7	**1.9**

1 = Strongly disagree, 3 = Neither agree nor disagree, 5 = Strongly agree.
Statistically significant differences between the two position groups are highlighted in bold.

The second rule that respondents are asked to evaluate is the Texas Railroad Commission's well casing, cementing, drilling, and completion requirements rule of 2013 with the results in Table 6. Respondents are asked to evaluate the extent that four different issues are resolved by this rule. Similar to the evaluation of the 2011 disclosure rule, the *stop or limit group* disagree that any of the issues are resolved. In contrast, the *continue or expand group* agree that the rule resolved three of the issues but did not resolve "Public distrust of the oil and gas industry" which again is neutral. The two position groups have statistically significant different evaluations of these two rules.

Table 6. Mean perceptions of issues being resolved by the 2013 casings rule by position groups

	Stop or Limit n = 34	Continue or Expand n = 40	Absolute Difference
Public distrust of the oil and gas industry	2.3	3.1	**0.8**
Effective control of the well by the operator at all times	1.9	4.1	**2.2**
Long-term well integrity	1.7	4.0	**2.3**
Groundwater protection	1.7	3.8	**2.1**
Total Means for Resolution of Issues	1.9	3.7	**1.8**

1 = Strongly disagree, 3 = Neither agree nor disagree, 5 = Strongly agree.
Statistically significant differences between the two position groups are highlighted in bold.

Preferences for the Role of Government

To assess the respondents' preferences for the role of government in the regulation of unconventional shale development we asked the following question: "If you were to select only one level of government to regulate the following issues related to natural gas development that uses hydraulic fracturing, which would you prefer, if any?" The respondents had four levels of government to choose from and an option of no regulation (*no regulation*, *municipal government*, *county government*, *state government,* and *federal government*). Respondents are asked their preferences on a battery of 11 issues that include many of the environmental and political issues from Table 3 as well as other issues recently debated in Texas. The results by position group are reported in Figure 3.

Figure 3 demonstrates a couple of issues where there is agreement on the level of government regulation between the position groups. The majority of both position groups support regulation for all 11 issues with very few respondents favoring no regulation. A majority of respondents from both position groups prefer that local government should not regulate most of the issues related to unconventional shale development rather it should be regulated by either the state or federal government. There are two divergent cases where respondents from both position groups favor local government regulation (either municipal or county governments): "Setback distances of wells from occupied buildings or natural features" and "Mitigating risks and nuisances to the general public caused by truck traffic, noise, and light from well site operations". Also, respondents from both position groups prefer that the federal government have a role in the regulation of "Safety of the operators at the well site".

While Figure 3 demonstrates some agreement between the position groups about regulation of unconventional shale development, there are also multiple issues where there is disagreement. On eight of the issues the *continue or expand group* clearly prefers state government regulation. In contrast, the *stop or limit group* prefers federal government regulation on seven of the issues. Therefore, while there is agreement that these issues should be regulated, the level of government regulation remains contentious.

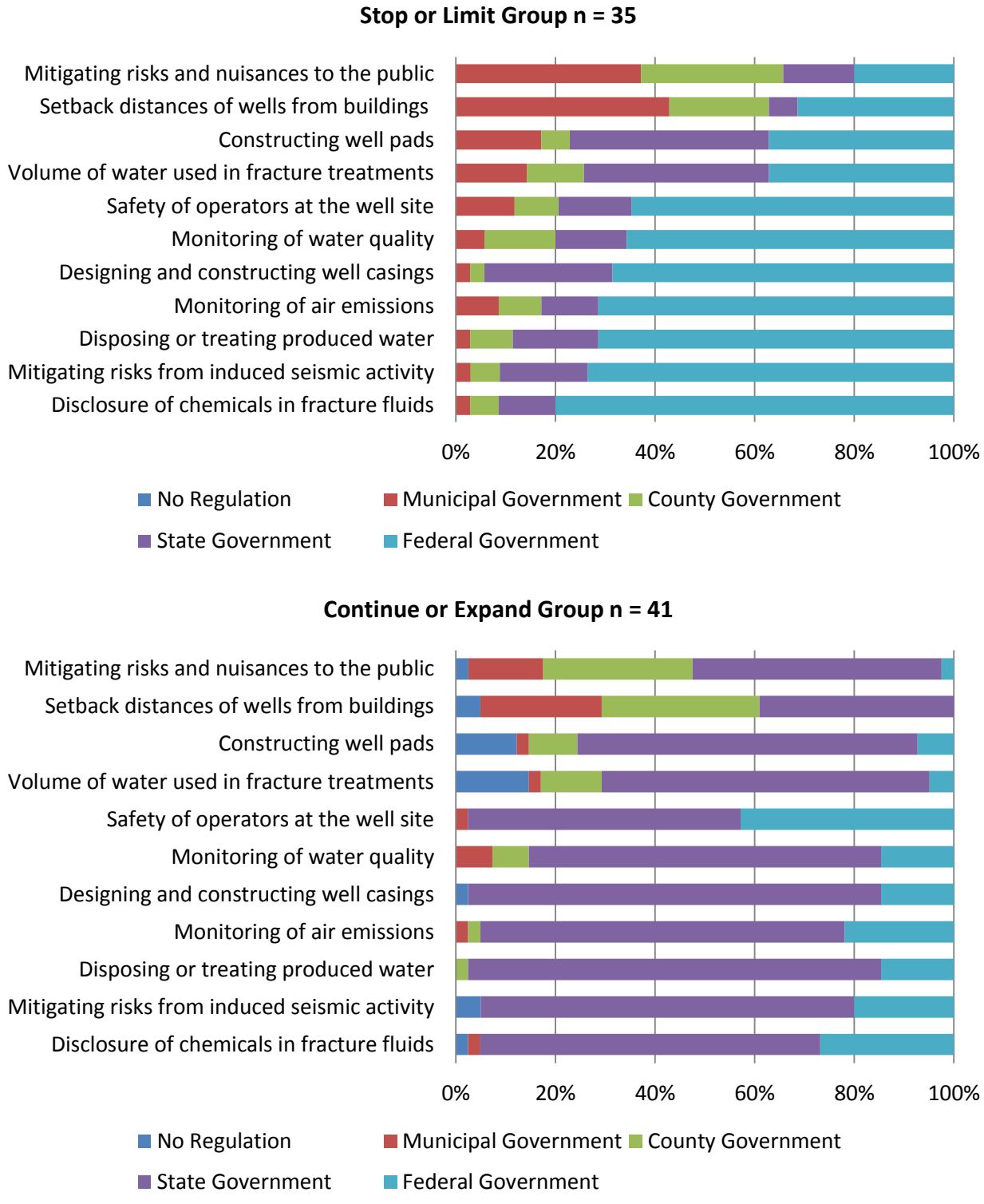

Figure 3. Preferences regarding level of government regulation by position group (n = 76)

Objective 4: To understand the political activities, resources, and network relationships of respondents based on their position toward unconventional shale development.

Political Activities

To understand political advocacy in Texas, we asked respondents to indicate how frequently they engage in 13 different political activities. These political activities were identified through interviews with those directly and indirectly involved in the politics of unconventional shale development in Texas as well as secondary literature on advocacy. Respondents are asked to identify the frequency that they engage in the various political activities on a 0 to 4 scale (from 0 = *never* to 4 = *weekly*). The results are reported as the mean frequency for each position group and absolute differences between the groups in Table 7.

Table 7. Frequency of political activities by position group

	Stop or Limit n = 34	Continue or Expand n = 39	Absolute Difference
Communicating with the news media	2.9	1.9	**1.0**
Posting information or advocating online	2.7	1.4	**1.3**
Forming and maintaining a coalition with allies	2.2	1.7	0.4
Generating and disseminating research and reports	2.1	1.2	**0.9**
Participating in or organizing public meetings	2.0	1.2	**0.8**
Developing policy at the county or municipal levels	1.9	1.0	**1.0**
Providing written comments in response to state agency notices	1.7	1.1	**0.6**
Lobbying elected officials	1.5	1.1	0.4
Formal complaining to regulatory commissions	1.5	0.5	**1.0**
Organizing or participating in public protests or rallies	1.5	0.1	**1.4**
Testifying at state legislative or agency hearings	1.2	1.1	0.2
Participating in regulatory negotiations	0.9	1.2	0.3
Taking legal action (e.g. lawsuits)	0.5	0.4	0.1
Total Means for Frequency of Political Activities	1.7	1.1	**0.7**

0 = Never; 1 = Annually; 2 = Quarterly; 3 = Monthly; 4 = At least weekly

Statistically significant differences between the two position groups are highlighted in bold.

A majority of respondents from both position groups engage in 10 of the 13 political activities at least annually. The exceptions are “Formal complaining to regulatory commissions”, “Organizing or participating in public protests or rallies”, and “Taking legal action (e.g. lawsuits)”. This demonstrates that members of both position groups are politically active in seeking to achieve their objectives in relation to unconventional shale development. In addition, the position groups share three of the most frequent political activities

"Communicating with the news media", "Posting information or advocating online", and "Forming and maintaining a coalition with allies". While the position groups engage in these activities in different frequencies, these are the most frequent political activities of both position groups.

In comparing the two position groups, the *stop or limit group* engages in all activities at a frequency greater than or equal to the *continue or expand group*, except for "Participating in regulatory negotiations" which is not significantly different. For eight of the political activities the *stop or limit group* engages in the activity either monthly or quarterly in comparison to the *continue or expand group* which engages in the activity either quarterly or annually. In addition to this qualitative difference there is also a significant statistical difference in the frequency that respondents from the two position groups engage in these eight political activities. Therefore, while respondents from both position groups engage in a diverse spectrum of political activities, the *stop or limit group* consistently more frequently engages in such activities.

Organizational Capacity

In order to better understand the resources that respondents have they we asked about the capacity of their organizations to use or mobilize nine organizational resources for achieving their objectives related to unconventional shale development in Texas. These resources were identified through interviews with those directly and indirectly involved in the politics of unconventional shale development in Texas as well as secondary literature. Respondents are asked to identify the capacity that their organizations' have to utilize or mobilize these nine resources on a 0 to 3 scale (from 0 = *no capacity* to 3 = *substantial capacity*). The results are reported as the mean capacity for each position group and absolute differences between the groups in Table 8.

Table 8. Mean organizational capacity by position group

	Stop or Limit n = 34	Continue or Expand n = 36	Absolute Difference
Financial resources for paying staff	1.9	1.1	**0.8**
Financial resources for lobbying	1.9	1.0	**0.9**
Support from people with a different position on unconventional shale development	1.7	0.9	**0.8**
Support from the media	1.4	1.2	0.2
Support from government officials	1.4	0.9	**0.5**
Support from members of the general public	1.2	1.1	0.1
Support from members of the organization	1.2	1.0	0.2
Support from people with a similar position on unconventional shale development	1.2	1.0	0.2
Scientific and technical expertise	1.2	0.9	0.3
Total Means for Resources	1.5	1.0	**0.5**

0 = No capacity, 1 = Limited capacity, 2 = Moderate capacity, 3 = Substantial capacity
Statistically significant differences between the two position groups are highlighted in bold.

Both of the position groups report that they have a limited capacity to use or mobilize at least six of the nine resources. This demonstrates that both position groups report that they have relatively the same limited capacity to achieve their objectives. In addition, both groups have little variance in terms of their capacity in relation to use these various resources as the *stop or limit group* has a range of responses from 1.2 to 1.9 (difference of 0.7) and the *continue or expand group* has a range of responses from 0.9 to 1.2 (difference of 0.3).

In comparing the two position groups, the *stop or limit group* has relatively greater capacity to utilize or mobilize every resource, but these differences are only statistically significant for four of the nine resources. Also, in qualitative terms the *stop or limit group* reports have a moderate capacity in comparison to the limited capacity of the *continue or expand group* for the following three resources: “Financial resources for paying staff”, “Financial resources for lobbying”, and “Support from people with a different position on unconventional shale development”. The *stop or limit group* reports that they have significantly greater capacity to utilize financial resources in comparison to the *continue or expand group*. However, it is important to note that this represents relative capacity to utilize such resources, and is not a comparison of absolute financial or other resources between the position groups.

Collaborative Networks

To understand the collaborative networks of actors in Texas, we asked respondents to indicate how frequently they collaborate with 13 different types of organizations in order to achieve their objectives related to unconventional shale development in Texas. This list of

organizations was developed through interviews. Respondents are asked to identify the frequency that they collaborate with each type of organization on a 0 to 3 scale (from 0 = *never* to 3 = *weekly*). The results are reported as the mean frequency for each position group and absolute differences between the groups in Table 9.

Table 9. Mean collaboration frequency of each position group by type of organization

	Stop or Limit n = 32	Continue or Expand n = 36	Absolute Difference
Environmental Organizations	2.3	1.2	**1.1**
Media	2.2	1.3	**0.9**
Organized Citizen Groups	2.2	0.7	**1.5**
Municipal Governments	1.7	0.9	**0.8**
Railroad Commission of Texas	1.3	1.5	0.2
Oil and Gas Industry	1.2	2.0	**0.8**
Texas House of Representatives	1.2	0.9	0.3
Texas State Senate	1.1	1.0	0.1
Mineral Rights Owners	1.0	1.2	0.2
Federal Government	1.0	0.8	0.2
County Commissioner Courts	0.4	0.6	0.2
Texas State Courts	0.3	0.4	0.1
Texas Governor's Office	0.3	0.4	0.1

0 = Never; 1 = Annually; 2 = Monthly; 3 = Weekly.
Statistically significant differences between the two position groups are highlighted in bold.

The two position groups have multiple common patterns in terms of which organizations they do and do not collaborate with. Both position groups tend to collaborate most frequently with organizations of interest groups that belong to their position. In other words, the *stop or limit group* collaborates with environmental organizations and organized citizen groups, but the *continue or expand group* collaborates with the oil and gas industry. The two position groups collaborate at relatively the same frequency with organizations that have authority to regulate unconventional shale development in Texas (for example: Railroad Commission of Texas, and Texas State Legislature). Therefore, both position groups collaborate most frequently with interest groups that have a similar position, and they collaborate at relatively the same frequency with government organizations.

In comparing the frequency of collaboration between the two position groups, there are statistically significant differences for five of the 13 organizations. These include organizations representing competing interest groups as well as the media and municipal governments. In each case, the differences in the frequency of collaboration between the position groups are monthly and annually. It is important to note that the *stop or limit group* more frequently collaborates with the media and municipal governments compared to the *continue or expand group*. The rational for this may warrant further investigation.

Important attributes of collaborators

To further investigate collaboration among respondents, we asked them what factors are important in selecting which organizations you collaborate with to achieve your objectives related to unconventional shale development in Texas. This list of factors was developed based on secondary sources and past surveys. Respondents are asked to identify the importance of each of the eight factors on a scale of 0 to 4 (from 0 = *never* to 4 = *extremely important*). The results are reported as the mean rational for each position group and absolute differences between the groups in Table 10.

Table 10. Mean reported reasons for collaboration by position groups

	Stop or Limit n = 32	Continue or Expand n = 38	Absolute Difference
They are professionally competent	3.3	3.4	0.1
I trust them to keep their promises	3.1	3.0	0.1
They share my position about major issues	2.3	1.6	**0.7**
I have worked with them in the past	2.0	1.7	0.3
They have access to human resources	2.0	1.5	0.5
We share a common opponent	2.0	0.8	**1.2**
They have political influence	1.9	1.6	0.3
They have access to financial resources	1.6	1.1	**0.5**

0 = Not important, 1 = Somewhat important, 2= Moderately important, 3= Very important, 4 = Extremely important.
Statistically significant differences between the two position groups are highlighted in bold.

The two position groups report the same two reasons as the most important for collaborating with other organizations. These are: “They are professionally competent” and “I trust them to keep their promises”. Therefore, being competent and trustworthy as an organization is very important for collaboration. In addition, both position groups report that relatively having financial and political resources are the least important factors when determining whether to collaborate with an organization.

In comparing the two position groups there are few differences in their rationale for collaboration. The factors that are statistically different are: “They share my position about major issues”, “We share a common opponent”, and “They have access to financial resources”. The greatest difference between the position groups is about having a common opponent. This factor is moderately important for the *stop or limit group,* but only somewhat important for the *continue or expand group*. It is evident that beliefs about unconventional shale development are a more important factor for the *stop or limit group* than beliefs are for the *continue or expand group.*

Conclusions

This report presents the findings of a 2014 survey administered to people directly and indirectly involved in unconventional shale development in Texas. It focuses on four objectives related to the beliefs and strategies of the respondents. The findings in relation to each objective are summarized below.

Objective 1: To identify respondents' general positions about hydraulic fracturing used in unconventional shale development in Texas. The findings show that respondents can be grouped according to their position about whether hydraulic fracturing should be stopped or limited (n = 35) or continued at the current rate or expanded (n = 43). These two position groups are used to guide the analysis for the remaining objectives. The majority of environmental and all of the organized citizen groups are a part of the *stop or limit group*. In contrast, the oil and gas industry and state and local governments make up the majority of respondents in the *continue or expand group*. Academics, consultants, and members of the news media are split between the two groups.

Objective 2: To understand the extent that respondents perceive potential problems and benefits associated with unconventional shale development. Potential problems related to pollution, health risks or environmental degradation, and politics are perceived as more severe by the *stop or limit group* than by the *continue or expand group.* In addition, the two groups have different views of the potential benefits of unconventional shale development. The *continue or expand group* agrees that there are economic and environmental benefits from unconventional shale development, while the *stop or limit group* neither agrees nor disagrees about the economic benefits and perceives environmental risks.

Objective 3: To assess respondents' evaluation of recent rules and their preferences for the role of government in unconventional shale development. The *stop or limit group* is unsatisfied that the 2011 chemical disclosure and the 2013 well casing rules resolved the issues they were intended to address. In contrast, the *continue or expand group* is satisfied with these two rules. However, one issue both groups agree that has not been resolved by these rules is public distrust of the oil and gas industry. The majority of both position groups support regulation in some form. There is also general agreement that local governments should regulate setback distances and public nuisance issues. However, the *continue or expand group* on most issues supports state government regulation of unconventional shale development, but the *stop or limit group* tends to prefer federal regulation.

Objective 4: To understand the political activities, resources, and network relationships of respondents based on their position toward unconventional shale development. The political activities that respondents most frequently engage in to influence politics and policy related to unconventional shale development are communicating with the news media, generating and disseminating research and reports, and participating in public meetings. Across almost all activities, respondents from the *stop or limit group* are more politically active. The resource that respondents of both groups have the greatest capacity to utilize is financial resources. The *stop or*

limit group's reports moderate capacity for most resources and the *continue or expand group* reports limited capacity for most resources. The two position groups most frequently collaborate with interest groups that share their position and least frequently with courts and the Texas Governors' Office. *The* most important attribute for selecting with whom to collaborate with by both position groups are professional competency and trust. The least important characteristic sought in a collaborator by the respondents is financial resources.

Table 11 summarizes the areas of substantial agreement and disagreement between the two position groups. In general, the areas of disagreement are about the potential political, environmental and public health problems related to unconventional shale development, except for the agreement that public distrust of the oil and gas industry is an issue. There is also disagreement about the potential benefits of the practice. Therefore, those who oppose the practice believe it is harmful for the environment and public health, while those who support the practice believe it is not harmful and may possess potential economic and environmental benefits.

Another area of disagreement between the two positions was whether the 2011 disclosure and the 2013 well casings rules resolved various issues. The two groups disagree on whether these two rules resolved the issues they were supposed to address except for distrust of the oil and gas industry, which both groups agree continues to be an issue. They agree that unconventional shale development should be regulated, but for the majority of issues the two groups do not agree which level of government should be regulating the practice. Both sides prefer local government regulation for setback distances and public nuisance issues, and both support a role for the federal government in ensuring the safety of operators at well sites. However, there is disagreement about the role of state regulation on other issues as opponents of unconventional development tend to favor federal regulation of the practice. In the final analysis, the two positions in relation to unconventional shale development in Texas diverge on their beliefs in general about the potential problems, benefits, evaluation of past regulations, and preferences on level of government regulation, but they do have some specific areas of common ground.

Table 11. Areas of substantial agreement and disagreement between position groups

Areas of Substantial Agreement		Areas of Substantial Disagreement
Potential Environmental and Public Health Problems		
None		• Contamination of ground and surface water, degradation of air quality, disposing or treating produced water
Potential Political Problems		
• Public distrust of the oil and gas industry		• Scare tactics used by those who oppose the practice • Insufficient regulatory capacity by the state • Conflict between landowners and their neighbors
Potential Benefits		
None		• Benefits to local landowners • Natural gas is a bridge towards renewable energy • Mitigation of climate change from natural gas
Evaluation of resolution of issues by 2011 Chemical Disclosure Rule		
• Public distrust of the oil and gas industry continues		• What chemical information must be disclosed • Accessibility of chemical information to the public • How trade secrets are protected and challenged • Groundwater protection
Evaluation of resolution of issues by 2013 Well Casings Rule		
• Public distrust of the oil and gas industry continues		• Groundwater protection • Effective control of the well by operator at all times • Long-term well integrity
Preferred Level of Government Regulation		
• Local government regulation of setback distances and mitigating public nuisance issues • Federal government regulation for ensuring safety of operators at well site		• Federal versus state government regulation of several items: risks from induced seismic activity, constructing well pads, disposing of treated water, constructing well casings, disclosure, monitoring air and water contamination

The goal of this study is to help clarify the positions, beliefs, preferences, strategies, resources and collaborative ties of a diverse range of actors in Texas. This survey offers only a

partial representation of the politics and policy process of unconventional shale development at a specific point in time and it does not extrapolate to the beliefs and preferences of the general public in Texas. However, we hope to offer interested individuals and organizations a better understanding of one of the most controversial and intractable energy and environmental debates in Texas and nationally.

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Appendix. Survey Questions

1. Please indicate to what extent you perceive the following issues to be potential benefits of unconventional shale development.

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
National energy independence	❍	❍	❍	❍	❍
Growth of the Texas economy through jobs and tax revenue	❍	❍	❍	❍	❍
A bridge toward renewable energy sources from the natural gas produced	❍	❍	❍	❍	❍
Mitigation of climate change from the natural gas produced	❍	❍	❍	❍	❍
Benefits to local landowners in Texas	❍	❍	❍	❍	❍

2. Please indicate to what extent you perceive the following issues as potential problems related to unconventional shale development.

	Not a Problem	Minor Problem	Moderate Problem	Serious Problem	Severe Problem
Insufficient capacity by state agencies for regulation	❍	❍	❍	❍	❍
Conflict between landowners and their neighbors	❍	❍	❍	❍	❍
Contamination of ground and surface water supplies from the injection of hydraulic fracturing fluids	❍	❍	❍	❍	❍
Public distrust of the oil and gas industry	❍	❍	❍	❍	❍
Degradation of air quality from flaring, diesel exhaust, and dust from well site operations	❍	❍	❍	❍	❍
Nuisance to the general public caused by truck traffic, noise, and light from well site operations	❍	❍	❍	❍	❍
Scare tactics and demonizing of hydraulic fracturing by those who oppose the practice	❍	❍	❍	❍	❍
Competition over available water supplies	❍	❍	❍	❍	❍
Disposing or treating produced water	❍	❍	❍	❍	❍
Induced seismic activity	❍	❍	❍	❍	❍

3. Please indicate what comes closest to your current position in relation to unconventional shale development that uses hydraulic fracturing. It should be...

- ❍ Stopped
- ❍ Limited
- ❍ Continued at Current Rate
- ❍ Expanded Moderately
- ❍ Expanded Extensively

4. When you first became aware of unconventional shale development, what was your position on the following issues?

	Strongly Disagreed	Disagreed	Neither	Agreed	Strongly Agreed
The potential economic benefits are significant	❍	❍	❍	❍	❍
The potential public health risks are severe	❍	❍	❍	❍	❍
The potential environmental risks are severe	❍	❍	❍	❍	❍
Local governments should be able to decide if and where drilling occurs in their jurisdiction	❍	❍	❍	❍	❍

5. Today, what is your position on the following issues?

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
The potential economic benefits are significant	❍	❍	❍	❍	❍
The potential public health risks are severe	❍	❍	❍	❍	❍
The potential environmental risks are severe	❍	❍	❍	❍	❍
Local governments should be able to decide if and where drilling occurs in their jurisdiction	❍	❍	❍	❍	❍

6. If you were to select only one level of government to regulate the following issues related to shale development, which would you prefer, if any?

	No Regulation	Municipal Government	County Government	State Government	Federal Government
Monitoring of water quality	❍	❍	❍	❍	❍
Monitoring of air emissions	❍	❍	❍	❍	❍
Disclosure of chemicals in hydraulic fracturing fluids	❍	❍	❍	❍	❍
Volume of water used in hydraulic fracturing treatments	❍	❍	❍	❍	❍
Setback distances of wells from occupied buildings or natural features	❍	❍	❍	❍	❍
Designing and constructing well casings	❍	❍	❍	❍	❍
Disposing or treating produced water	❍	❍	❍	❍	❍
Constructing well pads	❍	❍	❍	❍	❍
Mitigating risks from induced seismic activity	❍	❍	❍	❍	❍
Mitigating risks and nuisances to the general public caused by truck traffic, noise, and light from well site operations	❍	❍	❍	❍	❍
Safety of operators at the well site	❍	❍	❍	❍	❍
Other	❍	❍	❍	❍	❍

7. In 2011 the Texas State Legislature enacted and the Railroad Commission of Texas promulgated a disclosure law and rule with the intention to address some of the following issues. To what extent do you agree that these issues have been resolved by the final **Disclosure Rule of 2011**?

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
What chemical information must be disclosed	❍	❍	❍	❍	❍
Accessibility of chemical information to the public	❍	❍	❍	❍	❍
Groundwater protection	❍	❍	❍	❍	❍
How trade secrets are protected and challenged	❍	❍	❍	❍	❍
Public distrust of the oil and gas industry	❍	❍	❍	❍	❍

8. In 2013 the Texas Railroad Commission completed a rule making process to update **Rule 3.13, relating to Casing, Cementing, Drilling and Completion Requirements**. To what extent do you agree that the following issues have been resolved by the updated Rule 3.13

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
Effective control of the well by the operator at all times	❍	❍	❍	❍	❍
Groundwater protection	❍	❍	❍	❍	❍
Long-term well integrity	❍	❍	❍	❍	❍
Public distrust of the oil and gas industry	❍	❍	❍	❍	❍

9. How often has your organization engaged in the following activities for achieving its objectives in unconventional shale development in Texas?

	At Least Weekly	Monthly	Quarterly	Annually	Never
Communicating with the news media	❍	❍	❍	❍	❍
Formal complaining to regulatory commissions	❍	❍	❍	❍	❍
Lobbying elected officials	❍	❍	❍	❍	❍
Forming and maintaining a coalition with allies	❍	❍	❍	❍	❍
Posting information or advocating online	❍	❍	❍	❍	❍
Generating and disseminating research and reports	❍	❍	❍	❍	❍
Providing written comments in response to state agency notices	❍	❍	❍	❍	❍
Participating in or organizing public meetings	❍	❍	❍	❍	❍
Testifying at state legislative or agency hearings	❍	❍	❍	❍	❍
Participating in regulatory negotiations	❍	❍	❍	❍	❍
Taking legal action (e.g. lawsuits)	❍	❍	❍	❍	❍
Organizing or participating in public protests or rallies	❍	❍	❍	❍	❍
Developing policy at the county or municipal levels	❍	❍	❍	❍	❍
Other	❍	❍	❍	❍	❍

10. Since 2008, how influential has your organization been in politics and policy about unconventional shale development in Texas?

- ❍ Not Influential
- ❍ Somewhat Influential
- ❍ Extremely Influential

11. To what extent does your organization have the capacity to use or mobilize the following resources to achieve its objectives in relation to unconventional shale development in Texas?

	No Capacity	Limited Capacity	Moderate Capacity	Substantial Capacity	Not Applicable
Financial resources for lobbying	❍	❍	❍	❍	❍
Financial resources for paying staff	❍	❍	❍	❍	❍
Support from members of the organization	❍	❍	❍	❍	❍
Support from members of the general public	❍	❍	❍	❍	❍
Support from government officials	❍	❍	❍	❍	❍
Scientific and technical expertise	❍	❍	❍	❍	❍
Support from people with a different position on unconventional shale development	❍	❍	❍	❍	❍
Support from people with a similar position on unconventional shale development	❍	❍	❍	❍	❍
Support from the media	❍	❍	❍	❍	❍
Other	❍	❍	❍	❍	❍

12. In general, what factors are important in choosing which organization(s) you collaborate with on issues related to unconventional shale development in Texas?

	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
They share my position about major issues	❍	❍	❍	❍	❍
I trust them to keep their promises	❍	❍	❍	❍	❍
They are professionally competent	❍	❍	❍	❍	❍
I have worked with them in the past	❍	❍	❍	❍	❍
They have access to financial resources	❍	❍	❍	❍	❍
They have political influence	❍	❍	❍	❍	❍
They have access to human resources	❍	❍	❍	❍	❍
We share a common opponent	❍	❍	❍	❍	❍
Other	❍	❍	❍	❍	❍

13. Since 2008, please indicate how frequently you engage with the following organizations to achieve your political and policy goals related to unconventional shale development in Texas

	Weekly	Monthly	Yearly	Never
Federal Government	❍	❍	❍	❍
The Railroad Commission of Texas	❍	❍	❍	❍
Texas Governor's Office	❍	❍	❍	❍
Texas House of Representatives	❍	❍	❍	❍
Texas State Courts	❍	❍	❍	❍
County Commissioner Courts	❍	❍	❍	❍
Municipal Governments	❍	❍	❍	❍
Oil and Gas Industry	❍	❍	❍	❍
Environmental Organizations	❍	❍	❍	❍
Organized Citizen Groups	❍	❍	❍	❍
Mineral Rights Owners	❍	❍	❍	❍
Media	❍	❍	❍	❍
Texas State Senate	❍	❍	❍	❍
Other	❍	❍	❍	❍

14. The following statements reflect general attitudes. Please indicate whether you agree or disagree with each statement.

	Strongly Disagree	Moderately Disagree	Moderately Agree	Strongly Agree
It is not the government's business to try to protect people from themselves.	❍	❍	❍	❍
We need to dramatically reduce inequalities between the rich and the poor, as well as between men and women.	❍	❍	❍	❍
The government should do more to advance society's goals, even if that means limiting the freedom and choices of individuals.	❍	❍	❍	❍
It is not enough to provide equal opportunities; we also have to try to make outcomes more equal.	❍	❍	❍	❍
Sometimes government needs to make laws that keep people from hurting themselves.	❍	❍	❍	❍
Our society would be better off if the distribution of wealth were more equal.	❍	❍	❍	❍
The government interferes far too much in our everyday lives.	❍	❍	❍	❍
The government should stop telling people how to live their lives.	❍	❍	❍	❍
Government should put limits on the choices individuals can make so they do not get in the way of what is good for society.	❍	❍	❍	❍
Most of the important things that take place in life happen by random chance.	❍	❍	❍	❍
No matter how hard we try, the course of our lives is largely determined by forces beyond our control.	❍	❍	❍	❍
For the most part, succeeding in life is a matter of chance.	❍	❍	❍	❍

15. Please indicate your gender.
- ❍ Male
- ❍ Female

16. Please indicate your age.
- ❍ 18-29
- ❍ 30-39
- ❍ 40-49
- ❍ 50-59
- ❍ 60 or older

17. Please indicate the highest level of education you have attained
- ❍ Not a High School Graduate
- ❍ High School Graduate
- ❍ Some College
- ❍ Bachelor's Degree
- ❍ Master's or Professional Degree
- ❍ Ph.D. or M.D.

18. How many years have you been involved in unconventional shale development?
- ❍ 0-1 years
- ❍ 2-4 years
- ❍ 5-9 years
- ❍ 10-20 years
- ❍ 21 or more years

19. On average, how many hours per week do you spend on issues related to unconventional shale development?
- ❍ Less than 9 hours
- ❍ 10-20 hours
- ❍ 21-30 hours
- ❍ 31-40 hours
- ❍ More than 40 hours

20. On average, how many hours per week do you spend on the policy and/or politics related to unconventional shale development?
- ❍ Less than 9 hours
- ❍ 10-20 hours
- ❍ 21-30 hours
- ❍ 31-40 hours
- ❍ More than 40 hours

21. If you have any additional thoughts, considerations, or opinions you would like to share with us about unconventional shale development please provide them below.

22. If you would like a copy of the final report, please provide your email. Your email will never be distributed or shared.

Thank you for your time and responses!